ISSN 0354–7256
HI–N–31

Godina LXV

NAUTIČKI GODIŠNJAK

ZA

2008

GODINU

UPRAVA ZA POMORSKU SIGURNOST CRNE GORE
BAR – CRNA GORA

UKUPNA POPRAVKA VISINE

PRVA POPRAVKA VISINE
ZA SUNCE, ZVEZDE I PLANETE

Opažena visina	⊙ refrakcija paralaksa radijus = 16′	★ i planeta refrakcija
° ′	′	′
6 30	+ 8.2	- 7.9
6 40	8.4	7.7
6 50	8.6	7.6
7 00	8.7	7.4
7 10	8.9	7.2
7 20	+ 9.0	- 7.1
7 30	9.2	7.0
7 40	9.3	6.8
7 50	9.5	6.7
8 00	9.6	6.6
8 10	+ 9.7	- 6.4
8 20	9.8	6.3
8 30	10.0	6.2
8 40	10.1	6.1
8 50	10.2	6.0
9 00	+ 10.3	- 5.9
9 20	10.5	5.7
9 40	10.6	5.5
10 00	10.8	5.3
10 20	11.0	5.2
10 40	+ 11.2	- 5.0
11 00	11.3	4.9
11 30	11.5	4.7
12 00	11.7	4.5
12 30	11.9	4.3
13 00	+ 12.0	- 4.1
13 30	12.2	4.0
14 00	12.3	3.8
15 00	12.6	3.6
16 00	12.8	3.4
17 00	+ 13.0	- 3.2
18 00	13.2	3.0
19 00	13.3	2.8
20 00	13.5	2.6
22 00	13.7	2.4
24 00	+ 14.0	- 2.2
26 00	14.1	2.0
28 00	14.3	1.8
30 00	14.4	1.7
32 00	14.6	1.6
34 00	+ 14.7	- 1.4
36 00	14.8	1.3
38 00	14.9	1.3
40 00	15.0	1.2
50 00	15.3	0.8
60 00	+ 15.5	- 0.6
70 00	15.7	0.4
80 00	15.8	0.2
90 00	16.0	0.0

DRUGA POPRAVKA VISINE
ZA VISINU OKA

Visina oka	depresija	Visina oka	depresija
metara	′	metara	′
0.5	- 1.3	18	- 7.5
1.0	1.8	19	7.7
1.5	2.2	20	7.9
2.0	2.5	21	8.1
8.5	2.8	22	8.3
3.0	- 3.1	23	- 8.5
3.5	3.3	24	8.7
4.0	3.5	25	8.9
4.5	3.8	26	9.0
5.0	3.9	27	9.2
5.5	- 4.1	28	- 9.4
6.0	4.3	29	9.6
6.5	4.5	30	9.7
7.0	4.7	50	12.6
7.5	4.9	75	15.4
8.0	- 5.0	100	- 17.7
8.5	5.2	125	19.9
9.0	5.3	150	21.8
9.5	5.4	175	23.5
10.0	5.6	200	25.1
11.0	- 5.9	250	- 28.1
12.0	6.1	300	30.8
13.0	6.4	350	33.2
14.0	6.5	400	35.5
15.0	6.9	450	37.7
16.0	- 7.1	500	- 39.7
17.0	7.3	600	43.5

TREĆA POPRAVKA VISINE
ZA VISINU PLANETE S OBZIROM NA PARALAKSU

Opažena visina planete	Horizontska paralaksa					
	′ 0.1	′ 0.2	′ 0.3	′ 0.4	′ 0.5	′ 0.6
°	′	′	′	′	′	′
10	0.1	0.2	0.3	0.4	0.5	0.6
30	0.1	0.2	0.3	0.3	0.4	0.5
50	0.1	0.1	0.2	0.3	0.3	0.4
70	0.0	0.1	0.1	0.2	0.2	0.2

TREĆA POPRAVKA VISINE
ZBOG PARALAKSE I PROMENE RADIJUSA SUNCA

	Jan.	Feb.	Mart	Apr.	Maj	Jun	Jul	Avg.	Sep.	Okt.	Nov.	Dec.
	′	′	′	′	′	′	′	′	′	′	′	′
od 1. do 15.	+0.3	+0.2	+0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	+0.1	+0.2	+0.3
od 16. do kraja	+0.3	+0.2	+0.1	-0.1	-0.2	-0.2	-0.2	-0.2	0.0	+0.1	+0.2	+0.3

$\overline{\odot}$ Za *gornji rub Sunca* korekcija = tablična vrednost *manje* dvostruki radijus (2r)

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Prof. Dr STEVO ŠEGAN

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SLOG:
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ŠTAMPA: STUDIO PLUS, Beograd

POVEZ: STUDIO PLUS, Beograd

TIRAŽ:
150 PRIMERAKA

ADRESA IZDAVAČA:
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MARŠALA TITA 7, 85000 BAR

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SADRŽAJ

var = promenljivi deo Nautičkog godišnjaka
const = stalni deo Nautičkog godišnjaka

PREDGOVOR

Uprava za pomorsku sigurnost Crne Gore iz Bara izdaje svoj drugi broj NAUTIČKOG GODIŠNJAKA, koji je četrnaesti u jednom drugom nizu i šezdesetipeti u ukupnom nizu izdanja ove publikacije na našim prostorima.

Za šezdesetipet brojeva Nautičkog godišnjaka, do sada, možemo zahvaliti jednoj maloj armiji ljudi, entuzijasta i naučnika, koji su dali svoj nesebični doprinos da ova publikacija bude prisutna među pomorcima Kraljevine Jugoslavije, Socijalističke Jugoslavije, Saveza Republika Srbije i Crne Gore, a sada i samo Crne Gore.

Put je išao preko preuzimanja ruskih Nautičkih godišnjaka, koji su prevođeni na naš jezik i kada su ručno ukucavane brojevne vrednosti efemerida, tablica popravki i svih ostalih delova Godišnjaka, do današnje računarske obrade podataka.

Od 1983. godine, zahvaljujući prof. dr Stevi Šeganu, počelo se sa računarskom obradom Nautičkog godišnjaka.

Algoritme i softver za potrebna izračunavanja, kao i računarsku pripremu za štampu i za ovaj broj, kao i za prethodnih dvadeset dva, izvršio je prof. dr Stevo Šegan, profesor na Katedri za astronomiju Matematičkog fakulteta u Beogradu.

Svi podaci potrebni za navigaciju izračunati su polazeći od heliocentričnih pravouglih koordinata nebeskih tela za standardnu epohu J2000.0, a izračunavanja su usklađena sa preporukama i rešenjima Međunarodne astronomske unije (IAU 1976–1983 i XXIV GA 2000). Takvim postupkom osigurana je maksimalna tačnost u današnje vreme.

Podaci u Nautičkom godišnjaku izračunati su i prerađeni isključivo za potrebe astronomske navigacije.

Godišnjak se sastoji iz dva dela—*efemeridskog* (var) i *stalnog* (const). Efemeridski deo sadrži efemeride Sunca, Meseca, četiri velike planete (Venere, Marsa, Jupitera i Saturna) i pedeset četiri najsjajnije (nautičke) zvezde za celu godinu i tablice za određivanje geografske širine pomoću visine i azimuta Severnjače. Stalni deo Godišnjaka sadrži interpolacione i pomoćne tablice.

Svi vremenski podaci u Nautičkom godišnjaku odnose se na Grinički meridijan. Prema tome, argument u svim efemeridama je univerzalno vreme, koje se računa od ponoći ($00^h.00$).

Tačnost astronomskih podataka data je u ugaonoj meri od jedne desetine minuta, u vremenskoj skali od jedne sekunde, odnosno, gde je to bilo potrebno, do jedne desetine sekunde. Podaci izračunati u interpolacionim tablicama imaju približno istu tačnost.

Izbor i sastav efemerida ostao je neizmenjen i u ovom izdanju. Raspored efemerida je, kao i ranije, po datumima, po dva na svakoj stranici. Efemeride zvezda i tablice za izračunavanje geografske širine pomoću visine i azimuta Severnjače izdvojene su posebno. Interpolacione tablice, zajedničke za ispravke časovnog ugla i deklinacije, takođe su date posebno.

Sve primedbe, koje smo dobili nakon izlaženja prethodnih brojeva, ukoliko se pokazalo da su tačne, uvažili smo.

Molimo da nam i u buduće dostavite, eventualne i opravdane primedbe i ispravke, koje ćemo, sa punim uvažavanjem, razmotriti.

KATEDRA ZA ASTRONOMIJU
UNIVERZITETA U BEOGRADU

PROF. DR STEVO ŠEGAN

DIREKTOR
UPRAVE ZA POMORSKU SIGURNOST CRNE GORE

KAPETAN DUGE PLOVIDBE
KRSTO RAKOČEVIĆ

ASTRONOMSKI ZNACI, SKRAĆENICE I KONSTANTE

NAŠI I ENGLESKI NAZIVI ZA ZNAKOVE
Domestic and English Names for Symbols

☉	Sunce	The Sun
☾	Mesec	The Moon
★	Zvezda	A Star
♀	Venera	Venus
♂	Mars	Mars
♃	Jupiter	Jupiter
♄	Saturn	Saturn
♈	Prolećna tačka	First Point of Aries
●	Mlad Mesec	New Moon
◐	Prva četvrt	First Quarter
○	Pun Mesec	Full Moon
◑	Poslednja četvrt	Last Quarter
°	Stepen	Degree
′	Minut (luka)	Minute of Arc
″	Sekunda (luka)	Second of Arc

OPŠTI ASTRONOMSKI ZNACI

☉	Sunce	♅	Uran
☾	Mesec	♆	Neptun
☿	Merkur	♇	Pluton
♀	Venera	☄	Kometa
♁	Zemlja	●	Mlad Mesec
♂	Mars	◐	Prva četvrt
♃	Jupiter	○	Pun Mesec
♄	Saturn	◑	Poslednja četvrt

SKRAĆENICE

d	dan	vremena
h	čas	
min	minut	
s	sekunda	
°	stepen	ugla
′	minut	
″	sekunda	
+	severne geografske širine i deklinacije; istočne geografske dužine	
−	južne geografske širine i deklinacije; zapadne geografske dužine	

ZODIJAČKI ZNACI I SAZVEŽĐA

♈	Ovan	Aries
♉	Bik	Taurus
♊	Blizanci	Gemini
♋	Rak	Cancer
♌	Lav	Leo
♍	Devojka	Virgo
♎	Vaga	Libra
♏	Škorpija	Scorpius
♐	Strelac	Sagittarius
♑	Jarac	Capricornus
♒	Vodolija	Aquarius
♓	Ribe	Pisces

♈ ... Prolećna tačka
♎ ... Jesenja tačka

OSNOVNE ASTRONOMSKE KONSTANTE
IAU(1976) XXIV(2000)

DEFINICIONE KONSTANTE

Gausova gravitaciona konstanta	$k = 0.017\,202\,098\,95$
Brzina svetlosti	$c = 299\,792\,458\,m/s$

OSNOVNE KONSTANTE

Svetlosno vreme	$\tau_A = 499.004\,786\,s$
Ekvatorski poluprečnik Zemlje	$a_e = 6\,378\,137\,m$
Dinamički faktor oblika Zemlje	$J_2 = 0.001\,082\,64$
Geocentrična gravitaciona konstanta	GE=$3.986\,004 \times 10^{14}\,m^3/s^2$
Konstanta gravitacije	G=$6.673 \times 10^{-11}\,m^3/kg\,s^2$
Masa Meseca u jedinicama mase Zemlje	$\mu = 0.012\,300\,04$
Opšta precesija u longitudi, za Julijansko stoleće	$\rho = 5029''.7970$
Nagib ekliptike	$\varepsilon = 23°26'21''.448$

IZVEDENE KONSTANTE

Konstanta nutacije	$N = 9''.2052$
Jedinica rastojanja (astronomska jed.)	$c\tau_A$ =A=$1.495\,978\,71 \times 10^{11}\,m$
Paralaksa Sunca	$\arcsin(a_e/A) = \pi_\odot = 8''.794\,143$
Konstanta aberacije	$\varkappa = 20''.495\,51$
Faktor Zemljine spljoštenosti	$f = 0.003\,352\,82 = 1/298.256$
Heliocentrična gravitaciona konstanta	$GS = 1.327\,124\,42 \times 10^{20}\,m^3/s^2$
Masa Sunca u jedinicama mase Zemlje	$GS/GE = S/E = 332\,946.0$
Masa Sunca	$GS/G = S = 1.9884 \times 10^{30}\,kg$
Relativne mase planeta:	
Merkur	6 023 600
Venera	408 523.7
Zemlja+Mesec	328 900.6
Mars	3 098 708
Jupiter	1 047.349
Saturn	3 497.9
Uran	22 903
Neptun	19 412
Pluton	135 200 000

NAŠE I ENGLESKE SKRAĆENICE I KLJUČNE REČI

Domestic and English Abbreviations and Key Words

UT	Univerzalno (svetsko) vreme	**UT**	Universal Time
$\mathbf{T_p}$	Griničko pravo vreme	**GAT**	Greenwich Apparent Time
$\mathbf{T_z}$	Griničko zvezdano vreme	**GST**	Greenwich Sidereal Time
$\mathbf{T_{\overline{m}}}$	Srednje vreme gornjeg prolaza kroz meridijan u Griniču	$\mathbf{T_{\bar{r}}}$	Greenwich Mean Time of the Upper Transit on the Meridian of Greenwich
$\mathbf{T_{\underline{m}}}$	Srednje vreme donjeg prolaza kroz meridijan u Griniču	$\mathbf{T_{\underline{r}}}$	Greenwich Mean Time of the Lower Transit on the Meridian of Greenwich
$\mathbf{t_s}$	Mesno srednje vreme	**LMT**	Local Mean Time
$\mathbf{t_p}$	Mesno pravo vreme	**LAT**	Local Apparent Time
$\mathbf{t_z}$	Mesno zvezdano vreme	**LST**	Local Sidereal Time
$\mathbf{t_x}$	Zonsko vreme	**ZT**	Zone Time
$\mathbf{t_{zv}}$	Zvanično vreme	**LCT**	Local Civil Time
e	Jednačina vremena	**Eq.T.**	Equation of Time (App.-Mean)
S	Grinički časovni ugao	**GHA**	Greenwich Hour Angle
s	Mesni časovni ugao	**LHA**	Local Hour Angle, Meridian Angle
δ	Deklinacija	**Dec.**	Declination
α	Rektascenzija	**RA**	Right Ascension
$(\mathbf{360}^\circ - \alpha)$	Surektascenzija	**SHA**	Sidereal Hour Angle
Υ	Prolećna tačka	Υ	First Point of Aries
π	Horizontska paralaksa	**H.P.**	Horizontal Parallax
φ	Geografska širina	**Lat.**	Latitude
λ	Geografska dužina	**Long.**	Longitude
r	Poluprečnik	**SD**	Semidiameter
Pl.	Planete	**Pl.**	Planets
Br.	Broj	**No.**	Number
Vel.	Veličina	**Mag.**	Magnitude
d	Dan	**d**	Day
h	Čas	**h**	Hour
min	Minut	**min**	Minute of Time
s	Sekunda	**s**	Second of Time

PODACI O MESECU I POČETKU GODIŠNJIH DOBA

MESEČEVE MENE

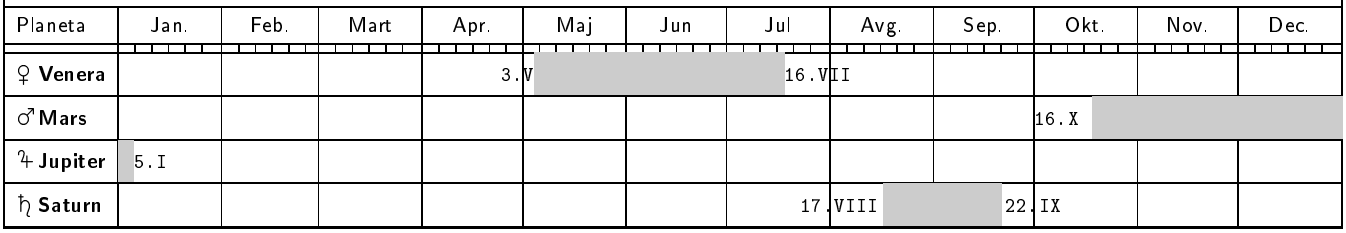
mesec	MLAD MESEC				PRVA ČETVRT				PUN MESEC				POSLEDNJA ČETVRT				mesec
	●			●			◐		○			○	◑			◑	
	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	dan	h	min	
Januar	8	11	37				15	19	46				22	13	35				30	5	03				Januar
Februar	7	3	44				14	3	33				21	3	30				29	2	18				Februar
Mart	7	17	14				14	10	46				21	18	40				29	21	47				Mart
April	6	3	55				12	18	32				20	10	25				28	14	12				April
Maj	5	12	18				12	3	47				20	2	11				28	2	57				Maj
Jun	3	19	23				10	15	4				18	17	30				26	12	10				Jun
Jul	3	2	19				10	4	35				18	7	59				25	18	42				Jul
Avgust	1	10	13	30	19	58	8	20	20				16	21	16				23	23	50				Avgust
Septembar				29	8	12	7	14	4				15	9	13				22	5	4				Septembar
Oktobar				28	23	14	7	9	4				14	20	2				21	11	55				Oktobar
Novembar				27	16	55	6	4	3				13	6	17				19	21	31				Novembar
Decembar				27	12	22	5	21	26				12	16	37				19	10	29				Decembar

PERIGEJ I APOGEJ MESECA

mesec	PERIGEJ							APOGEJ						mesec
	dan	h	min	dan	h	min		dan	h	min	dan	h	min	
Januar	19	8	40.0					3	8	7.0	31	4	27.0	Januar
Februar	14	1	9.0								28	1	28.0	Februar
Mart	10	21	40.0								26	20	14.0	Mart
April	7	19	30.0								23	9	35.0	April
Maj	6	3	23.0								20	14	29.0	Maj
Jun	3	13	9.0								16	17	34.0	Jun
Jul	1	21	23.0	29	23	25.0					14	4	15.0	Jul
Avgust				26	3	45.0					10	20	19.0	Avgust
Septembar				20	3	18.0					7	14	59.0	Septembar
Oktobar				17	6	7.0					5	10	35.0	Oktobar
Novembar				14	10	0.0		29	16	56.0	2	4	56.0	Novembar
Decembar				12	21	38.0		26	17	51.0				Decembar

VIDLJIVOST PLANETA

Osenčeni deo dijagrama pokazuje kada je planeta nevidljiva



POČECI GODIŠNJIH DOBA

PROLEĆE	LETO	JESEN	ZIMA
20. mart u $5^h\,48^m.0$	20. jun u $23^h\,59^m.0$	22. septembar u $15^h\,44^m.0$	21. decembar u $12^h\,4^m.0$

POMRAČENJA SUNCA I MESECA

u 2008. godini

DESIĆE SE UKUPNO ČETRI POMRAČENJA:
JEDNO PRSTENASTO I JEDNO POTPUNO POMRAČENJE SUNCA
JEDNO POTPUNO I JEDNO DELIMIČNO POMRAČENJE MESECA

1.	7. FEBRUAR	PRSTENASTO POMRAČENJE SUNCA	univerzalno (svetsko) vreme dan h min
•	→	POČETAK POMRAČENJA	7 1 38.5
••••	⇉	SREDINA POMRAČENJA	7 3 55.3
•	→	KRAJ POMRAČENJA	7 6 11.9
		VIDLJIVOST: ANTARKTIK, ISTOČNA AUSTRALIJA, JUGOZAPAD TIHOG OKEANA	

2.	21. FEBRUAR	POTPUNO POMRAČENJE MESECA	univerzalno (svetsko) vreme dan h min
•	→	ULAZAK MESECA U POLUSENKU	21 0 34.9
•••	→	PRVI KONTAKT SA SENKOM	21 1 42.9
••••	⇉	SREDINA POMRAČENJA	21 3 26.0
•••	→	POSLEDNJI KONTAKT SA SENKOM	21 5 9.1
•	→	IZLAZAK MESECA IZ POLUSENKE	21 6 17.2

3.	1. AVGUST	POTPUNO POMRAČENJE SUNCA	univerzalno (svetsko) vreme dan h min
•	→	POČETAK POMRAČENJA	1 8 4.1
•••	→	POČETAK POTPUNOG POMRAČENJA	1 9 22.6
••••	⇉	SREDINA POMRAČENJA	1 9 47.4
•••	→	KRAJ POTPUNOG POMRAČENJA	1 11 20.0
•	→	KRAJ POMRAČENJA	1 12 38.4
		VIDLJIVOST: ARKTIK, EVROPA, AZIJA	

4.	16. AVGUST	DELIMIČNO POMRAČENJE MESECA	univerzalno (svetsko) vreme dan h min
•	→	ULAZAK MESECA U POLUSENKU	16 18 23.1
••••	⇉	SREDINA POMRAČENJA	16 21 10.1
•	→	IZLAZAK MESECA IZ POLUSENKE	16 23 57.1

KALENDAR

za prestupnu 2008. godinu

JANUAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
UT	1	1	4466.5
SR	2	2	4467.5
ČE	3	3	4468.5
PE	4	4	4469.5
SU	5	5	4470.5
NE1	6	6	4471.5
PO	7	7	4472.5
UT	8	8	4473.5
SR	9	9	4474.5
ČE	10	10	4475.5
PE	11	11	4476.5
SU	12	12	4477.5
NE2	13	13	4478.5
PO	14	14	4479.5
UT	15	15	4480.5
SR	16	16	4481.5
ČE	17	17	4482.5
PE	18	18	4483.5
SU	19	19	4484.5
NE3	20	20	4485.5
PO	21	21	4486.5
UT	22	22	4487.5
SR	23	23	4488.5
ČE	24	24	4489.5
PE	25	25	4490.5
SU	26	26	4491.5
NE4	27	27	4492.5
PO	28	28	4493.5
UT	29	29	4494.5
SR	30	30	4495.5
ČE	31	31	4496.5

FEBRUAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
PE	1	32	4497.5
SU	2	33	4498.5
NE5	3	34	4499.5
PO	4	35	4500.5
UT	5	36	4501.5
SR	6	37	4502.5
ČE	7	38	4503.5
PE	8	39	4504.5
SU	9	40	4505.5
NE6	10	41	4506.5
PO	11	42	4507.5
UT	12	43	4508.5
SR	13	44	4509.5
ČE	14	45	4510.5
PE	15	46	4511.5
SU	16	47	4512.5
NE7	17	48	4513.5
PO	18	49	4514.5
UT	19	50	4515.5
SR	20	51	4516.5
ČE	21	52	4517.5
PE	22	53	4518.5
SU	23	54	4519.5
NE8	24	55	4520.5
PO	25	56	4521.5
UT	26	57	4522.5
SR	27	58	4523.5
ČE	28	59	4524.5
PE	29	60	4525.5

MART

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
SU	1	61	4526.5
NE9	2	62	4527.5
PO	3	63	4528.5
UT	4	64	4529.5
SR	5	65	4530.5
ČE	6	66	4531.5
PE	7	67	4532.5
SU	8	68	4533.5
NE10	9	69	4534.5
PO	10	70	4535.5
UT	11	71	4536.5
SR	12	72	4537.5
ČE	13	73	4538.5
PE	14	74	4539.5
SU	15	75	4540.5
NE11	16	76	4541.5
PO	17	77	4542.5
UT	18	78	4543.5
SR	19	79	4544.5
ČE	20	80	4545.5
PE	21	81	4546.5
SU	22	82	4547.5
NE12	23	83	4548.5
PO	24	84	4549.5
UT	25	85	4550.5
SR	26	86	4551.5
ČE	27	87	4552.5
PE	28	88	4553.5
SU	29	89	4554.5
NE13	30	90	4555.5
PO	31	91	4556.5

APRIL

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
UT	1	92	4557.5
SR	2	93	4558.5
ČE	3	94	4559.5
PE	4	95	4560.5
SU	5	96	4561.5
NE14	6	97	4562.5
PO	7	98	4563.5
UT	8	99	4564.5
SR	9	100	4565.5
ČE	10	101	4566.5
PE	11	102	4567.5
SU	12	103	4568.5
NE15	13	104	4569.5
PO	14	105	4570.5
UT	15	106	4571.5
SR	16	107	4572.5
ČE	17	108	4573.5
PE	18	109	4574.5
SU	19	110	4575.5
NE16	20	111	4576.5
PO	21	112	4577.5
UT	22	113	4578.5
SR	23	114	4579.5
ČE	24	115	4580.5
PE	25	116	4581.5
SU	26	117	4582.5
NE17	27	118	4583.5
PO	28	119	4584.5
UT	29	120	4585.5
SR	30	121	4586.5

MAJ

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
ČE	1	122	4587.5
PE	2	123	4588.5
SU	3	124	4589.5
NE18	4	125	4590.5
PO	5	126	4591.5
UT	6	127	4592.5
SR	7	128	4593.5
ČE	8	129	4594.5
PE	9	130	4595.5
SU	10	131	4596.5
NE19	11	132	4597.5
PO	12	133	4598.5
UT	13	134	4599.5
SR	14	135	4600.5
ČE	15	136	4601.5
PE	16	137	4602.5
SU	17	138	4603.5
NE20	18	139	4604.5
PO	19	140	4605.5
UT	20	141	4606.5
SR	21	142	4607.5
ČE	22	143	4608.5
PE	23	144	4609.5
SU	24	145	4610.5
NE21	25	146	4611.5
PO	26	147	4612.5
UT	27	148	4613.5
SR	28	149	4614.5
ČE	29	150	4615.5
PE	30	151	4616.5
SU	31	152	4617.5

JUN

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
NE22	1	153	4618.5
PO	2	154	4619.5
UT	3	155	4620.5
SR	4	156	4621.5
ČE	5	157	4622.5
PE	6	158	4623.5
SU	7	159	4624.5
NE23	8	160	4625.5
PO	9	161	4626.5
UT	10	162	4627.5
SR	11	163	4628.5
ČE	12	164	4629.5
PE	13	165	4630.5
SU	14	166	4631.5
NE24	15	167	4632.5
PO	16	168	4633.5
UT	17	169	4634.5
SR	18	170	4635.5
ČE	19	171	4636.5
PE	20	172	4637.5
SU	21	173	4638.5
NE25	22	174	4639.5
PO	23	175	4640.5
UT	24	176	4641.5
SR	25	177	4642.5
ČE	26	178	4643.5
PE	27	179	4644.5
SU	28	180	4645.5
NE26	29	181	4646.5
PO	30	182	4647.5

JUL

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
UT	1	183	4648.5
SR	2	184	4649.5
ČE	3	185	4650.5
PE	4	186	4651.5
SU	5	187	4652.5
NE27	6	188	4653.5
PO	7	189	4654.5
UT	8	190	4655.5
SR	9	191	4656.5
ČE	10	192	4657.5
PE	11	193	4658.5
SU	12	194	4659.5
NE28	13	195	4660.5
PO	14	196	4661.5
UT	15	197	4662.5
SR	16	198	4663.5
ČE	17	199	4664.5
PE	18	200	4665.5
SU	19	201	4666.5
NE29	20	202	4667.5
PO	21	203	4668.5
UT	22	204	4669.5
SR	23	205	4670.5
ČE	24	206	4671.5
PE	25	207	4672.5
SU	26	208	4673.5
NE30	27	209	4674.5
PO	28	210	4675.5
UT	29	211	4676.5
SR	30	212	4677.5
ČE	31	213	4678.5

AVGUST

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
PE	1	214	4679.5
SU	2	215	4680.5
NE31	3	216	4681.5
PO	4	217	4682.5
UT	5	218	4683.5
SR	6	219	4684.5
ČE	7	220	4685.5
PE	8	221	4686.5
SU	9	222	4687.5
NE32	10	223	4688.5
PO	11	224	4689.5
UT	12	225	4690.5
SR	13	226	4691.5
ČE	14	227	4692.5
PE	15	228	4693.5
SU	16	229	4694.5
NE33	17	230	4695.5
PO	18	231	4696.5
UT	19	232	4697.5
SR	20	233	4698.5
ČE	21	234	4699.5
PE	22	235	4700.5
SU	23	236	4701.5
NE34	24	237	4702.5
PO	25	238	4703.5
UT	26	239	4704.5
SR	27	240	4705.5
ČE	28	241	4706.5
PE	29	242	4707.5
SU	30	243	4708.5
NE35	31	244	4709.5

SEPTEMBAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
PO	1	245	4710.5
UT	2	246	4711.5
SR	3	247	4712.5
ČE	4	248	4713.5
PE	5	249	4714.5
SU	6	250	4715.5
NE36	7	251	4716.5
PO	8	252	4717.5
UT	9	253	4718.5
SR	10	254	4719.5
ČE	11	255	4720.5
PE	12	256	4721.5
SU	13	257	4722.5
NE37	14	258	4723.5
PO	15	259	4724.5
UT	16	260	4725.5
SR	17	261	4726.5
ČE	18	262	4727.5
PE	19	263	4728.5
SU	20	264	4729.5
NE38	21	265	4730.5
PO	22	266	4731.5
UT	23	267	4732.5
SR	24	268	4733.5
ČE	25	269	4734.5
PE	26	270	4735.5
SU	27	271	4736.5
NE39	28	272	4737.5
PO	29	273	4738.5
UT	30	274	4739.5

OKTOBAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
SR	1	275	4740.5
ČE	2	276	4741.5
PE	3	277	4742.5
SU	4	278	4743.5
NE40	5	279	4744.5
PO	6	280	4745.5
UT	7	281	4746.5
SR	8	282	4747.5
ČE	9	283	4748.5
PE	10	284	4749.5
SU	11	285	4750.5
NE41	12	286	4751.5
PO	13	287	4752.5
UT	14	288	4753.5
SR	15	289	4754.5
ČE	16	290	4755.5
PE	17	291	4756.5
SU	18	292	4757.5
NE42	19	293	4758.5
PO	20	294	4759.5
UT	21	295	4760.5
SR	22	296	4761.5
ČE	23	297	4762.5
PE	24	298	4763.5
SU	25	299	4764.5
NE43	26	300	4765.5
PO	27	301	4766.5
UT	28	302	4767.5
SR	29	303	4768.5
ČE	30	304	4769.5
PE	31	305	4770.5

NOVEMBAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
SU	1	306	4771.5
NE44	2	307	4772.5
PO	3	308	4773.5
UT	4	309	4774.5
SR	5	310	4775.5
ČE	6	311	4776.5
PE	7	312	4777.5
SU	8	313	4778.5
NE45	9	314	4779.5
PO	10	315	4780.5
UT	11	316	4781.5
SR	12	317	4782.5
ČE	13	318	4783.5
PE	14	319	4784.5
SU	15	320	4785.5
NE46	16	321	4786.5
PO	17	322	4787.5
UT	18	323	4788.5
SR	19	324	4789.5
ČE	20	325	4790.5
PE	21	326	4791.5
SU	22	327	4792.5
NE47	23	328	4793.5
PO	24	329	4794.5
UT	25	330	4795.5
SR	26	331	4796.5
ČE	27	332	4797.5
PE	28	333	4798.5
SU	29	334	4799.5
NE48	30	335	4800.5

DECEMBAR

Dan u sed.	Dan u mes.	Dan u god.	Julijanski datum
			245
PO	1	336	4801.5
UT	2	337	4802.5
SR	3	338	4803.5
ČE	4	339	4804.5
PE	5	340	4805.5
SU	6	341	4806.5
NE49	7	342	4807.5
PO	8	343	4808.5
UT	9	344	4809.5
SR	10	345	4810.5
ČE	11	346	4811.5
PE	12	347	4812.5
SU	13	348	4813.5
NE50	14	349	4814.5
PO	15	350	4815.5
UT	16	351	4816.5
SR	17	352	4817.5
ČE	18	353	4818.5
PE	19	354	4819.5
SU	20	355	4820.5
NE51	21	356	4821.5
PO	22	357	4822.5
UT	23	358	4823.5
SR	24	359	4824.5
ČE	25	360	4825.5
PE	26	361	4826.5
SU	27	362	4827.5
NE52	28	363	4828.5
PO	29	364	4829.5
UT	30	365	4830.5
SR	31	366	4831.5

⋆ ★ ★ ★ ⋆

Efemeride

SUNCA, MESECA, VENERE,
MARSA, JUPITERA I SATURNA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 13.5	-23 4.1	100 1.5	220 12.1	-18 28.2	10 10.0	26 56.5
2	209 12.9	-23 3.8	130 6.4	250 10.8	-18 29.5	40 17.0	26 56.5
4	239 12.3	-23 3.4	160 11.4	280 9.5	-18 30.9	70 23.9	26 56.6
6	269 11.7	-23 3.0	190 16.3	310 8.2	-18 32.2	100 30.9	26 56.7
8	299 11.1	-23 2.6	220 21.2	340 6.9	-18 33.6	130 37.8	26 56.7
10	329 10.5	-23 2.2	250 26.2	10 5.6	-18 34.9	160 44.8	26 56.8
12	359 10.0	-23 1.8	280 31.1	40 4.3	-18 36.2	190 51.7	26 56.9
14	29 9.4	-23 1.4	310 36.0	70 3.0	-18 37.5	220 58.7	26 56.9
16	59 8.8	-23 1.0	340 40.9	100 1.7	-18 38.9	251 5.6	26 57.0
18	89 8.2	-23 .6	10 45.9	130 .4	-18 40.2	281 12.5	26 57.1
20	119 7.6	-23 .2	40 50.8	159 59.1	-18 41.5	311 19.5	26 57.1
22	149 7.0	-22 59.8	70 55.7	189 57.8	-18 42.8	341 26.4	26 57.2
Δ	-3	2		-7	-7	35	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 32.2	161	-10 20.8	-131	186 45.0	-23 14.2	299 19.9	9 58.2
2	294 42.5	161	-10 47.1	-130	216 48.7	-23 14.2	329 24.9	9 58.3
4	323 52.7	160	-11 13.1	-129	246 52.3	-23 14.2	359 30.0	9 58.4
6	353 2.8	160	-11 39.0	-128	276 56.0	-23 14.2	29 35.0	9 58.4
8	22 12.8	159	-12 4.6	-127	306 59.7	-23 14.1	59 40.0	9 58.5
10	51 22.6	159	-12 30.1	-126	337 3.4	-23 14.1	89 45.1	9 58.6
12	80 32.3	158	-12 55.3	-125	7 7.1	-23 14.1	119 50.1	9 58.6
14	109 41.9	157	-13 20.4	-124	37 10.8	-23 14.1	149 55.1	9 58.7
16	138 51.4	156	-13 45.2	-123	67 14.4	-23 14.1	180 .2	9 58.7
18	168 .6	156	-14 9.7	-122	97 18.1	-23 14.0	210 5.2	9 58.8
20	197 9.8	155	-14 34.1	-121	127 21.8	-23 14.0	240 10.2	9 58.9
22	226 18.7	154	-14 58.2	-119	157 25.5	-23 14.0	270 15.3	9 58.9
Δ					18	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 4	0 57	2 44	1 38	3.6	11 3	.0
55	8 25	15 42	0 45	2 17	1 23	3.2	11 20	.4
50	7 59	16 8	0 38	1 59	1 12	2.9	11 33	.6
45	7 38	16 29	0 34	1 46	1 3	2.7	11 44	.8
40	7 22	16 45	0 30	1 37	0 56	2.5	11 53	1.0
35	7 8	16 59	0 28	1 30	0 50	2.4	12 0	1.1
30	6 56	17 11	0 26	1 25	0 44	2.3	12 7	1.2
20	6 35	17 32	0 24	1 18	0 35	2.1	12 19	1.4
10	6 17	17 50	0 23	1 15	0 26	1.9	12 29	1.6
0	5 60	18 7	0 22	1 15	0 19	1.7	12 39	1.8
10	5 42	18 24	0 23	1 17	0 11	1.6	12 48	1.9
20	5 24	18 43	0 24	1 24	0 3	1.4	12 59	2.1
30	5 2	19 5	0 27	1 36	. . .	.0	13 10	2.3
35	4 49	19 17	0 30	1 46	. . .	.0	13 17	2.4
40	4 34	19 32	0 33	2 2	. . .	.0	13 25	2.6
45	4 17	19 50	0 37	2 30	23 55	.9	13 34	2.7
50	3 55	20 12	0 44	: ::	23 42	.7	13 46	2.9
55	3 25	20 41	0 57	: ::	23 26	.5	13 60	3.2
60	2 42	21 24	1 36	: ::	23 5	.1	14 18	3.6
S								

SUNCE UT	SUNCE $e=T_p-UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 3 5.7	-1.2	16.3	$T_{\overline{m}}$ 6 29	1.8	54.5	14.9
12	- 3 20.0	$T_{\overline{m}_\odot}$ 12 h 3.3 min		Starost 22.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 20	.1	120	-4.0	♄	11 32	.0	87	-1.7
♂	23 14	.2	270	-1.5	♃	4 2	.0	199	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 6.4	-22 59.4	101 .7	219 56.4	-18 44.1	11 33.3	26 57.2
2	209 5.8	-22 58.9	131 5.6	249 55.1	-18 45.4	41 40.2	26 57.3
4	239 5.2	-22 58.5	161 10.5	279 53.8	-18 46.8	71 47.1	26 57.4
6	269 4.6	-22 58.1	191 15.4	309 52.5	-18 48.1	101 54.0	26 57.4
8	299 4.0	-22 57.7	221 20.4	339 51.1	-18 49.4	132 .9	26 57.5
10	329 3.5	-22 57.2	251 25.3	9 49.8	-18 50.6	162 7.8	26 57.5
12	359 2.9	-22 56.8	281 30.2	39 48.5	-18 51.9	192 14.7	26 57.6
14	29 2.3	-22 56.3	311 35.2	69 47.2	-18 53.2	222 21.6	26 57.6
16	59 1.7	-22 55.9	341 40.1	99 45.8	-18 54.5	252 28.5	26 57.7
18	89 1.1	-22 55.5	11 45.0	129 44.5	-18 55.8	282 35.4	26 57.7
20	119 .5	-22 55.0	41 49.9	159 43.1	-18 57.1	312 42.3	26 57.8
22	148 59.9	-22 54.6	71 54.9	189 41.8	-18 58.4	342 49.2	26 57.8
Δ	-3	2		-7	-6	34	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	255 27.5	153	-15 22.1	-118	187 29.2	-23 14.0	300 20.3	9 59.0
2	284 36.1	152	-15 45.7	-117	217 32.9	-23 14.0	330 25.3	9 59.1
4	313 44.5	151	-16 9.0	-116	247 36.5	-23 13.9	0 30.4	9 59.1
6	342 52.7	150	-16 32.1	-114	277 40.2	-23 13.9	30 35.4	9 59.2
8	12 .7	149	-16 55.0	-113	307 43.9	-23 13.9	60 40.4	9 59.3
10	41 8.5	148	-17 17.6	-111	337 47.6	-23 13.9	90 45.5	9 59.3
12	70 16.1	147	-17 39.8	-110	7 51.3	-23 13.8	120 50.5	9 59.4
14	99 23.5	146	-18 1.8	-109	37 55.0	-23 13.8	150 55.6	9 59.5
16	128 30.6	145	-18 23.6	-107	67 58.7	-23 13.8	181 .6	9 59.5
18	157 37.5	143	-18 45.0	-106	98 2.3	-23 13.8	211 5.6	9 59.6
20	186 44.2	142	-19 6.1	-104	128 6.0	-23 13.8	241 10.7	9 59.7
22	215 50.6	141	-19 26.9	-102	158 9.7	-23 13.7	271 15.7	9 59.7
Δ					18	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	15 6	0 57	2 44	3 4	3.7	11 4	.1
55	8 25	15 43	0 45	2 17	2 40	3.2	11 30	.5
50	7 59	16 9	0 38	1 59	2 22	2.9	11 49	.8
45	7 38	16 29	0 34	1 46	2 8	2.7	12 4	1.0
40	7 22	16 46	0 30	1 37	1 57	2.6	12 17	1.2
35	7 8	16 60	0 28	1 30	1 47	2.4	12 27	1.3
30	6 56	17 12	0 26	1 25	1 39	2.3	12 37	1.4
20	6 35	17 32	0 24	1 18	1 24	2.1	12 53	1.6
10	6 17	17 50	0 23	1 15	1 12	2.0	13 7	1.7
0	6 0	18 8	0 22	1 15	1 0	1.8	13 21	1.9
10	5 43	18 25	0 23	1 17	0 49	1.7	13 34	2.0
20	5 24	18 43	0 24	1 24	0 36	1.5	13 49	2.2
30	5 3	19 5	0 27	1 36	0 23	1.3	14 6	2.3
35	4 50	19 17	0 30	1 46	0 15	1.2	14 15	2.5
40	4 35	19 32	0 33	2 2	0 6	1.1	14 26	2.6
45	4 18	19 50	0 37	2 29	. . .	.0	14 40	2.7
50	3 56	20 12	0 44	: ::	23 59	.9	14 56	2.9
55	3 27	20 41	0 57	: ::	23 37	.6	15 16	3.2
60	2 44	21 23	1 35	: ::	23 6	.2	15 45	3.7
S								

SUNCE UT	SUNCE $e=T_p-UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 3 34.2	-1.2	16.3	$T_{\overline{m}}$ 7 11	1.8	54.2	14.8
12	- 3 48.3	$T_{\overline{m}_\odot}$ 12 h 3.8 min		Starost 23.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 21	.1	119	-4.0	♄	11 29	.0	86	-1.7
♂	23 8	.2	271	-1.5	♃	3 58	.0	199	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 59.4	-22 54.1	101 59.8	219 40.5	-18 59.6	12 56.0	26 57.9
2	208 58.8	-22 53.6	132 4.7	249 39.1	-19 .9	43 2.9	26 57.9
4	238 58.2	-22 53.2	162 9.6	279 37.8	-19 2.2	73 9.8	26 58.0
6	268 57.6	-22 52.7	192 14.6	309 36.4	-19 3.4	103 16.6	26 58.0
8	298 57.0	-22 52.3	222 19.5	339 35.1	-19 4.7	133 23.5	26 58.0
10	328 56.5	-22 51.8	252 24.4	9 33.7	-19 5.9	163 30.4	26 58.1
12	358 55.9	-22 51.3	282 29.4	39 32.4	-19 7.2	193 37.2	26 58.1
14	28 55.3	-22 50.8	312 34.3	69 31.0	-19 8.4	223 44.1	26 58.2
16	58 54.7	-22 50.4	342 39.2	99 29.6	-19 9.7	253 50.9	26 58.2
18	88 54.1	-22 49.9	12 44.1	129 28.3	-19 10.9	283 57.7	26 58.2
20	118 53.6	-22 49.4	42 49.1	159 26.9	-19 12.2	314 4.6	26 58.3
22	148 53.0	-22 48.9	72 54.0	189 25.6	-19 13.4	344 11.4	26 58.3
Δ	-3	2		-7	-6	34	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	244 56.8	140	-19 47.4	-101	188 13.4	-23 13.7	301 20.8	9 59.8
2	274 2.7	138	-20 7.5	-99	218 17.1	-23 13.7	331 25.8	9 59.9
4	303 8.4	137	-20 27.4	-98	248 20.8	-23 13.7	1 30.9	9 59.9
6	332 13.8	136	-20 46.9	-96	278 24.5	-23 13.6	31 35.9	10 .0
8	1 19.0	134	-21 6.0	-94	308 28.1	-23 13.6	61 41.0	10 .1
10	30 23.9	133	-21 24.9	-92	338 31.8	-23 13.6	91 46.0	10 .1
12	59 28.5	132	-21 43.3	-91	8 35.5	-23 13.6	121 51.0	10 .2
14	88 32.8	130	-22 1.4	-89	38 39.2	-23 13.6	151 56.1	10 .3
16	117 36.9	129	-22 19.1	-87	68 42.9	-23 13.5	182 1.1	10 .4
18	146 40.7	128	-22 36.5	-85	98 46.6	-23 13.5	212 6.2	10 .4
20	175 44.2	126	-22 53.5	-83	128 50.3	-23 13.5	242 11.2	10 .5
22	204 47.5	125	-23 10.1	-81	158 53.9	-23 13.5	272 16.3	10 .6
Δ					18	0	25	0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	15 7	0 56	2 44	4 32	3.8	11 6	.2
55	8 25	15 44	0 45	2 16	3 57	3.2	11 42	.8
50	7 58	16 10	0 38	1 59	3 33	2.9	12 8	1.0
45	7 38	16 30	0 34	1 46	3 14	2.7	12 28	1.2
40	7 22	16 47	0 30	1 37	2 58	2.6	12 44	1.4
35	7 8	17 0	0 28	1 30	2 46	2.5	12 58	1.5
30	6 56	17 12	0 26	1 25	2 34	2.4	13 10	1.6
20	6 36	17 33	0 24	1 18	2 15	2.2	13 31	1.7
10	6 18	17 51	0 23	1 15	1 59	2.1	13 49	1.9
0	6 1	18 8	0 22	1 15	1 44	1.9	14 6	2.0
10	5 43	18 25	0 23	1 17	1 29	1.8	14 23	2.1
20	5 25	18 44	0 24	1 24	1 12	1.6	14 41	2.2
30	5 3	19 5	0 27	1 36	0 54	1.5	15 2	2.4
35	4 51	19 18	0 29	1 46	0 43	1.4	15 14	2.5
40	4 36	19 32	0 33	2 1	0 31	1.3	15 28	2.6
45	4 19	19 50	0 37	2 29	0 17	1.1	15 45	2.7
50	3 57	20 11	0 44	: ::	.. ..	.0	16 6	2.9
55	3 28	20 40	0 56	: ::	23 52	1.0	16 34	3.2
60	2 45	21 22	1 33	: ::	23 10	.4	17 14	3.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 4 2.4	-1.2	16.3	$T_{\overline{m}}$ 7 55	1.9	54.1	14.7
12	- 4 16.3	$T_{\overline{m}_\odot}$ 12 h 4.3 min		Starost 24.3 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 22	.1	118	-4.0	♃	11 26	.0	86	-1.7
♂	23 3	.2	271	-1.4	♄	3 54	.0	199	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 52.4	-22 48.4	102 58.9	219 24.2	-19 14.6	14 18.2	26 58.3
2	208 51.8	-22 47.9	133 3.9	249 22.8	-19 15.9	44 25.1	26 58.4
4	238 51.3	-22 47.4	163 8.8	279 21.5	-19 17.1	74 31.9	26 58.4
6	268 50.7	-22 46.9	193 13.7	309 20.1	-19 18.3	104 38.7	26 58.4
8	298 50.1	-22 46.4	223 18.6	339 18.7	-19 19.5	134 45.5	26 58.5
10	328 49.5	-22 45.9	253 23.6	9 17.3	-19 20.8	164 52.3	26 58.5
12	358 49.0	-22 45.4	283 28.5	39 16.0	-19 22.0	194 59.1	26 58.5
14	28 48.4	-22 44.9	313 33.4	69 14.6	-19 23.2	225 5.9	26 58.6
16	58 47.8	-22 44.3	343 38.4	99 13.2	-19 24.4	255 12.7	26 58.6
18	88 47.2	-22 43.8	13 43.3	129 11.8	-19 25.6	285 19.5	26 58.6
20	118 46.7	-22 43.3	43 48.2	159 10.4	-19 26.8	315 26.3	26 58.6
22	148 46.1	-22 42.8	73 53.1	189 9.0	-19 28.0	345 33.1	26 58.7
Δ	-3	3		-7	-6	34	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 50.4	123	-23 26.2	-79	188 57.6	-23 13.4	302 21.4	10 .6
2	262 53.1	122	-23 42.0	-77	219 1.3	-23 13.4	332 26.4	10 .7
4	291 55.5	121	-23 57.4	-75	249 5.0	-23 13.4	2 31.5	10 .8
6	320 57.6	119	-24 12.4	-73	279 8.7	-23 13.4	32 36.5	10 .8
8	349 59.5	118	-24 26.9	-71	309 12.4	-23 13.3	62 41.6	10 .9
10	19 1.0	116	-24 41.0	-68	339 16.1	-23 13.3	92 46.6	10 1.0
12	48 2.3	115	-24 54.7	-66	9 19.8	-23 13.3	122 51.7	10 1.1
14	77 3.3	114	-25 7.9	-64	39 23.4	-23 13.3	152 56.7	10 1.1
16	106 4.1	112	-25 20.7	-62	69 27.1	-23 13.2	183 1.8	10 1.2
18	135 4.5	111	-25 33.0	-59	99 30.8	-23 13.2	213 6.9	10 1.3
20	164 4.7	110	-25 44.8	-57	129 34.5	-23 13.2	243 11.9	10 1.4
22	193 4.7	108	-25 56.2	-55	159 38.2	-23 13.2	273 17.0	10 1.4
Δ					18	0	25	0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	15 9	0 56	2 43	6 2	3.7	11 12	.6
55	8 24	15 45	0 45	2 16	5 15	3.1	12 1	1.2
50	7 58	16 11	0 38	1 58	4 43	2.8	12 33	1.4
45	7 38	16 31	0 34	1 46	4 19	2.7	12 58	1.6
40	7 22	16 48	0 30	1 37	4 0	2.5	13 17	1.7
35	7 8	17 1	0 28	1 30	3 45	2.5	13 34	1.8
30	6 56	17 13	0 26	1 25	3 31	2.4	13 48	1.8
20	6 36	17 34	0 24	1 18	3 8	2.2	14 12	1.9
10	6 18	17 52	0 23	1 15	2 48	2.1	14 33	2.0
0	6 1	18 8	0 22	1 15	2 30	2.0	14 53	2.1
10	5 44	18 25	0 23	1 17	2 11	1.9	15 13	2.2
20	5 26	18 44	0 24	1 23	1 52	1.8	15 34	2.3
30	5 4	19 5	0 27	1 36	1 29	1.7	15 59	2.4
35	4 52	19 18	0 29	1 46	1 16	1.6	16 13	2.4
40	4 37	19 32	0 32	2 1	1 1	1.5	16 30	2.5
45	4 20	19 50	0 37	2 28	0 43	1.4	16 50	2.6
50	3 58	20 11	0 44	: ::	0 21	1.2	17 16	2.7
55	3 29	20 40	0 56	: ::	.. ..	.0	17 50	2.9
60	2 47	21 22	1 32	: ::	23 20	.9	18 44	3.5
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 4 30.2	-1.1	16.3	$T_{\overline{m}}$ 8 41	2.1	54.1	14.7
12	- 4 44.0	$T_{\overline{m}_\odot}$ 12 h 4.7 min		Starost 25.3 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 23	.1	116	-4.0	♃	11 23	.0	86	-1.7
♂	22 58	.2	271	-1.4	♄	3 50	.0	199	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 45.5	-22 42.2	103 58.1	219 7.6	-19 29.2	15 39.8	26 58.7
2	208 45.0	-22 41.7	134 3.0	249 6.2	-19 30.3	45 46.6	26 58.7
4	238 44.4	-22 41.2	164 7.9	279 4.9	-19 31.5	75 53.4	26 58.7
6	268 43.8	-22 40.6	194 12.9	309 3.5	-19 32.7	106 .1	26 58.8
8	298 43.3	-22 40.1	224 17.8	339 2.1	-19 33.9	136 6.9	26 58.8
10	328 42.7	-22 39.5	254 22.7	9 .7	-19 35.1	166 13.6	26 58.8
12	358 42.1	-22 39.0	284 27.6	38 59.3	-19 36.2	196 20.4	26 58.8
14	28 41.6	-22 38.4	314 32.6	68 57.9	-19 37.4	226 27.1	26 58.8
16	58 41.0	-22 37.9	344 37.5	98 56.4	-19 38.6	256 33.9	26 58.8
18	88 40.5	-22 37.3	14 42.4	128 55.0	-19 39.7	286 40.6	26 58.9
20	118 39.9	-22 36.8	44 47.4	158 53.6	-19 40.9	316 47.3	26 58.9
22	148 39.3	-22 36.2	74 52.3	188 52.2	-19 42.0	346 54.1	26 58.9
Δ	-3	3		-7	-6	34	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 4.3	107	-26 7.1	-52	189 41.9	-23 13.1	303 22.0	10 1.5
2	251 3.7	106	-26 17.6	-50	219 45.6	-23 13.1	333 27.1	10 1.6
4	280 2.9	105	-26 27.5	-47	249 49.3	-23 13.1	3 32.2	10 1.7
6	309 1.8	103	-26 36.9	-45	279 52.9	-23 13.0	33 37.2	10 1.7
8	338 .5	102	-26 45.9	-42	309 56.6	-23 13.0	63 42.3	10 1.8
10	6 58.9	101	-26 54.3	-40	340 .3	-23 13.0	93 47.3	10 1.9
12	35 57.1	100	-27 2.2	-37	10 4.0	-23 13.0	123 52.4	10 2.0
14	64 55.1	99	-27 9.6	-34	40 7.7	-23 12.9	153 57.5	10 2.0
16	93 52.9	98	-27 16.5	-32	70 11.4	-23 12.9	184 2.5	10 2.1
18	122 50.5	97	-27 22.8	-29	100 15.1	-23 12.9	214 7.6	10 2.2
20	151 47.9	96	-27 28.6	-26	130 18.8	-23 12.9	244 12.7	10 2.3
22	180 45.1	95	-27 33.9	-24	160 22.5	-23 12.8	274 17.7	10 2.3
Δ					18	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 0	15 10	0 56	2 43	7 32	3.2	11 25	1.4
55	8 24	15 47	0 45	2 16	6 29	2.7	12 29	1.8
50	7 58	16 13	0 38	1 58	5 51	2.6	13 7	1.9
45	7 38	16 32	0 33	1 46	5 23	2.5	13 35	2.0
40	7 22	16 48	0 30	1 37	5 2	2.4	13 58	2.0
35	7 9	17 2	0 28	1 30	4 44	2.4	14 16	2.1
30	6 57	17 14	0 26	1 25	4 28	2.3	14 32	2.1
20	6 36	17 34	0 24	1 18	4 2	2.3	14 59	2.1
10	6 18	17 52	0 23	1 15	3 40	2.2	15 22	2.2
0	6 1	18 9	0 22	1 15	3 19	2.2	15 43	2.2
10	5 44	18 26	0 23	1 17	2 58	2.1	16 5	2.2
20	5 26	18 44	0 24	1 23	2 36	2.0	16 28	2.2
30	5 5	19 5	0 27	1 35	2 10	2.0	16 55	2.3
35	4 52	19 18	0 29	1 45	1 55	1.9	17 11	2.3
40	4 38	19 32	0 32	2 1	1 38	1.8	17 30	2.3
45	4 21	19 49	0 37	2 27	1 17	1.8	17 52	2.3
50	3 59	20 11	0 43	: ::	0 51	1.7	18 21	2.4
55	3 30	20 39	0 56	: ::	0 15	1.4	19 1	2.4
60	2 49	21 21	1 30	: ::	23 42	2.0	20 8	2.6
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 4 57.7	-1.1	16.3		9 31	2.2	54.3	14.8
12	- 5 11.2	$T_{\overline{m}_\odot}$ 12 h	5.2 min	Starost 26.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 24	.1	115	-4.0	♃	11 20	.0	86	-1.7
♂	22 52	.2	272	-1.4	♄	3 46	.0	199	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 38.8	-22 35.6	104 57.2	218 50.8	-19 43.2	17 .8	26 58.9
2	208 38.2	-22 35.1	135 2.1	248 49.4	-19 44.3	47 7.5	26 58.9
4	238 37.7	-22 34.5	165 7.1	278 48.0	-19 45.5	77 14.2	26 58.9
6	268 37.1	-22 33.9	195 12.0	308 46.5	-19 46.6	107 20.9	26 58.9
8	298 36.5	-22 33.3	225 16.9	338 45.1	-19 47.7	137 27.6	26 58.9
10	328 36.0	-22 32.7	255 21.8	8 43.7	-19 48.9	167 34.3	26 58.9
12	358 35.4	-22 32.2	285 26.8	38 42.3	-19 50.0	197 41.0	26 59.0
14	28 34.9	-22 31.6	315 31.7	68 40.9	-19 51.1	227 47.7	26 59.0
16	58 34.3	-22 31.0	345 36.6	98 39.4	-19 52.2	257 54.4	26 59.0
18	88 33.8	-22 30.4	15 41.6	128 38.0	-19 53.4	288 1.1	26 59.0
20	118 33.2	-22 29.8	45 46.5	158 36.6	-19 54.5	318 7.7	26 59.0
22	148 32.7	-22 29.2	75 51.4	188 35.1	-19 55.6	348 14.4	26 59.0
Δ	-3	3		-7	-6	33	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	209 42.1	94	-27 38.6	-21	190 26.1	-23 12.8	304 22.8	10 2.4
2	238 38.9	93	-27 42.8	-18	220 29.8	-23 12.8	334 27.9	10 2.5
4	267 35.6	93	-27 46.4	-15	250 33.5	-23 12.7	4 33.0	10 2.6
6	296 32.1	92	-27 49.5	-13	280 37.2	-23 12.7	34 38.0	10 2.6
8	325 28.5	91	-27 52.0	-10	310 40.9	-23 12.7	64 43.1	10 2.7
10	354 24.7	91	-27 53.9	-7	340 44.6	-23 12.7	94 48.2	10 2.8
12	23 20.9	90	-27 55.3	-4	10 48.3	-23 12.6	124 53.2	10 2.9
14	52 16.9	90	-27 56.1	-1	40 52.0	-23 12.6	154 58.3	10 3.0
16	81 12.8	89	-27 56.3	2	70 55.7	-23 12.6	185 3.4	10 3.0
18	110 8.7	89	-27 55.9	5	100 59.4	-23 12.5	215 8.5	10 3.1
20	139 4.4	89	-27 55.0	8	131 3.1	-23 12.5	245 13.5	10 3.2
22	168 .1	88	-27 53.5	10	161 6.7	-23 12.5	275 18.6	10 3.3
Δ					18	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 59	15 12	0 56	2 42	8 48	1.9	11 58	2.7
55	8 23	15 48	0 45	2 16	7 34	2.1	13 11	2.5
50	7 58	16 14	0 38	1 58	6 53	2.1	13 53	2.4
45	7 38	16 33	0 33	1 46	6 23	2.2	14 23	2.4
40	7 22	16 49	0 30	1 37	5 60	2.2	14 46	2.4
35	7 9	17 3	0 28	1 30	5 40	2.2	15 5	2.3
30	6 57	17 15	0 26	1 25	5 24	2.2	15 22	2.3
20	6 36	17 35	0 24	1 18	4 56	2.2	15 50	2.3
10	6 19	17 53	0 23	1 15	4 33	2.2	16 14	2.3
0	6 2	18 9	0 22	1 15	4 10	2.2	16 36	2.2
10	5 45	18 26	0 23	1 17	3 48	2.2	16 58	2.2
20	5 27	18 44	0 24	1 23	3 25	2.2	17 22	2.2
30	5 6	19 5	0 27	1 35	2 57	2.2	17 50	2.1
35	4 53	19 18	0 29	1 45	2 41	2.2	18 6	2.1
40	4 39	19 32	0 32	2 0	2 22	2.2	18 25	2.0
45	4 22	19 49	0 37	2 26	1 59	2.2	18 48	2.0
50	4 0	20 11	0 43	: ::	1 30	2.2	19 18	1.9
55	3 32	20 39	0 55	: ::	0 50	2.1	19 59	1.8
60	2 50	21 20	1 28	: ::	.. ..	.0	21 10	1.3
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 5 24.7	-1.1	16.3		10 23	2.2	54.6	14.9
12	- 5 38.1	$T_{\overline{m}_\odot}$ 12 h	5.6 min	Starost 27.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 25	.1	114	-3.9	♃	11 17	.0	85	-1.7
♂	22 47	.2	272	-1.4	♄	3 42	.0	199	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 32.1	-22 28.6	105 56.3	218 33.7	-19 56.7	18 21.1	26 59.0
2	208 31.6	-22 28.0	136 1.3	248 32.3	-19 57.8	48 27.7	26 59.0
4	238 31.0	-22 27.4	166 6.2	278 30.8	-19 58.9	78 34.4	26 59.0
6	268 30.5	-22 26.7	196 11.1	308 29.4	-19 60.0	108 41.0	26 59.0
8	298 29.9	-22 26.1	226 16.1	338 27.9	-20 1.1	138 47.7	26 59.0
10	328 29.4	-22 25.5	256 21.0	8 26.5	-20 2.2	168 54.3	26 59.0
12	358 28.8	-22 24.9	286 25.9	38 25.0	-20 3.2	199 .9	26 59.0
14	28 28.3	-22 24.3	316 30.8	68 23.6	-20 4.3	229 7.6	26 59.0
16	58 27.7	-22 23.6	346 35.8	98 22.1	-20 5.4	259 14.2	26 59.0
18	88 27.2	-22 23.0	16 40.7	128 20.7	-20 6.5	289 20.8	26 59.0
20	118 26.6	-22 22.4	46 45.6	158 19.2	-20 7.5	319 27.4	26 59.0
22	148 26.1	-22 21.7	76 50.6	188 17.8	-20 8.6	349 34.0	26 59.0
Δ	-3	3		-7	-5	33	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	196 55.8	88	-27 51.4	13	191 10.4	-23 12.4	305 23.7	10 3.4
2	225 51.4	88	-27 48.7	16	221 14.1	-23 12.4	335 28.8	10 3.4
4	254 47.0	88	-27 45.5	19	251 17.8	-23 12.4	5 33.9	10 3.5
6	283 42.5	88	-27 41.7	22	281 21.5	-23 12.4	35 38.9	10 3.6
8	312 38.1	88	-27 37.2	25	311 25.2	-23 12.3	65 44.0	10 3.7
10	341 33.6	88	-27 32.2	28	341 28.9	-23 12.3	95 49.1	10 3.8
12	10 29.2	88	-27 26.7	31	11 32.6	-23 12.3	125 54.2	10 3.8
14	39 24.8	88	-27 20.5	34	41 36.3	-23 12.2	155 59.3	10 3.9
16	68 20.5	88	-27 13.7	37	71 40.0	-23 12.2	186 4.3	10 4.0
18	97 16.2	89	-27 6.4	39	101 43.7	-23 12.2	216 9.4	10 4.1
20	126 11.9	89	-26 58.5	42	131 47.4	-23 12.1	246 14.5	10 4.2
22	155 7.7	90	-26 50.1	45	161 51.0	-23 12.1	276 19.6	10 4.3
Δ					18	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 58	15 14	0 55	2 42	9 34	.8	13 3	3.8
55	8 23	15 50	0 44	2 15	8 25	1.4	14 11	3.1
50	7 58	16 15	0 38	1 58	7 44	1.7	14 51	2.9
45	7 38	16 34	0 33	1 46	7 15	1.8	15 20	2.7
40	7 22	16 50	0 30	1 37	6 52	1.9	15 43	2.6
35	7 9	17 4	0 28	1 30	6 33	2.0	16 2	2.6
30	6 57	17 15	0 26	1 25	6 17	2.0	16 18	2.5
20	6 37	17 36	0 24	1 18	5 49	2.1	16 45	2.4
10	6 19	17 53	0 23	1 15	5 26	2.2	17 8	2.3
0	6 2	18 10	0 22	1 15	5 4	2.2	17 29	2.2
10	5 46	18 27	0 23	1 17	4 42	2.3	17 51	2.1
20	5 27	18 45	0 24	1 23	4 18	2.3	18 14	2.0
30	5 6	19 6	0 27	1 35	3 50	2.4	18 40	1.9
35	4 54	19 18	0 29	1 45	3 34	2.5	18 56	1.8
40	4 40	19 32	0 32	1 60	3 15	2.5	19 14	1.7
45	4 23	19 49	0 37	2 26	2 52	2.6	19 36	1.6
50	4 1	20 10	0 43	: ::	2 23	2.7	20 4	1.5
55	3 33	20 38	0 55	: ::	1 42	2.9	20 42	1.2
60	2 52	21 19	1 27	: ::	0 31	3.3	21 42	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 51.4	-1.1	16.3	$T_{\overline{m}}$	11 16	2.3	54.9	15.0
12	- 6 4.5	$T_{\overline{m}_\odot}$ 12 h 6.1 min		Starost 28.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 26	.1	113	-3.9	♆	11 14	.0	85	-1.7
♂	22 42	.2	272	-1.3	♄	3 38	.0	199	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.6	-22 21.1	106 55.5	218 16.3	-20 9.7	19 40.6	26 58.9
2	208 25.0	-22 20.4	137 .4	248 14.9	-20 10.7	49 47.2	26 58.9
4	238 24.5	-22 19.8	167 5.3	278 13.4	-20 11.8	79 53.8	26 58.9
6	268 24.0	-22 19.1	197 10.3	308 11.9	-20 12.8	110 .4	26 58.9
8	298 23.4	-22 18.5	227 15.2	338 10.5	-20 13.9	140 7.0	26 58.9
10	328 22.9	-22 17.8	257 20.1	8 9.0	-20 14.9	170 13.6	26 58.9
12	358 22.3	-22 17.2	287 25.1	38 7.5	-20 16.0	200 20.1	26 58.9
14	28 21.8	-22 16.5	317 30.0	68 6.1	-20 17.0	230 26.7	26 58.9
16	58 21.3	-22 15.8	347 34.9	98 4.6	-20 18.0	260 33.3	26 58.9
18	88 20.7	-22 15.2	17 39.8	128 3.1	-20 19.1	290 39.8	26 58.8
20	118 20.2	-22 14.5	47 44.8	158 1.6	-20 20.1	320 46.4	26 58.8
22	148 19.7	-22 13.8	77 49.7	188 .1	-20 21.1	350 52.9	26 58.8
Δ	-3	3		-7	-5	33	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	184 3.7	90	-26 41.0	48	191 54.7	-23 12.1	306 24.7	10 4.3
2	212 59.7	91	-26 31.4	51	221 58.4	-23 12.0	336 29.8	10 4.4
4	241 55.8	91	-26 21.2	54	252 2.1	-23 12.0	6 34.8	10 4.5
6	270 52.0	92	-26 10.5	56	282 5.8	-23 12.0	36 39.9	10 4.6
8	299 48.3	92	-25 59.2	59	312 9.5	-23 11.9	66 45.0	10 4.7
10	328 44.8	93	-25 47.3	62	342 13.2	-23 11.9	96 50.1	10 4.8
12	357 41.4	94	-25 34.9	65	12 16.9	-23 11.9	126 55.2	10 4.9
14	26 38.1	95	-25 21.9	67	42 20.6	-23 11.8	157 .3	10 4.9
16	55 35.0	95	-25 8.4	70	72 24.3	-23 11.8	187 5.4	10 5.0
18	84 32.1	96	-24 54.4	73	102 28.0	-23 11.8	217 10.5	10 5.1
20	113 29.3	97	-24 39.8	75	132 31.7	-23 11.7	247 15.6	10 5.2
22	142 26.7	98	-24 24.7	78	162 35.4	-23 11.7	277 20.6	10 5.3
Δ					18	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 58	15 16	0 55	2 41	9 54	.4	14 33	4.1
55	8 22	15 51	0 44	2 15	8 60	1.0	15 26	3.5
50	7 57	16 16	0 38	1 58	8 24	1.3	16 1	3.2
45	7 38	16 35	0 33	1 46	7 58	1.4	16 26	2.9
40	7 22	16 51	0 30	1 37	7 37	1.6	16 46	2.8
35	7 9	17 5	0 28	1 30	7 20	1.7	17 3	2.7
30	6 57	17 16	0 26	1 25	7 5	1.8	17 17	2.6
20	6 37	17 36	0 24	1 18	6 40	1.9	17 42	2.4
10	6 19	17 54	0 23	1 15	6 17	2.1	18 3	2.3
0	6 3	18 10	0 22	1 14	5 57	2.2	18 22	2.1
10	5 46	18 27	0 23	1 17	5 36	2.3	18 42	2.0
20	5 28	18 45	0 24	1 23	5 14	2.4	19 2	1.9
30	5 7	19 6	0 27	1 35	4 48	2.5	19 26	1.7
35	4 55	19 18	0 29	1 45	4 33	2.6	19 40	1.6
40	4 41	19 32	0 32	1 59	4 15	2.7	19 56	1.5
45	4 24	19 49	0 36	2 25	3 54	2.9	20 15	1.3
50	4 3	20 10	0 43	: ::	3 27	3.0	20 39	1.1
55	3 35	20 37	0 55	: ::	2 50	3.3	21 10	.8
60	2 54	21 17	1 25	: ::	1 50	4.0	21 56	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 6 17.6	-1.1	16.3	$T_{\overline{m}}$	12 10	2.1	55.4	15.1
12	- 6 30.4	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 29.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 27	.1	111	-3.9	♆	11 11	.0	85	-1.7
♂	22 36	.2	273	-1.3	♄	3 34	.0	199	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 19.1	-22 13.1	107 54.6	217 58.7	-20 22.1	20 59.5	26 58.8
2	208 18.6	-22 12.4	137 59.6	247 57.2	-20 23.1	51 6.0	26 58.8
4	238 18.1	-22 11.8	168 4.5	277 55.7	-20 24.1	81 12.5	26 58.8
6	268 17.6	-22 11.1	198 9.4	307 54.2	-20 25.2	111 19.0	26 58.7
8	298 17.0	-22 10.4	228 14.3	337 52.7	-20 26.2	141 25.6	26 58.7
10	328 16.5	-22 9.7	258 19.3	7 51.2	-20 27.2	171 32.1	26 58.7
12	358 16.0	-22 9.0	288 24.2	37 49.8	-20 28.1	201 38.6	26 58.7
14	28 15.5	-22 8.3	318 29.1	67 48.3	-20 29.1	231 45.1	26 58.7
16	58 14.9	-22 7.6	348 34.1	97 46.8	-20 30.1	261 51.6	26 58.6
18	88 14.4	-22 6.9	18 39.0	127 45.3	-20 31.1	291 58.1	26 58.6
20	118 13.9	-22 6.2	48 43.9	157 43.8	-20 32.1	322 4.5	26 58.6
22	148 13.4	-22 5.5	78 48.8	187 42.3	-20 33.1	352 11.0	26 58.6
Δ	-3	3		-7	-5	33	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	171 24.3	99	-24 9.1	81	192 39.1	-23 11.7	307 25.7	10 5.4
2	200 22.1	100	-23 53.0	83	222 42.8	-23 11.6	337 30.8	10 5.5
4	229 20.0	101	-23 36.3	86	252 46.5	-23 11.6	7 35.9	10 5.5
6	258 18.2	102	-23 19.2	88	282 50.2	-23 11.6	37 41.0	10 5.6
8	287 16.5	103	-23 1.6	91	312 53.9	-23 11.5	67 46.1	10 5.7
10	316 15.1	104	-22 43.4	93	342 57.6	-23 11.5	97 51.2	10 5.8
12	345 13.9	105	-22 24.8	95	13 1.2	-23 11.5	127 56.3	10 5.9
14	14 12.8	106	-22 5.8	98	43 4.9	-23 11.4	158 1.4	10 6.0
16	43 12.0	107	-21 46.2	100	73 8.6	-23 11.4	188 6.5	10 6.1
18	72 11.4	108	-21 26.2	102	103 12.3	-23 11.4	218 11.6	10 6.2
20	101 11.0	109	-21 5.7	105	133 16.0	-23 11.3	248 16.7	10 6.2
22	130 10.8	110	-20 44.8	107	163 19.7	-23 11.3	278 21.8	10 6.3
Δ					18	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 56	15 18	0 55	2 41	10 3	.2	16 11	4.1
55	8 22	15 53	0 44	2 15	9 23	.6	16 50	3.6
50	7 57	16 17	0 38	1 58	8 55	1.0	17 16	3.3
45	7 38	16 37	0 33	1 45	8 33	1.2	17 37	3.0
40	7 22	16 52	0 30	1 37	8 16	1.3	17 53	2.8
35	7 9	17 5	0 28	1 30	8 1	1.5	18 7	2.7
30	6 57	17 17	0 26	1 25	7 48	1.6	18 19	2.6
20	6 37	17 37	0 24	1 18	7 26	1.8	18 39	2.4
10	6 20	17 54	0 23	1 15	7 7	1.9	18 57	2.2
0	6 3	18 11	0 22	1 14	6 49	2.1	19 13	2.0
10	5 47	18 27	0 23	1 17	6 31	2.2	19 29	1.9
20	5 29	18 45	0 24	1 23	6 12	2.4	19 47	1.7
30	5 8	19 6	0 27	1 35	5 49	2.6	20 6	1.5
35	4 56	19 18	0 29	1 44	5 36	2.7	20 18	1.4
40	4 42	19 32	0 32	1 59	5 21	2.8	20 31	1.2
45	4 25	19 49	0 36	2 24	5 3	3.0	20 46	1.1
50	4 4	20 9	0 43	: ::	4 40	3.2	21 5	.8
55	3 36	20 37	0 54	: ::	4 10	3.5	21 29	.5
60	2 56	21 16	1 24	: ::	3 26	4.1	22 1	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 6 43.2	-1.0	16.3	$T_{\overline{m}}$ 13 1	2.1	55.8	15.2
12	- 6 55.8	$T_{\overline{m}_\odot}$ 12 h 6.9 min		Starost .5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 29	.1	110	-3.9	♄	11 8	.0	85	-1.7
♂	22 31	.2	273	-1.3	♃	3 30	.0	200	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 12.9	-22 4.8	108 53.8	217 40.8	-20 34.0	22 17.5	26 58.5
2	208 12.3	-22 4.0	138 58.7	247 39.3	-20 35.0	52 24.0	26 58.5
4	238 11.8	-22 3.3	169 3.6	277 37.8	-20 36.0	82 30.4	26 58.5
6	268 11.3	-22 2.6	199 8.5	307 36.3	-20 36.9	112 36.9	26 58.5
8	298 10.8	-22 1.9	229 13.5	337 34.8	-20 37.9	142 43.3	26 58.4
10	328 10.3	-22 1.1	259 18.4	7 33.2	-20 38.8	172 49.8	26 58.4
12	358 9.8	-22 .4	289 23.3	37 31.7	-20 39.8	202 56.2	26 58.4
14	28 9.3	-21 59.7	319 28.3	67 30.2	-20 40.7	233 2.7	26 58.3
16	58 8.7	-21 58.9	349 33.2	97 28.7	-20 41.7	263 9.1	26 58.3
18	88 8.2	-21 58.2	19 38.1	127 27.2	-20 42.6	293 15.5	26 58.3
20	118 7.7	-21 57.4	49 43.0	157 25.7	-20 43.5	323 21.9	26 58.3
22	148 7.2	-21 56.7	79 48.0	187 24.2	-20 44.5	353 28.3	26 58.2
Δ	-3	4		-8	-5	32	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	159 10.9	111	-20 23.5	109	193 23.4	-23 11.3	308 26.9	10 6.4
2	188 11.1	112	-20 1.7	111	223 27.1	-23 11.2	338 32.0	10 6.5
4	217 11.6	113	-19 39.5	113	253 30.8	-23 11.2	8 37.1	10 6.6
6	246 12.3	114	-19 16.9	115	283 34.5	-23 11.1	38 42.2	10 6.7
8	275 13.2	116	-18 53.9	117	313 38.2	-23 11.1	68 47.3	10 6.8
10	304 14.3	117	-18 30.5	119	343 41.9	-23 11.1	98 52.4	10 6.9
12	333 15.6	118	-18 6.7	121	13 45.6	-23 11.0	128 57.5	10 7.0
14	2 17.1	119	-17 42.6	123	43 49.3	-23 11.0	159 2.6	10 7.1
16	31 18.8	120	-17 18.0	125	73 53.0	-23 11.0	189 7.7	10 7.1
18	60 20.8	121	-16 53.1	126	103 56.7	-23 10.9	219 12.9	10 7.2
20	89 22.9	122	-16 27.8	128	134 .4	-23 10.9	249 18.0	10 7.3
22	118 25.2	123	-16 2.2	130	164 4.1	-23 10.9	279 23.1	10 7.4
Δ					18	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 55	15 20	0 55	2 40	10 6	.1	17 50	4.0
55	8 21	15 54	0 44	2 14	9 38	.5	18 16	3.6
50	7 56	16 19	0 38	1 57	9 17	.8	18 35	3.3
45	7 37	16 38	0 33	1 45	9 1	1.0	18 49	3.0
40	7 22	16 53	0 30	1 36	8 48	1.1	19 2	2.8
35	7 9	17 6	0 28	1 30	8 36	1.3	19 12	2.7
30	6 57	17 18	0 26	1 25	8 26	1.4	19 21	2.6
20	6 37	17 38	0 24	1 18	8 9	1.6	19 36	2.3
10	6 20	17 55	0 23	1 15	7 53	1.8	19 50	2.1
0	6 4	18 11	0 22	1 14	7 39	2.0	20 2	2.0
10	5 47	18 27	0 23	1 17	7 25	2.2	20 14	1.8
20	5 29	18 45	0 24	1 23	7 9	2.4	20 27	1.6
30	5 9	19 6	0 27	1 34	6 51	2.6	20 42	1.4
35	4 57	19 18	0 29	1 44	6 41	2.7	20 51	1.2
40	4 43	19 32	0 32	1 58	6 29	2.9	21 0	1.1
45	4 26	19 48	0 36	2 23	6 15	3.0	21 12	.9
50	4 5	20 9	0 43	3 45	5 57	3.3	21 25	.7
55	3 38	20 36	0 54	: ::	5 35	3.6	21 42	.4
60	2 59	21 15	1 22	: ::	5 4	4.0	22 4	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 7 8.4	-1.0	16.3	$T_{\overline{m}}$ 13 51	2.0	56.3	15.3
12	- 7 20.7	$T_{\overline{m}_\odot}$ 12 h 7.4 min		Starost 1.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 30	.1	109	-3.9	♄	11 5	.0	84	-1.7
♂	22 26	.2	273	-1.3	♃	3 26	.0	200	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 6.7	-21 55.9	109 52.9	217 22.6	-20 45.4	23 34.7	26 58.2
2	208 6.2	-21 55.2	139 57.8	247 21.1	-20 46.3	53 41.1	26 58.2
4	238 5.7	-21 54.4	170 2.8	277 19.6	-20 47.2	83 47.5	26 58.1
6	268 5.2	-21 53.7	200 7.7	307 18.1	-20 48.1	113 53.9	26 58.1
8	298 4.7	-21 52.9	230 12.6	337 16.5	-20 49.0	144 .3	26 58.1
10	328 4.2	-21 52.1	260 17.5	7 15.0	-20 49.9	174 6.7	26 58.0
12	358 3.7	-21 51.4	290 22.5	37 13.5	-20 50.8	204 13.1	26 58.0
14	28 3.2	-21 50.6	320 27.4	67 11.9	-20 51.7	234 19.4	26 57.9
16	58 2.7	-21 49.8	350 32.3	97 10.4	-20 52.6	264 25.8	26 57.9
18	88 2.2	-21 49.1	20 37.3	127 8.9	-20 53.5	294 32.1	26 57.9
20	118 1.7	-21 48.3	50 42.2	157 7.3	-20 54.4	324 38.5	26 57.8
22	148 1.2	-21 47.5	80 47.1	187 5.8	-20 55.3	354 44.8	26 57.8
Δ	-3	4		-8	-4	32	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	147 27.7	123	-15 36.3	131	194 7.8	-23 10.8	309 28.2	10 7.5
2	176 30.4	124	-15 10.0	133	224 11.5	-23 10.8	339 33.3	10 7.6
4	205 33.3	125	-14 43.5	134	254 15.2	-23 10.7	9 38.4	10 7.7
6	234 36.3	126	-14 16.6	136	284 18.9	-23 10.7	39 43.5	10 7.8
8	263 39.5	127	-13 49.4	137	314 22.6	-23 10.7	69 48.6	10 7.9
10	292 42.9	128	-13 21.9	139	344 26.3	-23 10.6	99 53.7	10 8.0
12	321 46.5	128	-12 54.1	140	14 30.0	-23 10.6	129 58.8	10 8.1
14	350 50.2	129	-12 26.1	142	44 33.7	-23 10.5	160 4.0	10 8.2
16	19 54.0	130	-11 57.8	143	74 37.4	-23 10.5	190 9.1	10 8.3
18	48 58.0	131	-11 29.2	144	104 41.1	-23 10.5	220 14.2	10 8.4
20	78 2.1	131	-11 .4	145	134 44.8	-23 10.4	250 19.3	10 8.5
22	107 6.3	132	-10 31.4	146	164 48.5	-23 10.4	280 24.4	10 8.5
Δ					19	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 54	15 22	0 54	2 40	10 8	.0	19 26	3.9
55	8 20	15 56	0 44	2 14	9 49	.4	19 41	3.5
50	7 56	16 20	0 37	1 57	9 36	.6	19 53	3.2
45	7 37	16 39	0 33	1 45	9 24	.8	20 2	3.0
40	7 22	16 54	0 30	1 36	9 15	1.0	20 10	2.8
35	7 8	17 7	0 28	1 30	9 7	1.2	20 17	2.7
30	6 57	17 19	0 26	1 25	8 60	1.3	20 22	2.5
20	6 37	17 38	0 24	1 18	8 48	1.5	20 32	2.3
10	6 20	17 55	0 23	1 15	8 37	1.7	20 41	2.1
0	6 4	18 11	0 22	1 14	8 27	1.9	20 49	1.9
10	5 48	18 28	0 23	1 17	8 16	2.1	20 57	1.7
20	5 30	18 45	0 24	1 23	8 6	2.3	21 5	1.5
30	5 10	19 6	0 27	1 34	7 53	2.5	21 15	1.3
35	4 58	19 18	0 29	1 44	7 46	2.7	21 20	1.1
40	4 44	19 31	0 32	1 58	7 37	2.8	21 26	1.0
45	4 27	19 48	0 36	2 22	7 28	3.0	21 33	.8
50	4 7	20 8	0 42	3 34	7 16	3.3	21 41	.6
55	3 40	20 35	0 53	: ::	7 1	3.5	21 52	.3
60	3 1	21 13	1 21	: ::	6 41	3.9	22 5	.0
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 7 33.0	-1.0	16.3	$T_{\overline{m}}$ 14 38	1.9	56.8	15.5
12	- 7 45.0	$T_{\overline{m}_\odot}$ 12 h 7.8 min		Starost 2.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 31	.1	107	-3.9	♄	11 2	.0	84	-1.7
♂	22 21	.2	274	-1.2	♃	3 22	.0	200	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 .7	-21 46.7	110 52.0	217 4.3	-20 56.2	24 51.2	26 57.7
2	208 .2	-21 45.9	140 57.0	247 2.7	-20 57.0	54 57.5	26 57.7
4	237 59.7	-21 45.1	171 1.9	277 1.2	-20 57.9	85 3.8	26 57.7
6	267 59.2	-21 44.3	201 6.8	306 59.6	-20 58.8	115 10.1	26 57.6
8	297 58.7	-21 43.5	231 11.8	336 58.1	-20 59.6	145 16.4	26 57.6
10	327 58.2	-21 42.7	261 16.7	6 56.5	-21 .5	175 22.7	26 57.5
12	357 57.8	-21 41.9	291 21.6	36 55.0	-21 1.3	205 29.0	26 57.5
14	27 57.3	-21 41.1	321 26.5	66 53.4	-21 2.2	235 35.3	26 57.5
16	57 56.8	-21 40.3	351 31.5	96 51.9	-21 3.0	265 41.6	26 57.4
18	87 56.3	-21 39.5	21 36.4	126 50.3	-21 3.9	295 47.9	26 57.4
20	117 55.8	-21 38.7	51 41.3	156 48.8	-21 4.7	325 54.2	26 57.3
22	147 55.3	-21 37.9	81 46.3	186 47.2	-21 5.6	356 .5	26 57.3
Δ	-2	4		-8	-4	31	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	136 10.7	132	-10 2.1	147	194 52.2	-23 10.3	310 29.5	10 8.6
2	165 15.1	133	- 9 32.6	149	224 55.9	-23 10.3	340 34.7	10 8.7
4	194 19.7	133	- 9 2.9	150	254 59.6	-23 10.3	10 39.8	10 8.8
6	223 24.3	134	- 8 33.0	150	285 3.3	-23 10.2	40 44.9	10 8.9
8	252 29.1	134	- 8 2.9	151	315 7.0	-23 10.2	70 50.0	10 9.0
10	281 33.9	134	- 7 32.6	152	345 10.7	-23 10.1	100 55.1	10 9.1
12	310 38.8	135	- 7 2.1	153	15 14.4	-23 10.1	131 .2	10 9.2
14	339 43.7	135	- 6 31.5	154	45 18.1	-23 10.1	161 5.4	10 9.3
16	8 48.7	135	- 6 .7	155	75 21.8	-23 10.0	191 10.5	10 9.4
18	37 53.7	135	- 5 29.8	155	105 25.5	-23 10.0	221 15.6	10 9.5
20	66 58.8	135	- 4 58.8	156	135 29.3	-23 9.9	251 20.7	10 9.6
22	96 3.9	136	- 4 27.6	157	165 33.0	-23 9.9	281 25.9	10 9.7
Δ					19	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 53	15 24	0 54	2 39	10 8	.0	20 59	3.9
55	8 19	15 57	0 44	2 14	9 58	.3	21 6	3.5
50	7 55	16 21	0 37	1 57	9 51	.6	21 11	3.3
45	7 37	16 40	0 33	1 45	9 45	.8	21 15	3.0
40	7 21	16 55	0 30	1 36	9 40	1.0	21 18	2.9
35	7 8	17 8	0 28	1 29	9 35	1.1	21 21	2.7
30	6 57	17 19	0 26	1 24	9 31	1.3	21 23	2.5
20	6 38	17 39	0 24	1 18	9 24	1.5	21 27	2.3
10	6 21	17 56	0 23	1 15	9 18	1.7	21 31	2.1
0	6 4	18 12	0 22	1 14	9 13	1.9	21 34	1.9
10	5 48	18 28	0 23	1 17	9 7	2.1	21 38	1.7
20	5 31	18 45	0 24	1 22	9 1	2.3	21 41	1.5
30	5 11	19 6	0 27	1 34	8 54	2.5	21 45	1.2
35	4 59	19 17	0 29	1 43	8 50	2.7	21 47	1.1
40	4 45	19 31	0 32	1 57	8 46	2.8	21 50	1.0
45	4 28	19 47	0 36	2 21	8 40	3.0	21 53	.8
50	4 8	20 8	0 42	3 27	8 34	3.3	21 56	.6
55	3 41	20 34	0 53	: ::	8 26	3.5	22 0	.3
60	3 3	21 12	1 19	: ::	8 16	3.9	22 5	.0
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 7 57.0	-1.0	16.3	$T_{\overline{m}}$ 15 24	1.9	57.3	15.6
12	- 8 8.7	$T_{\overline{m}_\odot}$ 12 h 8.2 min		Starost 3.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 32	.1	106	-3.9	♄	10 59	.0	84	-1.7
♂	22 16	.2	274	-1.2	♃	3 17	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 54.9	-21 37.0	111 51.2	216 45.7	-21 6.4	26 6.7	26 57.2
2	207 54.4	-21 36.2	141 56.1	246 44.1	-21 7.2	56 13.0	26 57.2
4	237 53.9	-21 35.4	172 1.0	276 42.5	-21 8.0	86 19.2	26 57.1
6	267 53.4	-21 34.6	202 6.0	306 41.0	-21 8.8	116 25.5	26 57.1
8	297 52.9	-21 33.7	232 10.9	336 39.4	-21 9.7	146 31.7	26 57.0
10	327 52.5	-21 32.9	262 15.8	6 37.9	-21 10.5	176 38.0	26 57.0
12	357 52.0	-21 32.1	292 20.7	36 36.3	-21 11.3	206 44.2	26 56.9
14	27 51.5	-21 31.2	322 25.7	66 34.7	-21 12.1	236 50.4	26 56.9
16	57 51.0	-21 30.4	352 30.6	96 33.1	-21 12.9	266 56.6	26 56.8
18	87 50.6	-21 29.5	22 35.5	126 31.6	-21 13.7	297 2.8	26 56.8
20	117 50.1	-21 28.7	52 40.5	156 30.0	-21 14.4	327 9.0	26 56.7
22	147 49.6	-21 27.8	82 45.4	186 28.4	-21 15.2	357 15.2	26 56.7
Δ	-2	4		-8	-4	31	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	125 9.0	136	-3 56.3	157	195 36.7	-23 9.9	311 31.0	10 9.8
2	154 14.1	136	-3 24.8	158	225 40.4	-23 9.8	341 36.1	10 9.9
4	183 19.2	135	-2 53.3	158	255 44.1	-23 9.8	11 41.2	10 10.0
6	212 24.3	135	-2 21.7	158	285 47.8	-23 9.7	41 46.4	10 10.1
8	241 29.4	135	-1 50.0	159	315 51.5	-23 9.7	71 51.5	10 10.2
10	270 34.4	135	-1 18.3	159	345 55.2	-23 9.7	101 56.6	10 10.3
12	299 39.4	135	-0 46.4	159	15 58.9	-23 9.6	132 1.7	10 10.4
14	328 44.3	134	-0 14.6	160	46 2.6	-23 9.6	162 6.9	10 10.5
16	357 49.1	134	0 17.4	160	76 6.3	-23 9.5	192 12.0	10 10.6
18	26 53.9	133	0 49.3	160	106 10.0	-23 9.5	222 17.1	10 10.7
20	55 58.6	133	1 21.3	160	136 13.7	-23 9.4	252 22.3	10 10.8
22	85 3.2	132	1 53.3	160	166 17.4	-23 9.4	282 27.4	10 10.9
Δ					19	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 52	15 26	0 54	2 39	10 8	.0	22 33	4.0
55	8 18	15 59	0 43	2 13	10 6	.3	22 31	3.6
50	7 55	16 23	0 37	1 57	10 5	.6	22 29	3.3
45	7 36	16 41	0 33	1 45	10 4	.8	22 28	3.1
40	7 21	16 56	0 30	1 36	10 3	1.0	22 26	2.9
35	7 8	17 9	0 28	1 29	10 2	1.1	22 25	2.7
30	6 57	17 20	0 26	1 24	10 1	1.3	22 24	2.6
20	6 38	17 40	0 24	1 18	10 0	1.5	22 23	2.4
10	6 21	17 56	0 23	1 14	9 59	1.7	22 21	2.1
0	6 5	18 12	0 22	1 14	9 58	1.9	22 20	1.9
10	5 49	18 28	0 23	1 16	9 57	2.1	22 18	1.7
20	5 31	18 45	0 24	1 22	9 56	2.3	22 17	1.5
30	5 11	19 5	0 27	1 34	9 55	2.6	22 15	1.3
35	4 60	19 17	0 29	1 43	9 54	2.7	22 14	1.2
40	4 46	19 31	0 32	1 57	9 54	2.9	22 13	1.0
45	4 30	19 47	0 36	2 20	9 53	3.1	22 11	.8
50	4 9	20 7	0 42	3 22	9 52	3.3	22 10	.6
55	3 43	20 33	0 53	: ::	9 51	3.6	22 8	.3
60	3 5	21 10	1 18	: ::	9 49	3.9	22 5	.0
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 8 20.4	-.9	16.3	$T_{\overline{m}}$	16 9	1.9	57.8	15.7
12	- 8 31.8	$T_{\overline{m}_\odot}$ 12 h	8.5 min	Starost	4.5 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 33	.1	105	-3.9	♄	10 56	.0	84	-1.7
♂	22 11	.2	274	-1.2	♃	3 13	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 49.2	-21 27.0	112 50.3	216 26.8	-21 16.0	27 21.4	26 56.6
2	207 48.7	-21 26.1	142 55.2	246 25.3	-21 16.8	57 27.6	26 56.6
4	237 48.2	-21 25.2	173 .2	276 23.7	-21 17.6	87 33.8	26 56.5
6	267 47.8	-21 24.4	203 5.1	306 22.1	-21 18.3	117 40.0	26 56.5
8	297 47.3	-21 23.5	233 10.0	336 20.5	-21 19.1	147 46.1	26 56.4
10	327 46.8	-21 22.6	263 15.0	6 18.9	-21 19.8	177 52.3	26 56.4
12	357 46.4	-21 21.8	293 19.9	36 17.4	-21 20.6	207 58.4	26 56.3
14	27 45.9	-21 20.9	323 24.8	66 15.8	-21 21.4	238 4.6	26 56.2
16	57 45.5	-21 20.0	353 29.7	96 14.2	-21 22.1	268 10.7	26 56.2
18	87 45.0	-21 19.1	23 34.7	126 12.6	-21 22.8	298 16.9	26 56.1
20	117 44.5	-21 18.2	53 39.6	156 11.0	-21 23.6	328 23.0	26 56.1
22	147 44.1	-21 17.4	83 44.5	186 9.4	-21 24.3	358 29.1	26 56.0
Δ	-2	4		-8	-4	31	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	114 7.7	132	2 25.3	160	196 21.1	-23 9.4	312 32.5	10 11.0
2	143 12.1	131	2 57.2	160	226 24.8	-23 9.3	342 37.7	10 11.1
4	172 16.3	131	3 29.2	160	256 28.5	-23 9.3	12 42.8	10 11.2
6	201 20.4	130	4 1.1	160	286 32.3	-23 9.2	42 47.9	10 11.3
8	230 24.4	129	4 33.1	159	316 36.0	-23 9.2	72 53.1	10 11.4
10	259 28.2	128	5 4.9	159	346 39.7	-23 9.1	102 58.2	10 11.5
12	288 31.8	127	5 36.7	159	16 43.4	-23 9.1	133 3.3	10 11.6
14	317 35.2	126	6 8.4	158	46 47.1	-23 9.0	163 8.5	10 11.7
16	346 38.4	125	6 40.1	158	76 50.8	-23 9.0	193 13.6	10 11.8
18	15 41.5	124	7 11.6	157	106 54.5	-23 9.0	223 18.7	10 11.9
20	44 44.3	123	7 43.1	157	136 58.2	-23 8.9	253 23.9	10 12.0
22	73 46.9	122	8 14.4	156	167 1.9	-23 8.9	283 29.0	10 12.1
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 50	15 28	0 53	2 38	10 8	.0	.. ..	.0
55	8 17	16 1	0 43	2 13	10 14	.4	23 58	3.8
50	7 54	16 24	0 37	1 56	10 19	.6	23 49	3.5
45	7 36	16 43	0 33	1 45	10 23	.9	23 42	3.2
40	7 21	16 57	0 30	1 36	10 26	1.0	23 36	3.0
35	7 8	17 10	0 28	1 29	10 29	1.2	23 31	2.9
30	6 57	17 21	0 26	1 24	10 32	1.3	23 27	2.7
20	6 38	17 40	0 24	1 18	10 36	1.6	23 19	2.5
10	6 21	17 57	0 22	1 14	10 40	1.8	23 13	2.2
0	6 5	18 13	0 22	1 14	10 44	2.0	23 6	2.0
10	5 49	18 28	0 23	1 16	10 48	2.2	23 0	1.8
20	5 32	18 46	0 24	1 22	10 52	2.4	22 54	1.6
30	5 12	19 5	0 27	1 34	10 57	2.7	22 46	1.4
35	5 0	19 17	0 29	1 43	10 60	2.8	22 42	1.3
40	4 47	19 30	0 32	1 57	11 3	3.0	22 37	1.1
45	4 31	19 46	0 36	2 19	11 7	3.2	22 31	.9
50	4 11	20 6	0 42	3 17	11 11	3.4	22 24	.7
55	3 45	20 32	0 52	: ::	11 17	3.7	22 16	.4
60	3 8	21 9	1 16	: ::	11 24	4.1	22 5	.0
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 8 43.2	-.9	16.3	$T_{\overline{m}}$	16 55	2.0	58.2	15.9
12	- 8 54.2	$T_{\overline{m}_\odot}$ 12 h	8.9 min	Starost	5.5 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 35	.1	104	-3.9	♄	10 53	.0	84	-1.7
♂	22 6	.2	275	-1.1	♃	3 9	.0	200	.5

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	43.6	-21	16.5	113	49.5	216	7.8	-21	25.0	28	35.2	26	56.0
2	207	43.2	-21	15.6	143	54.4	246	6.2	-21	25.8	58	41.3	26	55.9
4	237	42.7	-21	14.7	173	59.3	276	4.6	-21	26.5	88	47.5	26	55.8
6	267	42.3	-21	13.8	204	4.2	306	3.0	-21	27.2	118	53.6	26	55.8
8	297	41.8	-21	12.9	234	9.2	336	1.4	-21	27.9	148	59.6	26	55.7
10	327	41.4	-21	12.0	264	14.1	5	59.8	-21	28.6	179	5.7	26	55.7
12	357	40.9	-21	11.1	294	19.0	35	58.2	-21	29.3	209	11.8	26	55.6
14	27	40.5	-21	10.2	324	24.0	65	56.6	-21	30.0	239	17.9	26	55.5
16	57	40.0	-21	9.2	354	28.9	95	55.0	-21	30.7	269	24.0	26	55.5
18	87	39.6	-21	8.3	24	33.8	125	53.4	-21	31.4	299	30.0	26	55.4
20	117	39.2	-21	7.4	54	38.7	155	51.8	-21	32.1	329	36.1	26	55.4
22	147	38.7	-21	6.5	84	43.7	185	50.2	-21	32.8	359	42.1	26	55.3
Δ		-2		5				-8		-4		30		0

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	102	49.2	121	8	45.6	155	197	5.6	-23	8.8	313	34.2	10	12.2
2	131	51.3	119	9	16.7	155	227	9.3	-23	8.8	343	39.3	10	12.3
4	160	53.2	118	9	47.7	154	257	13.1	-23	8.7	13	44.4	10	12.4
6	189	54.8	116	10	18.4	153	287	16.8	-23	8.7	43	49.6	10	12.5
8	218	56.1	115	10	49.0	152	317	20.5	-23	8.6	73	54.7	10	12.6
10	247	57.1	114	11	19.5	151	347	24.2	-23	8.6	103	59.9	10	12.8
12	276	57.8	112	11	49.7	150	17	27.9	-23	8.6	134	5.0	10	12.9
14	305	58.2	110	12	19.7	149	47	31.6	-23	8.5	164	10.1	10	13.0
16	334	58.3	109	12	49.5	148	77	35.3	-23	8.5	194	15.3	10	13.1
18	3	58.0	107	13	19.1	147	107	39.0	-23	8.4	224	20.4	10	13.2
20	32	57.4	105	13	48.4	145	137	42.7	-23	8.4	254	25.6	10	13.3
22	61	56.5	104	14	17.4	144	167	46.5	-23	8.3	284	30.7	10	13.4
Δ								19		0		26		1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 49	15 30	0 53	2 37	10 8	.1	0 11	4.2
55	8 16	16 3	0 43	2 13	10 23	.5	. . .	.0
50	7 53	16 26	0 37	1 56	10 34	.8	. . .	.0
45	7 35	16 44	0 33	1 44	10 44	1.0	. . .	.0
40	7 20	16 58	0 30	1 36	10 51	1.2	. . .	.0
35	7 8	17 11	0 28	1 29	10 58	1.4	. . .	.0
30	6 57	17 22	0 26	1 24	11 4	1.5	. . .	.0
20	6 38	17 41	0 24	1 17	11 14	1.7	. . .	.0
10	6 21	17 57	0 22	1 14	11 23	1.9	. . .	.0
0	6 6	18 13	0 22	1 14	11 32	2.1	23 56	2.2
10	5 50	18 29	0 23	1 16	11 41	2.3	23 45	2.0
20	5 33	18 46	0 24	1 22	11 50	2.5	23 33	1.8
30	5 13	19 5	0 27	1 33	12 1	2.8	23 20	1.6
35	5 1	19 17	0 29	1 42	12 7	2.9	23 12	1.5
40	4 48	19 30	0 32	1 56	12 14	3.1	23 3	1.3
45	4 32	19 46	0 36	2 18	12 22	3.3	22 53	1.1
50	4 12	20 5	0 42	3 13	12 33	3.5	22 41	.9
55	3 47	20 31	0 52	: ::	12 46	3.9	22 26	.6
60	3 10	21 7	1 15	: ::	13 3	4.4	22 5	.1
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 5.3	-.9	16.3	$T_{\overline{m}}$	17 44	2.2	58.7	16.0
12	- 9 16.0	$T_{\overline{m}_\odot}$ 12 h 9.3 min		Starost 6.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 36	.1	102	-3.9	♃	10 50	.0	83	-1.7
♂	22 1	.2	275	-1.1	♄	3 5	.0	200	.5

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	38.3	-21	5.6	114	48.6	215	48.6	-21	33.5	29	48.2	26	55.2
2	207	37.8	-21	4.6	144	53.5	245	47.0	-21	34.2	59	54.2	26	55.2
4	237	37.4	-21	3.7	174	58.5	275	45.4	-21	34.8	90	.2	26	55.1
6	267	37.0	-21	2.8	205	3.4	305	43.8	-21	35.5	120	6.2	26	55.0
8	297	36.5	-21	1.8	235	8.3	335	42.2	-21	36.2	150	12.3	26	55.0
10	327	36.1	-21	.9	265	13.2	5	40.5	-21	36.8	180	18.3	26	54.9
12	357	35.7	-21	.0	295	18.2	35	38.9	-21	37.5	210	24.3	26	54.9
14	27	35.2	-20	59.0	325	23.1	65	37.3	-21	38.1	240	30.3	26	54.8
16	57	34.8	-20	58.1	355	28.0	95	35.7	-21	38.8	270	36.3	26	54.7
18	87	34.4	-20	57.1	25	33.0	125	34.1	-21	39.4	300	42.3	26	54.7
20	117	33.9	-20	56.2	55	37.9	155	32.4	-21	40.1	330	48.2	26	54.6
22	147	33.5	-20	55.2	85	42.8	185	30.8	-21	40.7	0	54.2	26	54.5
Δ		-2		5				-8		-3		30		0

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	90	55.2	102	14	46.2	143	197	50.2	-23	8.3	314	35.9	10	13.5
2	119	53.5	100	15	14.7	141	227	53.9	-23	8.2	344	41.0	10	13.6
4	148	51.5	98	15	43.0	139	257	57.6	-23	8.2	14	46.2	10	13.7
6	177	49.1	96	16	10.8	138	288	1.3	-23	8.1	44	51.3	10	13.8
8	206	46.3	94	16	38.4	136	318	5.0	-23	8.1	74	56.5	10	13.9
10	235	43.1	92	17	5.7	134	348	8.7	-23	8.0	105	1.6	10	14.0
12	264	39.5	90	17	32.5	133	18	12.5	-23	8.0	135	6.8	10	14.1
14	293	35.5	88	17	59.0	131	48	16.2	-23	7.9	165	11.9	10	14.2
16	322	31.1	86	18	25.2	129	78	19.9	-23	7.9	195	17.1	10	14.4
18	351	26.2	84	18	50.9	127	108	23.6	-23	7.8	225	22.2	10	14.5
20	20	21.0	81	19	16.2	125	138	27.3	-23	7.8	255	27.4	10	14.6
22	49	15.2	79	19	41.1	122	168	31.0	-23	7.7	285	32.5	10	14.7
Δ								19		0		26		1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 47	15 33	0 53	2 37	10 10	.2	1 52	4.5
55	8 15	16 4	0 43	2 12	10 35	.7	1 29	3.9
50	7 52	16 27	0 37	1 56	10 53	1.0	1 13	3.6
45	7 35	16 45	0 33	1 44	11 8	1.3	0 60	3.3
40	7 20	16 60	0 30	1 36	11 20	1.4	0 49	3.1
35	7 8	17 12	0 27	1 29	11 30	1.6	0 40	3.0
30	6 57	17 23	0 26	1 24	11 40	1.7	0 32	2.8
20	6 38	17 41	0 24	1 17	11 55	1.9	0 18	2.6
10	6 21	17 58	0 22	1 14	12 10	2.1	0 7	2.4
0	6 6	18 13	0 22	1 14	12 23	2.3	. . .	.0
10	5 50	18 29	0 23	1 16	12 36	2.5	. . .	.0
20	5 33	18 46	0 24	1 22	12 51	2.7	. . .	.0
30	5 14	19 5	0 27	1 33	13 7	2.9	23 58	1.9
35	5 2	19 16	0 29	1 42	13 17	3.0	23 47	1.7
40	4 49	19 30	0 32	1 55	13 28	3.2	23 34	1.6
45	4 33	19 45	0 35	2 17	13 41	3.4	23 20	1.4
50	4 14	20 5	0 41	3 9	13 58	3.6	23 2	1.2
55	3 48	20 30	0 51	: ::	14 18	4.0	22 39	.8
60	3 12	21 5	1 14	: ::	14 47	4.6	22 7	.2
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 26.7	-.9	16.3	$T_{\overline{m}}$	18 36	2.3	59.1	16.1
12	- 9 37.1	$T_{\overline{m}_\odot}$ 12 h 9.6 min		Starost 7.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 37	.1	101	-3.9	♃	10 47	.0	83	-1.7
♂	21 56	.2	275	-1.1	♄	3 1	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 33.1	-20 54.3	115 47.7	215 29.2	-21 41.3	31 .2	26 54.5
2	207 32.7	-20 53.3	145 52.7	245 27.6	-21 42.0	61 6.1	26 54.4
4	237 32.2	-20 52.3	175 57.6	275 25.9	-21 42.6	91 12.1	26 54.3
6	267 31.8	-20 51.4	206 2.5	305 24.3	-21 43.2	121 18.0	26 54.3
8	297 31.4	-20 50.4	236 7.4	335 22.7	-21 43.8	151 24.0	26 54.2
10	327 31.0	-20 49.4	266 12.4	5 21.1	-21 44.4	181 29.9	26 54.1
12	357 30.6	-20 48.5	296 17.3	35 19.4	-21 45.0	211 35.8	26 54.0
14	27 30.1	-20 47.5	326 22.2	65 17.8	-21 45.6	241 41.8	26 54.0
16	57 29.7	-20 46.5	356 27.2	95 16.2	-21 46.2	271 47.7	26 53.9
18	87 29.3	-20 45.5	26 32.1	125 14.5	-21 46.8	301 53.6	26 53.8
20	117 28.9	-20 44.5	56 37.0	155 12.9	-21 47.4	331 59.5	26 53.8
22	147 28.5	-20 43.6	86 41.9	185 11.2	-21 48.0	2 5.4	26 53.7
Δ	-2	5		-8	-3	30	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	78 9.1	77	20 5.6	120	198 34.8	-23 7.7	315 37.7	10 14.8
2	107 2.5	75	20 29.6	118	228 38.5	-23 7.6	345 42.8	10 14.9
4	135 55.5	73	20 53.1	115	258 42.2	-23 7.6	15 48.0	10 15.0
6	164 48.1	71	21 16.2	113	288 45.9	-23 7.6	45 53.1	10 15.1
8	193 40.2	68	21 38.8	110	318 49.6	-23 7.5	75 58.3	10 15.2
10	222 31.9	66	22 .8	108	348 53.3	-23 7.5	106 3.5	10 15.3
12	251 23.1	64	22 22.3	105	18 57.1	-23 7.4	136 8.6	10 15.4
14	280 13.9	62	22 43.3	102	49 .8	-23 7.4	166 13.8	10 15.6
16	309 4.2	60	23 3.7	99	79 4.5	-23 7.3	196 18.9	10 15.7
18	337 54.1	57	23 23.6	96	109 8.2	-23 7.3	226 24.1	10 15.8
20	6 43.6	55	23 42.8	93	139 11.9	-23 7.2	256 29.2	10 15.9
22	35 32.7	53	24 1.5	90	169 15.6	-23 7.2	286 34.4	10 16.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 46	15 35	0 52	2 36	10 14	.4	3 39	4.7
55	8 14	16 6	0 43	2 12	10 51	1.1	3 4	4.0
50	7 52	16 29	0 37	1 56	11 17	1.4	2 39	3.6
45	7 34	16 46	0 33	1 44	11 38	1.6	2 20	3.4
40	7 20	17 1	0 30	1 35	11 54	1.8	2 4	3.2
35	7 7	17 13	0 27	1 29	12 9	1.9	1 51	3.0
30	6 56	17 24	0 26	1 24	12 21	2.0	1 40	2.9
20	6 38	17 42	0 24	1 17	12 42	2.2	1 21	2.7
10	6 22	17 58	0 22	1 14	13 1	2.4	1 4	2.6
0	6 6	18 14	0 22	1 14	13 18	2.5	0 49	2.4
10	5 51	18 29	0 23	1 16	13 36	2.6	0 33	2.2
20	5 34	18 46	0 24	1 22	13 55	2.8	0 17	2.1
30	5 15	19 5	0 27	1 33	14 17	2.9	. . ..	.0
35	5 3	19 16	0 29	1 42	14 30	3.1	. . ..	.0
40	4 50	19 29	0 31	1 55	14 45	3.2	. . ..	.0
45	4 35	19 45	0 35	2 16	15 2	3.3	23 54	1.9
50	4 15	20 4	0 41	3 5	15 25	3.6	23 30	1.7
55	3 50	20 28	0 51	: ::	15 54	3.9	22 59	1.4
60	3 15	21 4	1 13	: ::	16 38	4.7	22 13	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 9 47.5	-.8	16.3		19 32	2.5	59.4	16.2
12	- 9 57.5	$T_{\overline{m}_\odot}$	12 h 10.0 min	Starost	8.5 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 39	.1	100	-3.9	♃	10 44	.0	83	-1.7
♂	21 52	.2	275	-1.1	♄	2 57	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 28.1	-20 42.6	116 46.9	215 9.6	-21 48.5	32 11.3	26 53.6
2	207 27.7	-20 41.6	146 51.8	245 8.0	-21 49.1	62 17.2	26 53.6
4	237 27.3	-20 40.6	176 56.7	275 6.3	-21 49.7	92 23.0	26 53.5
6	267 26.9	-20 39.6	207 1.7	305 4.7	-21 50.3	122 28.9	26 53.4
8	297 26.4	-20 38.6	237 6.6	335 3.0	-21 50.8	152 34.8	26 53.3
10	327 26.0	-20 37.6	267 11.5	5 1.4	-21 51.4	182 40.6	26 53.3
12	357 25.6	-20 36.6	297 16.4	34 59.7	-21 51.9	212 46.5	26 53.2
14	27 25.2	-20 35.6	327 21.4	64 58.1	-21 52.5	242 52.3	26 53.1
16	57 24.8	-20 34.5	357 26.3	94 56.5	-21 53.0	272 58.2	26 53.1
18	87 24.4	-20 33.5	27 31.2	124 54.8	-21 53.6	303 4.0	26 53.0
20	117 24.0	-20 32.5	57 36.2	154 53.2	-21 54.1	333 9.8	26 52.9
22	147 23.6	-20 31.5	87 41.1	184 51.5	-21 54.6	3 15.7	26 52.8
Δ	-2	5		-8	-3	29	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	64 21.3	51	24 19.6	87	199 19.4	-23 7.1	316 39.6	10 16.1
2	93 9.6	49	24 37.0	84	229 23.1	-23 7.1	346 44.7	10 16.2
4	121 57.4	47	24 53.8	81	259 26.8	-23 7.0	16 49.9	10 16.3
6	150 44.8	45	25 9.9	77	289 30.5	-23 7.0	46 55.1	10 16.4
8	179 31.9	43	25 25.4	74	319 34.2	-23 6.9	77 .2	10 16.6
10	208 18.6	42	25 40.2	71	349 38.0	-23 6.9	107 5.4	10 16.7
12	237 4.9	40	25 54.3	67	19 41.7	-23 6.8	137 10.5	10 16.8
14	265 50.8	38	26 7.7	63	49 45.4	-23 6.7	167 15.7	10 16.9
16	294 36.5	37	26 20.3	60	79 49.1	-23 6.7	197 20.9	10 17.0
18	323 21.8	35	26 32.3	56	109 52.8	-23 6.6	227 26.0	10 17.1
20	352 6.8	34	26 43.5	52	139 56.6	-23 6.6	257 31.2	10 17.2
22	20 51.5	32	26 54.0	49	170 .3	-23 6.5	287 36.4	10 17.3
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 44	15 37	0 52	2 35	10 24	1.1	5 31	4.3
55	8 13	16 8	0 43	2 12	11 17	1.8	4 39	3.7
50	7 51	16 30	0 37	1 55	11 51	2.0	4 6	3.4
45	7 33	16 48	0 33	1 44	12 17	2.2	3 41	3.2
40	7 19	17 2	0 30	1 35	12 38	2.3	3 21	3.1
35	7 7	17 14	0 27	1 29	12 55	2.3	3 4	3.0
30	6 56	17 25	0 26	1 24	13 10	2.4	2 50	2.9
20	6 38	17 43	0 24	1 17	13 35	2.5	2 26	2.8
10	6 22	17 59	0 22	1 14	13 57	2.6	2 5	2.7
0	6 7	18 14	0 22	1 14	14 18	2.6	1 46	2.6
10	5 51	18 29	0 23	1 16	14 39	2.7	1 27	2.5
20	5 35	18 46	0 24	1 22	15 1	2.8	1 6	2.4
30	5 16	19 5	0 27	1 33	15 27	2.9	0 43	2.2
35	5 4	19 16	0 29	1 41	15 43	2.9	0 29	2.1
40	4 51	19 29	0 31	1 54	16 1	3.0	0 13	2.0
45	4 36	19 44	0 35	2 16	16 23	3.0	. . ..	.0
50	4 17	20 3	0 41	3 2	16 50	3.2	. . ..	.0
55	3 52	20 27	0 51	: ::	17 28	3.3	23 31	2.2
60	3 17	21 2	1 11	: ::	18 31	3.9	22 28	1.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	-10 7.5	-.8	16.3		20 33	2.7	59.7	16.3
12	-10 17.2	$T_{\overline{m}_\odot}$	12 h 10.3 min	Starost	9.5 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 40	.1	98	-3.9	♃	10 41	.0	83	-1.7
♂	21 47	.2	275	-1.0	♄	2 53	.0	200	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 23.3	-20 30.5	117 46.0	214 49.9	-21 55.1	33 21.5	26 52.8
2	207 22.9	-20 29.4	147 50.9	244 48.2	-21 55.7	63 27.3	26 52.7
4	237 22.5	-20 28.4	177 55.9	274 46.5	-21 56.2	93 33.1	26 52.6
6	267 22.1	-20 27.4	208 .8	304 44.9	-21 56.7	123 38.9	26 52.5
8	297 21.7	-20 26.4	238 5.7	334 43.2	-21 57.2	153 44.7	26 52.5
10	327 21.3	-20 25.3	268 10.7	4 41.6	-21 57.7	183 50.4	26 52.4
12	357 20.9	-20 24.3	298 15.6	34 39.9	-21 58.2	213 56.2	26 52.3
14	27 20.5	-20 23.2	328 20.5	64 38.3	-21 58.7	244 2.0	26 52.2
16	57 20.1	-20 22.2	358 25.4	94 36.6	-21 59.2	274 7.8	26 52.2
18	87 19.7	-20 21.1	28 30.4	124 34.9	-21 59.7	304 13.5	26 52.1
20	117 19.4	-20 20.1	58 35.3	154 33.3	-22 .2	334 19.3	26 52.0
22	147 19.0	-20 19.0	88 40.2	184 31.6	-22 .7	4 25.0	26 51.9
Δ	-2	5		-8	-2	29	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	49 36.0	31	27 3.7	45	200 4.0	-23 6.5	317 41.5	10 17.5
2	78 20.2	30	27 12.7	41	230 7.7	-23 6.4	347 46.7	10 17.6
4	107 4.2	29	27 20.8	37	260 11.5	-23 6.4	17 51.9	10 17.7
6	135 48.0	28	27 28.2	33	290 15.2	-23 6.3	47 57.0	10 17.8
8	164 31.5	27	27 34.9	29	320 18.9	-23 6.3	78 2.2	10 17.9
10	193 15.0	26	27 40.7	25	350 22.6	-23 6.2	108 7.4	10 18.0
12	221 58.2	26	27 45.7	21	20 26.4	-23 6.2	138 12.6	10 18.1
14	250 41.4	25	27 50.0	17	50 30.1	-23 6.1	168 17.7	10 18.3
16	279 24.4	25	27 53.4	13	80 33.8	-23 6.1	198 22.9	10 18.4
18	308 7.4	25	27 56.0	9	110 37.5	-23 6.0	228 28.1	10 18.5
20	336 50.3	24	27 57.8	5	140 41.3	-23 6.0	258 33.2	10 18.6
22	5 33.2	24	27 58.8	1	170 45.0	-23 5.9	288 38.4	10 18.7
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 42	15 40	0 52	2 35	10 51	2.7	7 15	3.0
55	8 12	16 10	0 42	2 11	11 59	2.7	6 7	2.9
50	7 50	16 32	0 37	1 55	12 40	2.7	5 27	2.8
45	7 33	16 49	0 32	1 44	13 9	2.7	4 58	2.8
40	7 19	17 3	0 30	1 35	13 32	2.7	4 35	2.8
35	7 7	17 15	0 27	1 29	13 51	2.7	4 16	2.8
30	6 56	17 25	0 26	1 24	14 7	2.7	4 0	2.8
20	6 38	17 43	0 23	1 17	14 35	2.7	3 33	2.7
10	6 22	17 59	0 22	1 14	14 59	2.7	3 10	2.7
0	6 7	18 14	0 22	1 13	15 21	2.7	2 48	2.7
10	5 52	18 29	0 23	1 16	15 44	2.7	2 26	2.6
20	5 35	18 46	0 24	1 21	16 8	2.6	2 3	2.6
30	5 17	19 4	0 27	1 32	16 36	2.6	1 36	2.6
35	5 5	19 15	0 29	1 41	16 53	2.6	1 20	2.5
40	4 53	19 28	0 31	1 54	17 12	2.6	1 1	2.5
45	4 37	19 43	0 35	2 15	17 36	2.5	0 39	2.4
50	4 19	20 2	0 41	2 59	18 6	2.5	0 11	2.4
55	3 54	20 26	0 50	: ::	18 49	2.4	. . ..	.0
60	3 20	20 60	1 10	: ::	20 4	2.0	23 9	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-10 26.8	-.8	16.3	$T_{\overline{m}}$ 21 37	2.7	59.8	16.3
12	-10 36.1	$T_{\overline{m}_\odot}$ 12 h 10.6 min		Starost 10.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 41	.1	97	-3.9	♄	10 38	.0	82	-1.7
♂	21 42	.2	276	-1.0	♃	2 49	.0	200	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 18.6	-20 18.0	118 45.2	214 29.9	-22 1.1	34 30.7	26 51.9
2	207 18.2	-20 16.9	148 50.1	244 28.3	-22 1.6	64 36.5	26 51.8
4	237 17.8	-20 15.9	178 55.0	274 26.6	-22 2.1	94 42.2	26 51.7
6	267 17.5	-20 14.8	208 59.9	304 24.9	-22 2.5	124 47.9	26 51.6
8	297 17.1	-20 13.7	239 4.9	334 23.3	-22 3.0	154 53.6	26 51.6
10	327 16.7	-20 12.7	269 9.8	4 21.6	-22 3.4	184 59.3	26 51.5
12	357 16.4	-20 11.6	299 14.7	34 19.9	-22 3.9	215 5.0	26 51.4
14	27 16.0	-20 10.5	329 19.6	64 18.3	-22 4.3	245 10.7	26 51.3
16	57 15.6	-20 9.5	359 24.6	94 16.6	-22 4.8	275 16.4	26 51.3
18	87 15.2	-20 8.4	29 29.5	124 14.9	-22 5.2	305 22.1	26 51.2
20	117 14.9	-20 7.3	59 34.4	154 13.2	-22 5.6	335 27.8	26 51.1
22	147 14.5	-20 6.2	89 39.4	184 11.6	-22 6.0	5 33.4	26 51.0
Δ	-2	5		-8	-2	28	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	34 16.1	25	27 59.0	-3	200 48.7	-23 5.9	318 43.6	10 18.8
2	62 59.0	25	27 58.4	-7	230 52.4	-23 5.8	348 48.8	10 19.0
4	91 41.9	25	27 56.9	-11	260 56.2	-23 5.7	18 53.9	10 19.1
6	120 25.0	26	27 54.7	-15	290 59.9	-23 5.7	48 59.1	10 19.2
8	149 8.1	26	27 51.6	-19	321 3.6	-23 5.6	79 4.3	10 19.3
10	177 51.3	27	27 47.8	-23	351 7.3	-23 5.6	109 9.5	10 19.4
12	206 34.7	28	27 43.1	-27	21 11.1	-23 5.5	139 14.6	10 19.5
14	235 18.2	29	27 37.7	-31	51 14.8	-23 5.5	169 19.8	10 19.7
16	264 2.0	30	27 31.5	-35	81 18.5	-23 5.4	199 25.0	10 19.8
18	292 45.9	31	27 24.4	-39	111 22.3	-23 5.4	229 30.2	10 19.9
20	321 30.1	32	27 16.7	-43	141 26.0	-23 5.3	259 35.4	10 20.0
22	350 14.5	33	27 8.1	-47	171 29.7	-23 5.3	289 40.5	10 20.1
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 40	15 42	0 51	2 34	11 55	4.2	8 26	1.3
55	8 11	16 12	0 42	2 11	13 4	3.6	7 16	1.9
50	7 49	16 33	0 36	1 55	13 45	3.3	6 35	2.1
45	7 32	16 50	0 32	1 43	14 14	3.2	6 5	2.2
40	7 18	17 4	0 29	1 35	14 37	3.0	5 42	2.3
35	7 6	17 16	0 27	1 28	14 56	3.0	5 23	2.4
30	6 56	17 26	0 26	1 24	15 13	2.9	5 6	2.4
20	6 38	17 44	0 23	1 17	15 40	2.8	4 39	2.5
10	6 22	17 60	0 22	1 14	16 4	2.7	4 15	2.6
0	6 7	18 15	0 22	1 13	16 26	2.6	3 52	2.6
10	5 52	18 29	0 23	1 16	16 48	2.5	3 30	2.7
20	5 36	18 45	0 24	1 21	17 11	2.4	3 6	2.8
30	5 17	19 4	0 26	1 32	17 39	2.3	2 37	2.8
35	5 6	19 15	0 28	1 41	17 55	2.2	2 21	2.9
40	4 54	19 28	0 31	1 53	18 14	2.1	2 1	2.9
45	4 39	19 42	0 35	2 14	18 36	1.9	1 38	3.0
50	4 20	20 1	0 41	2 56	19 5	1.8	1 7	3.1
55	3 56	20 25	0 50	: ::	19 45	1.4	0 25	3.2
60	3 22	20 58	1 9	: ::	20 51	.7	. . ..	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-10 45.4	-.7	16.3	$T_{\overline{m}}$ 22 41	2.5	59.8	16.3
12	-10 54.3	$T_{\overline{m}_\odot}$ 12 h 10.9 min		Starost 11.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 43	.1	96	-3.9	♄	10 35	.0	82	-1.7
♂	21 38	.2	276	-1.0	♃	2 45	.0	200	.5

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	14.1	-20	5.1	119	44.3	214	9.9	-22	6.5	35	39.1	26	50.9
2	207	13.8	-20	4.0	149	49.2	244	8.2	-22	6.9	65	44.8	26	50.9
4	237	13.4	-20	2.9	179	54.1	274	6.5	-22	7.3	95	50.4	26	50.8
6	267	13.1	-20	1.9	209	59.1	304	4.9	-22	7.7	125	56.1	26	50.7
8	297	12.7	-20	.8	240	4.0	334	3.2	-22	8.1	156	1.7	26	50.6
10	327	12.3	-19	59.7	270	8.9	4	1.5	-22	8.5	186	7.3	26	50.6
12	357	12.0	-19	58.6	300	13.9	33	59.8	-22	8.9	216	12.9	26	50.5
14	27	11.6	-19	57.5	330	18.8	63	58.1	-22	9.3	246	18.6	26	50.4
16	57	11.3	-19	56.3	0	23.7	93	56.5	-22	9.7	276	24.2	26	50.3
18	87	10.9	-19	55.2	30	28.6	123	54.8	-22	10.1	306	29.8	26	50.2
20	117	10.6	-19	54.1	60	33.6	153	53.1	-22	10.4	336	35.4	26	50.2
22	147	10.2	-19	53.0	90	38.5	183	51.4	-22	10.8	6	41.0	26	50.1
Δ		-2		6				-8		-2		28		0

UT	MESEC				JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	18	59.2	35	26	58.8	-50	201	33.4	-23	5.2	319	45.7	10	20.3
2	47	44.1	36	26	48.7	-54	231	37.2	-23	5.1	349	50.9	10	20.4
4	76	29.4	38	26	37.9	-58	261	40.9	-23	5.1	19	56.1	10	20.5
6	105	15.0	40	26	26.4	-61	291	44.6	-23	5.0	50	1.3	10	20.6
8	134	1.0	42	26	14.2	-65	321	48.4	-23	5.0	80	6.5	10	20.7
10	162	47.3	43	26	1.2	-68	351	52.1	-23	4.9	110	11.6	10	20.8
12	191	34.0	45	25	47.6	-72	21	55.8	-23	4.9	140	16.8	10	21.0
14	220	21.1	47	25	33.3	-75	51	59.6	-23	4.8	170	22.0	10	21.1
16	249	8.6	50	25	18.3	-78	82	3.3	-23	4.8	200	27.2	10	21.2
18	277	56.5	52	25	2.6	-81	112	7.0	-23	4.7	230	32.4	10	21.3
20	306	44.8	54	24	46.4	-85	142	10.8	-23	4.6	260	37.6	10	21.4
22	335	33.6	56	24	29.4	-88	172	14.5	-23	4.6	290	42.8	10	21.6
Δ								19		0		26		1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 39	15 44	0 51	2 34	13 36	4.6	8 57	.5
55	8 9	16 14	0 42	2 10	14 30	3.9	8 1	1.1
50	7 48	16 35	0 36	1 55	15 4	3.6	7 26	1.5
45	7 31	16 52	0 32	1 43	15 30	3.3	6 59	1.7
40	7 18	17 5	0 29	1 35	15 50	3.1	6 38	1.9
35	7 6	17 17	0 27	1 28	16 7	3.0	6 20	2.0
30	6 56	17 27	0 26	1 23	16 22	2.9	6 5	2.1
20	6 38	17 45	0 23	1 17	16 47	2.7	5 39	2.2
10	6 22	18 0	0 22	1 14	17 8	2.5	5 17	2.4
0	6 8	18 15	0 22	1 13	17 28	2.4	4 56	2.5
10	5 53	18 30	0 22	1 15	17 47	2.2	4 35	2.6
20	5 37	18 45	0 24	1 21	18 8	2.1	4 12	2.8
30	5 18	19 4	0 26	1 32	18 33	1.9	3 45	2.9
35	5 7	19 15	0 28	1 40	18 47	1.8	3 29	3.0
40	4 55	19 27	0 31	1 53	19 3	1.6	3 11	3.1
45	4 40	19 42	0 35	2 13	19 23	1.5	2 49	3.3
50	4 22	19 60	0 40	2 53	19 47	1.2	2 21	3.5
55	3 58	20 23	0 49	: ::	20 20	.9	1 42	3.8
60	3 25	20 56	1 8	: ::	21 7	.3	0 37	4.6
S								

SUNCE				MESEC				
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	-11 3.2	-.7	16.3	$T_{\overline{m}}$	23 42	2.3	59.6	16.2
12	-11 11.8	$T_{\overline{m}_\odot}$ 12 h 11.2 min		Starost 12.5 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 44	.1	94	-3.9	♃	10 32	.0	82	-1.7
♂	21 33	.2	276	-.9	♄	2 40	.0	200	.5

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	177	9.9	-19	51.9	120	43.4	213	49.7	-22	11.2	36	46.6	26	50.0
2	207	9.5	-19	50.8	150	48.4	243	48.0	-22	11.5	66	52.1	26	49.9
4	237	9.2	-19	49.7	180	53.3	273	46.3	-22	11.9	96	57.7	26	49.8
6	267	8.8	-19	48.5	210	58.2	303	44.6	-22	12.3	127	3.3	26	49.8
8	297	8.5	-19	47.4	241	3.1	333	43.0	-22	12.6	157	8.8	26	49.7
10	327	8.2	-19	46.3	271	8.1	3	41.3	-22	12.9	187	14.4	26	49.6
12	357	7.8	-19	45.1	301	13.0	33	39.6	-22	13.3	217	19.9	26	49.5
14	27	7.5	-19	44.0	331	17.9	63	37.9	-22	13.6	247	25.5	26	49.4
16	57	7.1	-19	42.9	1	22.9	93	36.2	-22	14.0	277	31.0	26	49.4
18	87	6.8	-19	41.7	31	27.8	123	34.5	-22	14.3	307	36.5	26	49.3
20	117	6.5	-19	40.6	61	32.7	153	32.8	-22	14.6	337	42.1	26	49.2
22	147	6.1	-19	39.4	91	37.6	183	31.1	-22	14.9	7	47.6	26	49.1
Δ		-2		6				-8		-2		28		0

UT	MESEC				JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	S_{4}		δ_{4}		S_{5}		δ_{5}	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	4	22.8	58	24	11.9	-91	202	18.2	-23	4.5	320	47.9	10	21.7
2	33	12.5	61	23	53.8	-93	232	22.0	-23	4.5	350	53.1	10	21.8
4	62	2.6	63	23	35.1	-96	262	25.7	-23	4.4	20	58.3	10	21.9
6	90	53.2	65	23	15.9	-99	292	29.4	-23	4.4	51	3.5	10	22.1
8	119	44.2	68	22	56.0	-102	322	33.2	-23	4.3	81	8.7	10	22.2
10	148	35.8	70	22	35.7	-104	352	36.9	-23	4.2	111	13.9	10	22.3
12	177	27.8	73	22	14.8	-107	22	40.6	-23	4.2	141	19.1	10	22.4
14	206	20.3	75	21	53.4	-109	52	44.4	-23	4.1	171	24.3	10	22.5
16	235	13.3	77	21	31.6	-112	82	48.1	-23	4.1	201	29.5	10	22.7
18	264	6.8	80	21	9.2	-114	112	51.8	-23	4.0	231	34.7	10	22.8
20	293	.7	82	20	46.4	-116	142	55.6	-23	4.0	261	39.8	10	22.9
22	321	55.2	85	20	23.2	-118	172	59.3	-23	3.9	291	45.0	10	23.0
Δ								19		0		26		1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 37	15 47	0 51	2 33	15 26	4.4	9 8	.2
55	8 8	16 16	0 42	2 10	16 3	3.9	8 29	.7
50	7 47	16 36	0 36	1 54	16 30	3.5	8 1	1.0
45	7 30	16 53	0 32	1 43	16 50	3.3	7 40	1.3
40	7 17	17 6	0 29	1 35	17 6	3.1	7 22	1.5
35	7 5	17 18	0 27	1 28	17 20	2.9	7 8	1.6
30	6 55	17 28	0 26	1 23	17 31	2.8	6 55	1.7
20	6 38	17 45	0 23	1 17	17 51	2.6	6 33	1.9
10	6 22	18 1	0 22	1 14	18 9	2.4	6 14	2.1
0	6 8	18 15	0 22	1 13	18 25	2.2	5 56	2.3
10	5 53	18 30	0 22	1 15	18 41	2.0	5 37	2.5
20	5 37	18 45	0 24	1 21	18 58	1.8	5 18	2.6
30	5 19	19 3	0 26	1 31	19 18	1.6	4 55	2.9
35	5 8	19 14	0 28	1 40	19 30	1.5	4 42	3.0
40	4 56	19 26	0 31	1 52	19 43	1.3	4 26	3.1
45	4 41	19 41	0 35	2 12	19 58	1.1	4 8	3.3
50	4 23	19 59	0 40	2 51	20 17	.9	3 45	3.6
55	4 0	20 22	0 49	: ::	20 41	.6	3 13	3.9
60	3 28	20 54	1 7	: ::	21 13	.1	2 27	4.6
S								

SUNCE				MESEC				
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	-11 20.3	-.7	16.3	$T_{\overline{m}}$	. . .	1.0	59.2	16.1
12	-11 28.5	$T_{\overline{m}_\odot}$ 12 h 11.5 min		Starost 13.5 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 45	.1	93	-3.9	♃	10 29	.0	82	-1.7
♂	21 29	.2	276	-.9	♄	2 36	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 5.8	-19 38.3	121 42.6	213 29.4	-22 15.2	37 53.1	26 49.0
2	207 5.5	-19 37.1	151 47.5	243 27.7	-22 15.5	67 58.6	26 49.0
4	237 5.1	-19 36.0	181 52.4	273 26.0	-22 15.9	98 4.1	26 48.9
6	267 4.8	-19 34.8	211 57.4	303 24.3	-22 16.2	128 9.6	26 48.8
8	297 4.5	-19 33.7	242 2.3	333 22.6	-22 16.4	158 15.1	26 48.7
10	327 4.2	-19 32.5	272 7.2	3 20.9	-22 16.7	188 20.5	26 48.6
12	357 3.8	-19 31.4	302 12.1	33 19.2	-22 17.0	218 26.0	26 48.6
14	27 3.5	-19 30.2	332 17.1	63 17.5	-22 17.3	248 31.5	26 48.5
16	57 3.2	-19 29.0	2 22.0	93 15.8	-22 17.6	278 36.9	26 48.4
18	87 2.9	-19 27.9	32 26.9	123 14.1	-22 17.9	308 42.4	26 48.3
20	117 2.6	-19 26.7	62 31.9	153 12.4	-22 18.1	338 47.8	26 48.2
22	147 2.2	-19 25.5	92 36.8	183 10.7	-22 18.4	8 53.3	26 48.1
Δ	-2	6		-9	-1	27	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	350 50.1	87	19 59.5	-120	203 3.0	-23 3.8	321 50.2	10 23.2
2	19 45.5	89	19 35.5	-122	233 6.8	-23 3.8	351 55.4	10 23.3
4	48 41.4	92	19 11.0	-124	263 10.5	-23 3.7	22 .6	10 23.4
6	77 37.8	94	18 46.1	-126	293 14.3	-23 3.7	52 5.8	10 23.5
8	106 34.6	97	18 20.9	-128	323 18.0	-23 3.6	82 11.0	10 23.7
10	135 31.9	99	17 55.3	-130	353 21.7	-23 3.5	112 16.2	10 23.8
12	164 29.7	101	17 29.4	-131	23 25.5	-23 3.5	142 21.4	10 23.9
14	193 27.9	103	17 3.2	-133	53 29.2	-23 3.4	172 26.6	10 24.0
16	222 26.6	106	16 36.7	-134	83 33.0	-23 3.4	202 31.8	10 24.1
18	251 25.7	108	16 9.9	-135	113 36.7	-23 3.3	232 37.0	10 24.3
20	280 25.3	110	15 42.8	-137	143 40.4	-23 3.2	262 42.2	10 24.4
22	309 25.3	112	15 15.4	-138	173 44.2	-23 3.2	292 47.4	10 24.5
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 35	15 49	0 50	2 32	17 12	4.1	9 13	.1
55	8 7	16 17	0 42	2 10	17 36	3.7	8 46	.5
50	7 46	16 38	0 36	1 54	17 54	3.3	8 26	.8
45	7 30	16 54	0 32	1 43	18 8	3.1	8 11	1.0
40	7 16	17 8	0 29	1 34	18 20	2.9	7 57	1.2
35	7 5	17 19	0 27	1 28	18 29	2.8	7 46	1.3
30	6 55	17 29	0 26	1 23	18 38	2.6	7 37	1.5
20	6 38	17 46	0 23	1 17	18 53	2.4	7 20	1.7
10	6 22	18 1	0 22	1 13	19 6	2.2	7 5	1.9
0	6 8	18 15	0 22	1 13	19 17	2.0	6 51	2.1
10	5 54	18 30	0 22	1 15	19 29	1.8	6 37	2.3
20	5 38	18 45	0 24	1 21	19 42	1.6	6 21	2.5
30	5 20	19 3	0 26	1 31	19 56	1.4	6 4	2.7
35	5 9	19 14	0 28	1 40	20 5	1.2	5 53	2.8
40	4 57	19 26	0 31	1 52	20 14	1.1	5 42	3.0
45	4 43	19 40	0 35	2 11	20 25	.9	5 28	3.2
50	4 25	19 57	0 40	2 48	20 38	.7	5 10	3.4
55	4 2	20 20	0 48	: ::	20 54	.4	4 48	3.8
60	3 30	20 52	1 6	: ::	21 16	.0	4 17	4.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-11 36.6	-.6	16.3	$T_{\overline{m}}$ 0 38	2.1	58.6	16.0
12	-11 44.4	$T_{\overline{m}_\odot}$ 12 h 11.7 min		Starost 14.5 d		Faza ○	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 47	.1	92	-3.9	♃	10 26	.0	81	-1.7
♂	21 25	.2	276	-.9	♄	2 32	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 1.9	-19 24.3	122 41.7	213 9.0	-22 18.7	38 58.7	26 48.1
2	207 1.6	-19 23.1	152 46.6	243 7.3	-22 18.9	69 4.1	26 48.0
4	237 1.3	-19 22.0	182 51.6	273 5.6	-22 19.2	99 9.6	26 47.9
6	267 1.0	-19 20.8	212 56.5	303 3.9	-22 19.4	129 15.0	26 47.8
8	297 .7	-19 19.6	243 1.4	333 2.2	-22 19.6	159 20.4	26 47.7
10	327 .4	-19 18.4	273 6.3	3 .5	-22 19.9	189 25.8	26 47.7
12	357 .1	-19 17.2	303 11.3	32 58.8	-22 20.1	219 31.2	26 47.6
14	26 59.7	-19 16.0	333 16.2	62 57.0	-22 20.3	249 36.6	26 47.5
16	56 59.4	-19 14.8	3 21.1	92 55.3	-22 20.6	279 42.0	26 47.4
18	86 59.1	-19 13.6	33 26.1	122 53.6	-22 20.8	309 47.4	26 47.3
20	116 58.8	-19 12.4	63 31.0	152 51.9	-22 21.0	339 52.7	26 47.2
22	146 58.5	-19 11.2	93 35.9	182 50.2	-22 21.2	9 58.1	26 47.2
Δ	-2	6		-9	-1	27	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 25.7	114	14 47.8	-139	203 47.9	-23 3.1	322 52.6	10 24.6
2	7 26.5	116	14 19.9	-140	233 51.7	-23 3.1	352 57.8	10 24.8
4	36 27.8	118	13 51.9	-141	263 55.4	-23 3.0	23 3.0	10 24.9
6	65 29.4	120	13 23.6	-142	293 59.1	-23 2.9	53 8.2	10 25.0
8	94 31.5	122	12 55.1	-143	324 2.9	-23 2.9	83 13.4	10 25.2
10	123 33.9	124	12 26.4	-144	354 6.6	-23 2.8	113 18.6	10 25.3
12	152 36.7	126	11 57.6	-145	24 10.4	-23 2.8	143 23.8	10 25.4
14	181 39.9	128	11 28.6	-146	54 14.1	-23 2.7	173 29.0	10 25.5
16	210 43.4	129	10 59.5	-146	84 17.9	-23 2.6	203 34.2	10 25.7
18	239 47.3	131	10 30.2	-147	114 21.6	-23 2.6	233 39.4	10 25.8
20	268 51.5	133	10 .8	-148	144 25.3	-23 2.5	263 44.6	10 25.9
22	297 56.0	134	9 31.3	-148	174 29.1	-23 2.5	293 49.8	10 26.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 33	15 52	0 50	2 32	18 50	3.8	9 15	.0
55	8 5	16 19	0 41	2 9	19 4	3.5	8 58	.4
50	7 45	16 40	0 36	1 54	19 14	3.2	8 45	.6
45	7 29	16 56	0 32	1 43	19 23	3.0	8 35	.8
40	7 16	17 9	0 29	1 34	19 30	2.8	8 26	1.0
35	7 4	17 20	0 27	1 28	19 36	2.6	8 19	1.2
30	6 55	17 30	0 25	1 23	19 41	2.5	8 12	1.3
20	6 38	17 47	0 23	1 17	19 50	2.2	8 0	1.5
10	6 23	18 2	0 22	1 13	19 58	2.0	7 50	1.7
0	6 8	18 16	0 22	1 13	20 5	1.8	7 41	1.9
10	5 54	18 30	0 22	1 15	20 13	1.7	7 31	2.1
20	5 39	18 45	0 24	1 21	20 20	1.5	7 21	2.3
30	5 21	19 3	0 26	1 31	20 29	1.2	7 9	2.6
35	5 11	19 13	0 28	1 39	20 34	1.1	7 2	2.7
40	4 59	19 25	0 31	1 51	20 40	1.0	6 54	2.8
45	4 44	19 39	0 34	2 10	20 47	.8	6 44	3.0
50	4 27	19 56	0 40	2 46	20 54	.6	6 33	3.3
55	4 4	20 19	0 48	: ::	21 4	.3	6 19	3.6
60	3 33	20 49	1 5	: ::	21 16	.0	5 60	4.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-11 52.1	-.6	16.3	$T_{\overline{m}}$ 1 29	2.0	57.9	15.8
12	-11 59.5	$T_{\overline{m}_\odot}$ 12 h 12.0 min		Starost 15.5 d		Faza ○	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 48	.1	90	-3.9	♃	10 24	.0	81	-1.7
♂	21 20	.2	276	-.8	♄	2 28	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 58.2	-19 10.0	123 40.8	212 48.5	-22 21.4	40 3.4	26 47.1
2	206 57.9	-19 8.8	153 45.8	242 46.8	-22 21.6	70 8.8	26 47.0
4	236 57.6	-19 7.6	183 50.7	272 45.1	-22 21.8	100 14.1	26 46.9
6	266 57.3	-19 6.4	213 55.6	302 43.3	-22 22.0	130 19.5	26 46.8
8	296 57.0	-19 5.1	244 .6	332 41.6	-22 22.2	160 24.8	26 46.8
10	326 56.8	-19 3.9	274 5.5	2 39.9	-22 22.4	190 30.2	26 46.7
12	356 56.5	-19 2.7	304 10.4	32 38.2	-22 22.6	220 35.5	26 46.6
14	26 56.2	-19 1.5	334 15.3	62 36.5	-22 22.7	250 40.8	26 46.5
16	56 55.9	-19 .3	4 20.3	92 34.8	-22 22.9	280 46.1	26 46.4
18	86 55.6	-18 59.0	34 25.2	122 33.1	-22 23.1	310 51.4	26 46.3
20	116 55.3	-18 57.8	64 30.1	152 31.3	-22 23.2	340 56.7	26 46.3
22	146 55.0	-18 56.6	94 35.1	182 29.6	-22 23.4	11 2.0	26 46.2
Δ	-1	6		-9	-1	27	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	327 .8	136	9 1.6	-149	204 32.8	-23 2.4	323 55.0	10 26.2
2	356 6.0	137	8 31.9	-149	234 36.6	-23 2.3	354 .3	10 26.3
4	25 11.5	139	8 2.2	-149	264 40.3	-23 2.3	24 5.5	10 26.4
6	54 17.2	140	7 32.3	-150	294 44.1	-23 2.2	54 10.7	10 26.6
8	83 23.2	141	7 2.4	-150	324 47.8	-23 2.1	84 15.9	10 26.7
10	112 29.5	143	6 32.4	-150	354 51.6	-23 2.1	114 21.1	10 26.8
12	141 36.1	144	6 2.4	-150	24 55.3	-23 2.0	144 26.3	10 26.9
14	170 42.9	145	5 32.3	-150	54 59.1	-23 2.0	174 31.5	10 27.1
16	199 49.9	146	5 2.3	-150	85 2.8	-23 1.9	204 36.7	10 27.2
18	228 57.2	147	4 32.2	-150	115 6.5	-23 1.8	234 41.9	10 27.3
20	258 4.7	148	4 2.1	-150	145 10.3	-23 1.8	264 47.1	10 27.5
22	287 12.4	149	3 32.0	-150	175 14.0	-23 1.7	294 52.4	10 27.6
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 31	15 54	0 50	2 31	20 21	3.6	9 15	.0
55	8 4	16 21	0 41	2 9	20 27	3.3	9 7	.3
50	7 44	16 41	0 36	1 54	20 30	3.0	9 0	.5
45	7 28	16 57	0 32	1 42	20 34	2.8	8 55	.7
40	7 15	17 10	0 29	1 34	20 36	2.7	8 50	.9
35	7 4	17 21	0 27	1 28	20 38	2.5	8 47	1.1
30	6 54	17 31	0 25	1 23	20 40	2.4	8 43	1.2
20	6 37	17 47	0 23	1 16	20 44	2.1	8 37	1.4
10	6 23	18 2	0 22	1 13	20 47	1.9	8 32	1.6
0	6 9	18 16	0 22	1 13	20 50	1.8	8 27	1.8
10	5 55	18 30	0 22	1 15	20 52	1.6	8 22	2.0
20	5 39	18 45	0 24	1 20	20 55	1.4	8 16	2.2
30	5 22	19 2	0 26	1 31	20 59	1.2	8 10	2.4
35	5 12	19 12	0 28	1 39	21 1	1.0	8 6	2.6
40	4 60	19 24	0 31	1 51	21 3	.9	8 2	2.7
45	4 46	19 38	0 34	2 9	21 5	.7	7 57	2.9
50	4 28	19 55	0 39	2 43	21 8	.5	7 51	3.1
55	4 6	20 17	0 48	: ::	21 12	.3	7 44	3.4
60	3 35	20 47	1 4	: ::	21 16	.0	7 35	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 6.9	-.6	16.3	$T_{\overline{m}}$ 2 16	1.8	57.2	15.6
12	-12 13.9	$T_{\overline{m}_\odot}$ 12 h 12.2 min		Starost 16.5 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 49	.1	89	-3.9	♃	10 21	.0	81	-1.7
♂	21 16	.2	276	-.8	♄	2 24	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 54.7	-18 55.3	124 40.0	212 27.9	-22 23.5	41 7.3	26 46.1
2	206 54.5	-18 54.1	154 44.9	242 26.2	-22 23.7	71 12.6	26 46.0
4	236 54.2	-18 52.8	184 49.8	272 24.5	-22 23.8	101 17.8	26 45.9
6	266 53.9	-18 51.6	214 54.8	302 22.7	-22 23.9	131 23.1	26 45.8
8	296 53.6	-18 50.4	244 59.7	332 21.0	-22 24.1	161 28.4	26 45.8
10	326 53.3	-18 49.1	275 4.6	2 19.3	-22 24.2	191 33.6	26 45.7
12	356 53.1	-18 47.9	305 9.6	32 17.6	-22 24.3	221 38.9	26 45.6
14	26 52.8	-18 46.6	335 14.5	62 15.9	-22 24.4	251 44.1	26 45.5
16	56 52.5	-18 45.3	5 19.4	92 14.1	-22 24.6	281 49.3	26 45.4
18	86 52.2	-18 44.1	35 24.3	122 12.4	-22 24.7	311 54.6	26 45.3
20	116 52.0	-18 42.8	65 29.3	152 10.7	-22 24.8	341 59.8	26 45.3
22	146 51.7	-18 41.6	95 34.2	182 9.0	-22 24.9	12 5.0	26 45.2
Δ	-1	6		-9	-1	26	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	316 20.3	150	3 2.0	-150	205 17.8	-23 1.6	324 57.6	10 27.7
2	345 28.4	151	2 31.9	-150	235 21.5	-23 1.6	355 2.8	10 27.8
4	14 36.6	152	2 1.9	-150	265 25.3	-23 1.5	25 8.0	10 28.0
6	43 45.0	153	1 31.9	-150	295 29.0	-23 1.5	55 13.2	10 28.1
8	72 53.6	154	1 2.0	-149	325 32.8	-23 1.4	85 18.4	10 28.2
10	102 2.4	154	0 32.1	-149	355 36.5	-23 1.3	115 23.6	10 28.4
12	131 11.2	155	0 2.3	-149	25 40.3	-23 1.3	145 28.8	10 28.5
14	160 20.2	156	- 0 27.5	-148	55 44.0	-23 1.2	175 34.1	10 28.6
16	189 29.4	156	- 0 57.1	-148	85 47.8	-23 1.1	205 39.3	10 28.8
18	218 38.6	157	- 1 26.7	-148	115 51.6	-23 1.1	235 44.5	10 28.9
20	247 47.9	157	- 1 56.3	-147	145 55.3	-23 1.0	265 49.7	10 29.0
22	276 57.3	157	- 2 25.7	-147	175 59.1	-23 .9	295 54.9	10 29.2
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 29	15 57	0 49	2 31	21 49	3.6	9 15	.0
55	8 2	16 23	0 41	2 9	21 46	3.2	9 14	.3
50	7 42	16 43	0 36	1 53	21 43	3.0	9 13	.5
45	7 27	16 58	0 32	1 42	21 42	2.8	9 13	.7
40	7 14	17 11	0 29	1 34	21 40	2.6	9 12	.9
35	7 3	17 22	0 27	1 28	21 39	2.4	9 12	1.0
30	6 54	17 31	0 25	1 23	21 37	2.3	9 12	1.1
20	6 37	17 48	0 23	1 16	21 35	2.1	9 11	1.4
10	6 23	18 2	0 22	1 13	21 34	1.9	9 10	1.6
0	6 9	18 16	0 22	1 13	21 32	1.7	9 10	1.7
10	5 55	18 30	0 22	1 15	21 30	1.5	9 9	1.9
20	5 40	18 45	0 24	1 20	21 28	1.4	9 9	2.1
30	5 23	19 2	0 26	1 30	21 26	1.1	9 8	2.3
35	5 13	19 12	0 28	1 38	21 25	1.0	9 8	2.5
40	5 1	19 23	0 31	1 50	21 24	.9	9 7	2.6
45	4 47	19 37	0 34	2 8	21 23	.7	9 7	2.8
50	4 30	19 54	0 39	2 41	21 21	.5	9 6	3.0
55	4 8	20 15	0 47	: ::	21 19	.3	9 5	3.3
60	3 38	20 45	1 3	: ::	21 16	.0	9 4	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 20.9	-.5	16.3	$T_{\overline{m}}$ 2 60	1.8	56.4	15.4
12	-12 27.5	$T_{\overline{m}_\odot}$ 12 h 12.5 min		Starost 17.5 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 51	.1	88	-3.9	♃	10 18	.0	81	-1.7
♂	21 12	.2	276	-.8	♄	2 20	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 51.4	-18 40.3	125 39.1	212 7.2	-22 25.0	42 10.2	26 45.1
2	206 51.2	-18 39.0	155 44.1	242 5.5	-22 25.1	72 15.4	26 45.0
4	236 50.9	-18 37.8	185 49.0	272 3.8	-22 25.1	102 20.6	26 44.9
6	266 50.6	-18 36.5	215 53.9	302 2.1	-22 25.2	132 25.8	26 44.9
8	296 50.4	-18 35.2	245 58.8	332 .3	-22 25.3	162 31.0	26 44.8
10	326 50.1	-18 33.9	276 3.8	1 58.6	-22 25.4	192 36.2	26 44.7
12	356 49.9	-18 32.7	306 8.7	31 56.9	-22 25.4	222 41.4	26 44.6
14	26 49.6	-18 31.4	336 13.6	61 55.2	-22 25.5	252 46.5	26 44.5
16	56 49.4	-18 30.1	6 18.5	91 53.4	-22 25.6	282 51.7	26 44.4
18	86 49.1	-18 28.8	36 23.5	121 51.7	-22 25.6	312 56.9	26 44.4
20	116 48.8	-18 27.5	66 28.4	151 50.0	-22 25.7	343 2.0	26 44.3
22	146 48.6	-18 26.2	96 33.3	181 48.3	-22 25.7	13 7.2	26 44.2
Δ	-1	6		-9	0	26	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	306 6.8	158	-2 55.0	-146	206 2.8	-23 .9	326 .2	10 29.3
2	335 16.4	158	-3 24.2	-145	236 6.6	-23 .8	356 5.4	10 29.4
4	4 26.0	158	-3 53.3	-145	266 10.3	-23 .7	26 10.6	10 29.5
6	33 35.7	159	-4 22.3	-144	296 14.1	-23 .7	56 15.8	10 29.7
8	62 45.4	159	-4 51.1	-144	326 17.8	-23 .6	86 21.0	10 29.8
10	91 55.2	159	-5 19.8	-143	356 21.6	-23 .6	116 26.2	10 29.9
12	121 5.0	159	-5 48.4	-142	26 25.3	-23 .5	146 31.5	10 30.1
14	150 14.8	159	-6 16.8	-141	56 29.1	-23 .4	176 36.7	10 30.2
16	179 24.6	159	-6 45.1	-141	86 32.9	-23 .4	206 41.9	10 30.3
18	208 34.4	159	-7 13.2	-140	116 36.6	-23 .3	236 47.1	10 30.5
20	237 44.2	159	-7 41.2	-139	146 40.4	-23 .2	266 52.4	10 30.6
22	266 54.0	159	-8 9.0	-138	176 44.1	-23 .2	296 57.6	10 30.7
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 27	15 60	0 49	2 30	23 14	3.6	9 14	.0
55	8 1	16 25	0 41	2 8	23 3	3.2	9 21	.3
50	7 41	16 45	0 36	1 53	22 55	2.9	9 26	.5
45	7 26	16 60	0 32	1 42	22 48	2.7	9 30	.7
40	7 13	17 12	0 29	1 34	22 42	2.6	9 33	.9
35	7 3	17 23	0 27	1 27	22 37	2.4	9 36	1.0
30	6 53	17 32	0 25	1 23	22 33	2.3	9 39	1.2
20	6 37	17 49	0 23	1 16	22 26	2.1	9 44	1.4
10	6 23	18 3	0 22	1 13	22 19	1.9	9 48	1.6
0	6 9	18 16	0 22	1 13	22 13	1.7	9 52	1.7
10	5 55	18 30	0 22	1 15	22 7	1.6	9 56	1.9
20	5 41	18 44	0 24	1 20	22 1	1.4	9 60	2.1
30	5 24	19 1	0 26	1 30	21 54	1.2	10 4	2.3
35	5 14	19 11	0 28	1 38	21 50	1.1	10 7	2.4
40	5 2	19 23	0 30	1 49	21 45	.9	10 10	2.6
45	4 49	19 36	0 34	2 7	21 40	.8	10 14	2.7
50	4 32	19 53	0 39	2 39	21 33	.6	10 18	3.0
55	4 10	20 14	0 47	: ::	21 25	.3	10 23	3.2
60	3 41	20 43	1 2	: ::	21 15	.0	10 30	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 34.1	-.5	16.3	$T_{\overline{m}}$ 3 42	1.7	55.7	15.2
12	-12 40.3	$T_{\overline{m}_\odot}$ 12 h 12.7 min		Starost 18.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 52	.1	86	-3.9	♃	10 15	.0	80	-1.7
♂	21 8	.2	277	-.7	♄	2 16	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 48.3	-18 24.9	126 38.3	211 46.5	-22 25.8	43 12.3	26 44.1
2	206 48.1	-18 23.6	156 43.2	241 44.8	-22 25.8	73 17.4	26 44.0
4	236 47.8	-18 22.3	186 48.1	271 43.1	-22 25.8	103 22.5	26 44.0
6	266 47.6	-18 21.0	216 53.0	301 41.3	-22 25.8	133 27.7	26 43.9
8	296 47.4	-18 19.7	246 58.0	331 39.6	-22 25.9	163 32.8	26 43.8
10	326 47.1	-18 18.4	277 2.9	1 37.9	-22 25.9	193 37.9	26 43.7
12	356 46.9	-18 17.1	307 7.8	31 36.2	-22 25.9	223 43.0	26 43.6
14	26 46.6	-18 15.8	337 12.8	61 34.4	-22 25.9	253 48.1	26 43.5
16	56 46.4	-18 14.5	7 17.7	91 32.7	-22 25.9	283 53.2	26 43.5
18	86 46.1	-18 13.2	37 22.6	121 31.0	-22 25.9	313 58.3	26 43.4
20	116 45.9	-18 11.9	67 27.5	151 29.2	-22 25.9	344 3.3	26 43.3
22	146 45.7	-18 10.6	97 32.5	181 27.5	-22 25.9	14 8.4	26 43.2
Δ	-1	7		-9	0	25	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	296 3.8	159	-8 36.6	-137	206 47.9	-23 .1	327 2.8	10 30.9
2	325 13.5	158	-9 4.0	-136	236 51.6	-23 .0	357 8.0	10 31.0
4	354 23.1	158	-9 31.3	-135	266 55.4	-22 60.0	27 13.3	10 31.1
6	23 32.8	158	-9 58.4	-134	296 59.2	-22 59.9	57 18.5	10 31.3
8	52 42.3	157	-10 25.2	-133	327 2.9	-22 59.8	87 23.7	10 31.4
10	81 51.8	157	-10 51.9	-132	357 6.7	-22 59.8	117 28.9	10 31.5
12	111 1.2	157	-11 18.4	-131	27 10.4	-22 59.7	147 34.2	10 31.7
14	140 10.5	156	-11 44.6	-130	57 14.2	-22 59.6	177 39.4	10 31.8
16	169 19.8	156	-12 10.6	-129	87 18.0	-22 59.6	207 44.6	10 31.9
18	198 28.9	155	-12 36.4	-128	117 21.7	-22 59.5	237 49.8	10 32.1
20	227 37.9	155	-13 2.0	-127	147 25.5	-22 59.4	267 55.1	10 32.2
22	256 46.8	154	-13 27.4	-126	177 29.2	-22 59.4	298 .3	10 32.4
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 24	16 2	0 49	2 29	. . . .	.0	9 14	.0
55	7 59	16 27	0 41	2 8	. . . .	.0	9 28	.4
50	7 40	16 46	0 35	1 53	. . . .	.0	9 39	.6
45	7 25	17 1	0 32	1 42	23 54	2.7	9 48	.8
40	7 13	17 13	0 29	1 34	23 44	2.6	9 55	1.0
35	7 2	17 24	0 27	1 27	23 36	2.4	10 1	1.1
30	6 53	17 33	0 25	1 23	23 28	2.3	10 7	1.2
20	6 37	17 49	0 23	1 16	23 16	2.1	10 16	1.4
10	6 23	18 3	0 22	1 13	23 5	2.0	10 25	1.6
0	6 9	18 16	0 22	1 12	22 55	1.8	10 33	1.8
10	5 56	18 30	0 22	1 15	22 45	1.6	10 41	1.9
20	5 41	18 44	0 24	1 20	22 34	1.5	10 50	2.1
30	5 25	19 1	0 26	1 30	22 22	1.3	10 60	2.3
35	5 15	19 11	0 28	1 38	22 15	1.2	11 5	2.4
40	5 3	19 22	0 30	1 49	22 7	1.0	11 12	2.6
45	4 50	19 35	0 34	2 6	21 58	.9	11 20	2.7
50	4 34	19 51	0 39	2 37	21 47	.7	11 29	2.9
55	4 13	20 12	0 47	: ::	21 33	.4	11 41	3.2
60	3 44	20 40	1 1	: ::	21 15	.0	11 56	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 46.5	-.5	16.3	$T_{\overline{m}}$ 4 23	1.8	55.1	15.0
12	-12 52.3	$T_{\overline{m}_\odot}$ 12 h 12.9 min		Starost 19.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	9 53	.1	85	-3.9	♃	10 12	.0	80	-1.7
♂	21 4	.2	277	-.7	♄	2 11	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 45.4	−18 9.2	127 37.4	211 25.8	−22 25.9	44 13.5	26 43.1
2	206 45.2	−18 7.9	157 42.3	241 24.0	−22 25.9	74 18.5	26 43.1
4	236 45.0	−18 6.6	187 47.3	271 22.3	−22 25.8	104 23.6	26 43.0
6	266 44.7	−18 5.3	217 52.2	301 20.6	−22 25.8	134 28.6	26 42.9
8	296 44.5	−18 3.9	247 57.1	331 18.9	−22 25.8	164 33.7	26 42.8
10	326 44.3	−18 2.6	278 2.0	1 17.1	−22 25.7	194 38.7	26 42.7
12	356 44.1	−18 1.3	308 7.0	31 15.4	−22 25.7	224 43.7	26 42.6
14	26 43.8	−17 59.9	338 11.9	61 13.7	−22 25.6	254 48.8	26 42.6
16	56 43.6	−17 58.6	8 16.8	91 11.9	−22 25.6	284 53.8	26 42.5
18	86 43.4	−17 57.2	38 21.8	121 10.2	−22 25.5	314 58.8	26 42.4
20	116 43.2	−17 55.9	68 26.7	151 8.5	−22 25.5	345 3.8	26 42.3
22	146 43.0	−17 54.6	98 31.6	181 6.7	−22 25.4	15 8.8	26 42.2
Δ	−1	7		−9	0	25	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	285 55.6	153	−13 52.5	−124	207 33.0	−22 59.3	328 5.5	10 32.5
2	315 4.2	153	−14 17.3	−123	237 36.8	−22 59.2	358 10.8	10 32.6
4	344 12.7	152	−14 41.9	−122	267 40.5	−22 59.2	28 16.0	10 32.8
6	13 21.1	151	−15 6.3	−120	297 44.3	−22 59.1	58 21.2	10 32.9
8	42 29.3	150	−15 30.4	−119	327 48.1	−22 59.0	88 26.5	10 33.0
10	71 37.3	149	−15 54.2	−118	357 51.8	−22 58.9	118 31.7	10 33.2
12	100 45.2	149	−16 17.7	−116	27 55.6	−22 58.9	148 36.9	10 33.3
14	129 52.9	148	−16 41.0	−115	57 59.3	−22 58.8	178 42.2	10 33.4
16	159 .5	147	−17 4.0	−114	88 3.1	−22 58.7	208 47.4	10 33.6
18	188 7.8	146	−17 26.7	−112	118 6.9	−22 58.7	238 52.6	10 33.7
20	217 15.0	145	−17 49.1	−111	148 10.6	−22 58.6	268 57.9	10 33.9
22	246 21.9	144	−18 11.2	−109	178 14.4	−22 58.5	299 3.1	10 34.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 22	16 5	0 48	2 29	0 41	3.7	9 14	.1
55	7 57	16 30	0 41	2 7	0 21	3.2	9 37	.5
50	7 39	16 48	0 35	1 52	0 6	3.0	9 53	.7
45	7 24	17 3	0 32	1 42	. . . .	.0	10 7	.9
40	7 12	17 15	0 29	1 33	. . . .	.0	10 18	1.1
35	7 1	17 25	0 27	1 27	. . . .	.0	10 28	1.2
30	6 52	17 34	0 25	1 22	. . . .	.0	10 36	1.3
20	6 37	17 50	0 23	1 16	. . . .	.0	10 50	1.5
10	6 23	18 4	0 22	1 13	23 52	2.0	11 3	1.7
0	6 10	18 17	0 22	1 12	23 38	1.9	11 15	1.8
10	5 56	18 30	0 22	1 14	23 24	1.7	11 27	2.0
20	5 42	18 44	0 23	1 20	23 9	1.6	11 40	2.1
30	5 25	19 0	0 26	1 30	22 52	1.4	11 55	2.3
35	5 16	19 10	0 28	1 37	22 43	1.3	12 4	2.5
40	5 5	19 21	0 30	1 48	22 32	1.2	12 14	2.6
45	4 51	19 34	0 34	2 5	22 19	1.0	12 25	2.7
50	4 35	19 50	0 39	2 35	22 3	.8	12 40	3.0
55	4 15	20 10	0 46	: : :	21 43	.6	12 58	3.2
60	3 46	20 38	1 0	: : :	21 16	.1	13 22	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−12 58.1	−.5	16.3	$T_{\overline{m}}$	5 5	1.8	54.6	14.9
12	−13 3.5	$T_{\overline{m}_\odot}$	12 h 13.1 min	Starost 20.5 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 55	.1	84	−3.9	♃	10 9	.0	80	−1.7
♂	20 60	.2	277	−.7	♄	2 7	.0	200	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 42.7	−17 53.2	128 36.5	211 5.0	−22 25.3	45 13.8	26 42.2
2	206 42.5	−17 51.9	158 41.5	241 3.3	−22 25.2	75 18.8	26 42.1
4	236 42.3	−17 50.5	188 46.4	271 1.5	−22 25.2	105 23.8	26 42.0
6	266 42.1	−17 49.1	218 51.3	300 59.8	−22 25.1	135 28.7	26 41.9
8	296 41.9	−17 47.8	248 56.3	330 58.1	−22 25.0	165 33.7	26 41.8
10	326 41.7	−17 46.4	279 1.2	0 56.3	−22 24.9	195 38.7	26 41.8
12	356 41.5	−17 45.1	309 6.1	30 54.6	−22 24.8	225 43.6	26 41.7
14	26 41.2	−17 43.7	339 11.0	60 52.9	−22 24.7	255 48.6	26 41.6
16	56 41.0	−17 42.3	9 16.0	90 51.1	−22 24.6	285 53.5	26 41.5
18	86 40.8	−17 41.0	39 20.9	120 49.4	−22 24.5	315 58.5	26 41.4
20	116 40.6	−17 39.6	69 25.8	150 47.7	−22 24.4	346 3.4	26 41.4
22	146 40.4	−17 38.2	99 30.8	180 45.9	−22 24.2	16 8.3	26 41.3
Δ	−1	7		−9	1	25	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	275 28.7	143	−18 33.0	−107	208 18.2	−22 58.5	329 8.3	10 34.1
2	304 35.2	142	−18 54.5	−106	238 21.9	−22 58.4	359 13.6	10 34.3
4	333 41.6	141	−19 15.6	−104	268 25.7	−22 58.3	29 18.8	10 34.4
6	2 47.7	139	−19 36.5	−103	298 29.5	−22 58.3	59 24.0	10 34.5
8	31 53.6	138	−19 57.0	−101	328 33.2	−22 58.2	89 29.3	10 34.7
10	60 59.2	137	−20 17.2	−99	358 37.0	−22 58.1	119 34.5	10 34.8
12	90 4.7	136	−20 37.0	−97	28 40.8	−22 58.0	149 39.7	10 35.0
14	119 9.9	135	−20 56.5	−96	58 44.6	−22 58.0	179 45.0	10 35.1
16	148 14.8	134	−21 15.6	−94	88 48.3	−22 57.9	209 50.2	10 35.2
18	177 19.6	132	−21 34.4	−92	118 52.1	−22 57.8	239 55.5	10 35.4
20	206 24.0	131	−21 52.8	−90	148 55.9	−22 57.8	270 .7	10 35.5
22	235 28.3	130	−22 10.9	−88	178 59.6	−22 57.7	300 5.9	10 35.6
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 20	16 7	0 48	2 28	2 9	3.8	9 16	.2
55	7 56	16 32	0 40	2 7	1 39	3.3	9 48	.7
50	7 37	16 50	0 35	1 52	1 17	3.0	10 11	.9
45	7 23	17 4	0 32	1 41	0 60	2.7	10 29	1.1
40	7 11	17 16	0 29	1 33	0 46	2.6	10 44	1.3
35	7 1	17 26	0 27	1 27	0 34	2.5	10 57	1.4
30	6 52	17 35	0 25	1 22	0 24	2.4	11 8	1.5
20	6 36	17 50	0 23	1 16	0 7	2.2	11 27	1.7
10	6 23	18 4	0 22	1 13	. . . .	.0	11 44	1.8
0	6 10	18 17	0 22	1 12	. . . .	.0	11 59	1.9
10	5 57	18 30	0 22	1 14	. . . .	.0	12 15	2.1
20	5 43	18 44	0 23	1 19	23 47	1.8	12 32	2.2
30	5 26	18 60	0 26	1 29	23 26	1.6	12 51	2.4
35	5 17	19 9	0 28	1 37	23 14	1.5	13 3	2.5
40	5 6	19 20	0 30	1 48	22 60	1.4	13 16	2.6
45	4 53	19 33	0 34	2 4	22 43	1.3	13 31	2.7
50	4 37	19 48	0 38	2 33	22 23	1.1	13 51	2.9
55	4 17	20 8	0 46	: : :	21 56	.8	14 16	3.2
60	3 49	20 36	0 59	: : :	21 19	.3	14 51	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−13 8.9	−.4	16.3	$T_{\overline{m}}$	5 48	1.9	54.3	14.8
12	−13 13.9	$T_{\overline{m}_\odot}$	12 h 13.2 min	Starost 21.5 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 56	.1	82	−3.9	♃	10 6	.0	80	−1.7
♂	20 56	.2	277	−.7	♄	2 3	.0	201	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 40.2	-17 36.9	129 35.7	210 44.2	-22 24.1	46 13.3	26 41.2
2	206 40.0	-17 35.5	159 40.6	240 42.5	-22 24.0	76 18.2	26 41.1
4	236 39.8	-17 34.1	189 45.5	270 40.7	-22 23.8	106 23.1	26 41.0
6	266 39.6	-17 32.7	219 50.5	300 39.0	-22 23.7	136 28.0	26 41.0
8	296 39.4	-17 31.3	249 55.4	330 37.3	-22 23.6	166 32.9	26 40.9
10	326 39.2	-17 29.9	280 .3	0 35.5	-22 23.4	196 37.8	26 40.8
12	356 39.1	-17 28.6	310 5.2	30 33.8	-22 23.3	226 42.7	26 40.7
14	26 38.9	-17 27.2	340 10.2	60 32.1	-22 23.1	256 47.6	26 40.6
16	56 38.7	-17 25.8	10 15.1	90 30.3	-22 22.9	286 52.4	26 40.6
18	86 38.5	-17 24.4	40 20.0	120 28.6	-22 22.8	316 57.3	26 40.5
20	116 38.3	-17 23.0	70 25.0	150 26.9	-22 22.6	347 2.2	26 40.4
22	146 38.1	-17 21.6	100 29.9	180 25.2	-22 22.4	17 7.0	26 40.3
Δ	-1	7		-9	1	24	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	264 32.2	129	-22 28.5	-86	209 3.4	-22 57.6	330 11.2	10 35.8
2	293 35.9	127	-22 45.8	-84	239 7.2	-22 57.6	0 16.4	10 35.9
4	322 39.4	126	-23 2.7	-82	269 11.0	-22 57.5	30 21.7	10 36.1
6	351 42.6	125	-23 19.2	-80	299 14.7	-22 57.4	60 26.9	10 36.2
8	20 45.6	123	-23 35.2	-78	329 18.5	-22 57.3	90 32.1	10 36.3
10	49 48.2	122	-23 50.9	-76	359 22.3	-22 57.3	120 37.4	10 36.5
12	78 50.7	121	-24 6.2	-74	29 26.0	-22 57.2	150 42.6	10 36.6
14	107 52.8	120	-24 21.0	-72	59 29.8	-22 57.1	180 47.9	10 36.8
16	136 54.7	118	-24 35.4	-70	89 33.6	-22 57.1	210 53.1	10 36.9
18	165 56.4	117	-24 49.4	-68	119 37.4	-22 57.0	240 58.4	10 37.0
20	194 57.7	116	-25 2.9	-65	149 41.1	-22 56.9	271 3.6	10 37.2
22	223 58.9	114	-25 16.0	-63	179 44.9	-22 56.8	301 8.8	10 37.3
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 18	16 10	0 48	2 28	3 40	3.8	9 20	.4
55	7 54	16 34	0 40	2 7	2 57	3.2	10 3	1.0
50	7 36	16 51	0 35	1 52	2 28	2.9	10 33	1.3
45	7 22	17 5	0 31	1 41	2 6	2.7	10 56	1.4
40	7 10	17 17	0 29	1 33	1 48	2.6	11 15	1.5
35	7 0	17 27	0 27	1 27	1 33	2.5	11 30	1.6
30	6 51	17 36	0 25	1 22	1 21	2.4	11 44	1.7
20	6 36	17 51	0 23	1 16	0 59	2.2	12 7	1.8
10	6 23	18 4	0 22	1 13	0 40	2.1	12 27	2.0
0	6 10	18 17	0 22	1 12	0 23	2.0	12 46	2.0
10	5 57	18 30	0 22	1 14	0 6	1.9	13 5	2.1
20	5 43	18 43	0 23	1 19	.. ..	.0	13 25	2.2
30	5 27	18 59	0 26	1 29	.. ..	.0	13 48	2.4
35	5 18	19 9	0 28	1 37	23 50	1.8	14 2	2.4
40	5 7	19 19	0 30	1 47	23 34	1.7	14 18	2.5
45	4 54	19 32	0 33	2 3	23 14	1.6	14 37	2.6
50	4 39	19 47	0 38	2 31	22 49	1.5	15 1	2.8
55	4 19	20 7	0 45	: ::	22 16	1.2	15 33	3.1
60	3 52	20 33	0 58	: ::	21 25	.6	16 22	3.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 18.9	-.4	16.3	$T_{\overline{m}}$ 6 34	2.0	54.2	14.8
12	-13 23.5	$T_{\overline{m}_\odot}$ 12 h 13.4 min		Starost 22.5 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 58	.1	81	-3.9	♃	10 3	.0	79	-1.7
♂	20 52	.2	277	-.6	♄	1 59	.0	201	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 37.9	-17 20.2	130 34.8	210 23.4	-22 22.2	47 11.9	26 40.2
2	206 37.7	-17 18.8	160 39.7	240 21.7	-22 22.0	77 16.7	26 40.2
4	236 37.6	-17 17.4	190 44.7	270 20.0	-22 21.9	107 21.6	26 40.1
6	266 37.4	-17 16.0	220 49.6	300 18.2	-22 21.7	137 26.4	26 40.0
8	296 37.2	-17 14.6	250 54.5	330 16.5	-22 21.5	167 31.2	26 39.9
10	326 37.0	-17 13.2	280 59.5	0 14.8	-22 21.2	197 36.1	26 39.8
12	356 36.8	-17 11.7	311 4.4	30 13.0	-22 21.0	227 40.9	26 39.8
14	26 36.7	-17 10.3	341 9.3	60 11.3	-22 20.8	257 45.7	26 39.7
16	56 36.5	-17 8.9	11 14.2	90 9.6	-22 20.6	287 50.5	26 39.6
18	86 36.3	-17 7.5	41 19.2	120 7.8	-22 20.4	317 55.3	26 39.5
20	116 36.2	-17 6.1	71 24.1	150 6.1	-22 20.2	348 .1	26 39.5
22	146 36.0	-17 4.6	101 29.0	180 4.4	-22 19.9	18 4.9	26 39.4
Δ	-1	7		-9	1	24	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	252 59.7	113	-25 28.7	-61	209 48.7	-22 56.8	331 14.1	10 37.5
2	282 .3	112	-25 40.8	-59	239 52.5	-22 56.7	1 19.3	10 37.6
4	311 .7	111	-25 52.5	-56	269 56.3	-22 56.6	31 24.6	10 37.7
6	340 .8	109	-26 3.8	-54	300 .0	-22 56.6	61 29.8	10 37.9
8	9 .6	108	-26 14.6	-51	330 3.8	-22 56.5	91 35.1	10 38.0
10	38 .2	107	-26 24.8	-49	0 7.6	-22 56.4	121 40.3	10 38.2
12	66 59.6	106	-26 34.6	-47	30 11.4	-22 56.3	151 45.6	10 38.3
14	95 58.7	105	-26 43.9	-44	60 15.2	-22 56.3	181 50.8	10 38.4
16	124 57.6	103	-26 52.7	-41	90 18.9	-22 56.2	211 56.1	10 38.6
18	153 56.3	102	-27 1.0	-39	120 22.7	-22 56.1	242 1.3	10 38.7
20	182 54.8	101	-27 8.8	-36	150 26.5	-22 56.0	272 6.6	10 38.9
22	211 53.0	100	-27 16.1	-34	180 30.3	-22 56.0	302 11.8	10 39.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 15	16 13	0 48	2 27	5 10	3.5	9 29	.9
55	7 52	16 36	0 40	2 6	4 13	2.9	10 27	1.5
50	7 35	16 53	0 35	1 52	3 37	2.7	11 4	1.7
45	7 21	17 7	0 31	1 41	3 11	2.6	11 31	1.8
40	7 9	17 18	0 29	1 33	2 50	2.5	11 52	1.9
35	6 59	17 28	0 27	1 27	2 32	2.4	12 10	1.9
30	6 51	17 37	0 25	1 22	2 18	2.3	12 25	2.0
20	6 36	17 52	0 23	1 16	1 52	2.3	12 51	2.0
10	6 23	18 5	0 22	1 13	1 31	2.2	13 14	2.1
0	6 10	18 17	0 22	1 12	1 11	2.1	13 35	2.1
10	5 57	18 30	0 22	1 14	0 51	2.0	13 56	2.2
20	5 44	18 43	0 23	1 19	0 29	1.9	14 19	2.2
30	5 28	18 59	0 26	1 29	0 5	1.8	14 45	2.3
35	5 19	19 8	0 28	1 36	.. ..	.0	15 0	2.3
40	5 8	19 18	0 30	1 47	.. ..	.0	15 19	2.4
45	4 56	19 30	0 33	2 3	23 52	2.0	15 40	2.4
50	4 41	19 46	0 38	2 29	23 24	2.0	16 8	2.5
55	4 21	20 5	0 45	: ::	22 45	1.8	16 47	2.6
60	3 55	20 31	0 58	: ::	21 41	1.5	17 50	3.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 28.1	-.4	16.3	$T_{\overline{m}}$ 7 23	2.1	54.3	14.8
12	-13 32.3	$T_{\overline{m}_\odot}$ 12 h 13.5 min		Starost 23.5 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	9 59	.1	80	-3.9	♃	9 59	.0	79	-1.7
♂	20 48	.2	277	-.6	♄	1 55	.0	201	.5

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 35.8	-17 3.2	131 34.0	210 2.7	-22 19.7	48 9.7	26 39.3
2	206 35.6	-17 1.8	161 38.9	240 .9	-22 19.4	78 14.4	26 39.2
4	236 35.5	-17 .4	191 43.8	269 59.2	-22 19.2	108 19.2	26 39.1
6	266 35.3	-16 58.9	221 48.7	299 57.5	-22 18.9	138 24.0	26 39.1
8	296 35.2	-16 57.5	251 53.7	329 55.7	-22 18.7	168 28.7	26 39.0
10	326 35.0	-16 56.1	281 58.6	359 54.0	-22 18.4	198 33.5	26 38.9
12	356 34.8	-16 54.6	312 3.5	29 52.3	-22 18.2	228 38.2	26 38.8
14	26 34.7	-16 53.2	342 8.5	59 50.6	-22 17.9	258 43.0	26 38.8
16	56 34.5	-16 51.7	12 13.4	89 48.8	-22 17.6	288 47.7	26 38.7
18	86 34.4	-16 50.3	42 18.3	119 47.1	-22 17.3	318 52.4	26 38.6
20	116 34.2	-16 48.8	72 23.2	149 45.4	-22 17.0	348 57.2	26 38.5
22	146 34.1	-16 47.4	102 28.2	179 43.6	-22 16.8	19 1.9	26 38.4
Δ	-1	7		-9	1	24	0

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	240 51.0	99	-27 22.8	-31	210 34.1	-22 55.9	332 17.1	10 39.2
2	269 48.9	98	-27 29.0	-28	240 37.8	-22 55.8	2 22.3	10 39.3
4	298 46.5	97	-27 34.7	-26	270 41.6	-22 55.8	32 27.6	10 39.4
6	327 43.9	96	-27 39.9	-23	300 45.4	-22 55.7	62 32.8	10 39.6
8	356 41.2	95	-27 44.5	-20	330 49.2	-22 55.6	92 38.1	10 39.7
10	25 38.3	95	-27 48.5	-18	0 53.0	-22 55.5	122 43.3	10 39.9
12	54 35.2	94	-27 52.0	-15	30 56.8	-22 55.5	152 48.6	10 40.0
14	83 32.0	93	-27 55.0	-12	61 .5	-22 55.4	182 53.8	10 40.2
16	112 28.6	92	-27 57.4	-9	91 4.3	-22 55.3	212 59.1	10 40.3
18	141 25.1	92	-27 59.2	-6	121 8.1	-22 55.2	243 4.3	10 40.4
20	170 21.4	91	-28 .5	-4	151 11.9	-22 55.2	273 9.6	10 40.6
22	199 17.6	91	-28 1.2	-1	181 15.7	-22 55.1	303 14.8	10 40.7
Δ					19	0	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 13	16 15	0 47	2 27	6 34	2.4	9 51	2.1
55	7 50	16 38	0 40	2 6	5 23	2.4	11 3	2.2
50	7 33	16 55	0 35	1 51	4 41	2.3	11 44	2.2
45	7 20	17 8	0 31	1 41	4 12	2.3	12 14	2.2
40	7 8	17 20	0 29	1 33	3 49	2.3	12 37	2.2
35	6 59	17 29	0 27	1 27	3 30	2.3	12 56	2.2
30	6 50	17 38	0 25	1 22	3 14	2.3	13 12	2.2
20	6 35	17 52	0 23	1 16	2 47	2.2	13 40	2.2
10	6 22	18 5	0 22	1 12	2 23	2.2	14 4	2.2
0	6 10	18 17	0 22	1 12	2 1	2.2	14 26	2.2
10	5 58	18 29	0 22	1 14	1 39	2.2	14 49	2.2
20	5 44	18 43	0 23	1 19	1 16	2.1	15 12	2.2
30	5 29	18 58	0 26	1 28	0 49	2.1	15 40	2.2
35	5 20	19 7	0 27	1 36	0 33	2.1	15 57	2.2
40	5 9	19 17	0 30	1 46	0 15	2.1	16 16	2.1
45	4 57	19 29	0 33	2 2	. . .	.0	16 39	2.1
50	4 42	19 44	0 38	2 28	. . .	.0	17 9	2.1
55	4 23	20 3	0 45	3 44	23 29	2.6	17 50	2.0
60	3 57	20 28	0 57	: ::	22 17	2.8	19 3	1.8
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 36.6	-.3	16.3	$T_{\overline{m}}$	8 14	2.2	54.5	14.8
12	-13 40.4	$T_{\overline{m}_\odot}$	12 h 13.7 min	Starost 24.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 0	.1	78	-3.9	♃	9 56	.0	79	-1.7
♂	20 44	.2	277	-.6	♄	1 51	.0	201	.5

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	δ_φ	MARS S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 33.9	-16 45.9	132 33.1	209 41.9	-22 16.5	49 6.6	26 38.4
2	206 33.8	-16 44.5	162 38.0	239 40.2	-22 16.2	79 11.3	26 38.3
4	236 33.6	-16 43.0	192 43.0	269 38.5	-22 15.9	109 16.0	26 38.2
6	266 33.5	-16 41.6	222 47.9	299 36.7	-22 15.6	139 20.7	26 38.1
8	296 33.3	-16 40.1	252 52.8	329 35.0	-22 15.2	169 25.4	26 38.1
10	326 33.2	-16 38.7	282 57.7	359 33.3	-22 14.9	199 30.1	26 38.0
12	356 33.0	-16 37.2	313 2.7	29 31.6	-22 14.6	229 34.8	26 37.9
14	26 32.9	-16 35.7	343 7.6	59 29.8	-22 14.3	259 39.5	26 37.8
16	56 32.8	-16 34.3	13 12.5	89 28.1	-22 13.9	289 44.1	26 37.8
18	86 32.6	-16 32.8	43 17.5	119 26.4	-22 13.6	319 48.8	26 37.7
20	116 32.5	-16 31.3	73 22.4	149 24.7	-22 13.3	349 53.4	26 37.6
22	146 32.3	-16 29.8	103 27.3	179 22.9	-22 12.9	19 58.1	26 37.5
Δ	-1	7		-9	2	23	0

UT	MESEC $S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	JUPITER $S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 13.8	90	-28 1.4	2	211 19.5	-22 55.0	333 20.1	10 40.9
2	257 9.8	90	-28 .9	5	241 23.3	-22 54.9	3 25.4	10 41.0
4	286 5.7	89	-27 59.9	8	271 27.0	-22 54.9	33 30.6	10 41.2
6	315 1.6	89	-27 58.4	11	301 30.8	-22 54.8	63 35.9	10 41.3
8	343 57.4	89	-27 56.2	14	331 34.6	-22 54.7	93 41.1	10 41.4
10	12 53.1	88	-27 53.5	17	1 38.4	-22 54.6	123 46.4	10 41.6
12	41 48.8	88	-27 50.1	20	31 42.2	-22 54.6	153 51.6	10 41.7
14	70 44.4	88	-27 46.2	22	61 46.0	-22 54.5	183 56.9	10 41.9
16	99 40.0	88	-27 41.7	25	91 49.8	-22 54.4	214 2.2	10 42.0
18	128 35.6	88	-27 36.7	28	121 53.6	-22 54.3	244 7.4	10 42.2
20	157 31.2	88	-27 31.0	31	151 57.4	-22 54.3	274 12.7	10 42.3
22	186 26.8	88	-27 24.8	34	182 1.2	-22 54.2	304 17.9	10 42.5
Δ					19	0	26	1

φ	SUNCE IZLAZ	ZALAZ	TRAJANJE SUMRAKA GRAĐ.	ASTR.	MESEC IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 11	16 18	0 47	2 26	7 33	1.2	10 42	3.5
55	7 48	16 40	0 40	2 6	6 19	1.7	11 56	2.9
50	7 32	16 57	0 35	1 51	5 37	1.9	12 37	2.7
45	7 18	17 10	0 31	1 41	5 7	1.9	13 7	2.6
40	7 7	17 21	0 29	1 33	4 44	2.0	13 30	2.5
35	6 58	17 30	0 27	1 27	4 24	2.1	13 50	2.5
30	6 50	17 38	0 25	1 22	4 8	2.1	14 6	2.4
20	6 35	17 53	0 23	1 15	3 40	2.1	14 34	2.4
10	6 22	18 5	0 22	1 12	3 16	2.2	14 57	2.3
0	6 10	18 17	0 22	1 12	2 54	2.2	15 19	2.2
10	5 58	18 29	0 22	1 14	2 31	2.3	15 41	2.2
20	5 45	18 42	0 23	1 19	2 7	2.3	16 5	2.1
30	5 30	18 57	0 26	1 28	1 40	2.3	16 32	2.0
35	5 21	19 6	0 27	1 35	1 23	2.4	16 49	1.9
40	5 11	19 16	0 30	1 46	1 4	2.4	17 7	1.9
45	4 59	19 28	0 33	2 1	0 41	2.4	17 30	1.8
50	4 44	19 42	0 38	2 26	0 11	2.5	17 59	1.6
55	4 25	20 1	0 44	3 32	. . .	.0	18 39	1.4
60	4 0	20 26	0 56	: ::	23 25	3.8	19 45	.8
S								

SUNCE UT	e = T_p − UT	Δ/24	r	MESEC Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 44.2	-.3	16.3	$T_{\overline{m}}$	9 7	2.2	54.8	14.9
12	-13 47.6	$T_{\overline{m}_\odot}$	12 h 13.8 min	Starost 25.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 2	.1	77	-3.9	♃	9 53	.0	79	-1.7
♂	20 40	.2	277	-.5	♄	1 46	.0	201	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 32.2	-16 28.4	133 32.2	209 21.2	-22 12.6	50 2.7	26 37.5
2	206 32.1	-16 26.9	163 37.2	239 19.5	-22 12.2	80 7.4	26 37.4
4	236 31.9	-16 25.4	193 42.1	269 17.8	-22 11.9	110 12.0	26 37.3
6	266 31.8	-16 23.9	223 47.0	299 16.1	-22 11.5	140 16.7	26 37.2
8	296 31.7	-16 22.4	253 51.9	329 14.3	-22 11.1	170 21.3	26 37.2
10	326 31.6	-16 21.0	283 56.9	359 12.6	-22 10.8	200 25.9	26 37.1
12	356 31.4	-16 19.5	314 1.8	29 10.9	-22 10.4	230 30.5	26 37.0
14	26 31.3	-16 18.0	344 6.7	59 9.2	-22 10.0	260 35.1	26 36.9
16	56 31.2	-16 16.5	14 11.7	89 7.5	-22 9.6	290 39.7	26 36.9
18	86 31.1	-16 15.0	44 16.6	119 5.7	-22 9.2	320 44.3	26 36.8
20	116 30.9	-16 13.5	74 21.5	149 4.0	-22 8.8	350 48.9	26 36.7
22	146 30.8	-16 12.0	104 26.4	179 2.3	-22 8.4	20 53.5	26 36.6
Δ	-1	7		-9	2	23	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	215 22.5	88	-27 17.9	37	212 4.9	-22 54.1	334 23.2	10 42.6
2	244 18.1	88	-27 10.5	40	242 8.7	-22 54.0	4 28.5	10 42.7
4	273 13.8	89	-27 2.6	43	272 12.5	-22 54.0	34 33.7	10 42.9
6	302 9.5	89	-26 54.0	46	302 16.3	-22 53.9	64 39.0	10 43.0
8	331 5.3	89	-26 44.8	49	332 20.1	-22 53.8	94 44.2	10 43.2
10	0 1.1	90	-26 35.1	51	2 23.9	-22 53.7	124 49.5	10 43.3
12	28 57.0	90	-26 24.8	54	32 27.7	-22 53.7	154 54.8	10 43.5
14	57 53.0	90	-26 14.0	57	62 31.5	-22 53.6	185 .0	10 43.6
16	86 49.1	91	-26 2.5	60	92 35.3	-22 53.5	215 5.3	10 43.8
18	115 45.3	91	-25 50.5	63	122 39.1	-22 53.4	245 10.5	10 43.9
20	144 41.6	92	-25 38.0	66	152 42.9	-22 53.4	275 15.8	10 44.1
22	173 38.0	93	-25 24.8	68	182 46.7	-22 53.3	305 21.1	10 44.2
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 8	16 20	0 47	2 26	8 1	.5	12 5	4.1
55	7 47	16 42	0 40	2 5	6 60	1.1	13 6	3.4
50	7 30	16 58	0 35	1 51	6 22	1.4	13 43	3.1
45	7 17	17 11	0 31	1 40	5 54	1.6	14 10	2.9
40	7 6	17 22	0 28	1 32	5 32	1.7	14 31	2.8
35	6 57	17 31	0 26	1 26	5 14	1.8	14 49	2.7
30	6 49	17 39	0 25	1 22	4 58	1.9	15 4	2.6
20	6 35	17 53	0 23	1 15	4 31	2.0	15 30	2.4
10	6 22	18 6	0 22	1 12	4 9	2.1	15 52	2.3
0	6 10	18 17	0 22	1 12	3 47	2.2	16 13	2.2
10	5 58	18 29	0 22	1 14	3 26	2.3	16 33	2.1
20	5 46	18 42	0 23	1 19	3 3	2.4	16 55	1.9
30	5 31	18 57	0 26	1 28	2 36	2.5	17 20	1.8
35	5 22	19 5	0 27	1 35	2 20	2.6	17 35	1.7
40	5 12	19 15	0 30	1 45	2 1	2.7	17 52	1.6
45	5 0	19 27	0 33	2 0	1 39	2.8	18 12	1.4
50	4 46	19 41	0 37	2 25	1 11	2.9	18 38	1.2
55	4 28	19 59	0 44	3 24	0 31	3.2	19 12	.9
60	4 3	20 23	0 55	: ::	.. ..	.0	20 4	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 51.0	-.3	16.3	$T_{\overline{m}}$ 9 60	2.2	55.3	15.1
12	-13 54.0	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 26.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 3	.1	76	-3.9	♃	9 50	.0	79	-1.7
♂	20 37	.2	277	-.5	♄	1 42	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 30.7	-16 10.5	134 31.4	209 .6	-22 8.0	50 58.1	26 36.6
2	206 30.6	-16 9.0	164 36.3	238 58.9	-22 7.6	81 2.7	26 36.5
4	236 30.5	-16 7.5	194 41.2	268 57.2	-22 7.2	111 7.2	26 36.4
6	266 30.4	-16 6.0	224 46.2	298 55.4	-22 6.8	141 11.8	26 36.3
8	296 30.2	-16 4.5	254 51.1	328 53.7	-22 6.4	171 16.3	26 36.3
10	326 30.1	-16 3.0	284 56.0	358 52.0	-22 5.9	201 20.9	26 36.2
12	356 30.0	-16 1.5	315 .9	28 50.3	-22 5.5	231 25.4	26 36.1
14	26 29.9	-16 .0	345 5.9	58 48.6	-22 5.1	261 30.0	26 36.0
16	56 29.8	-15 58.5	15 10.8	88 46.9	-22 4.6	291 34.5	26 36.0
18	86 29.7	-15 56.9	45 15.7	118 45.2	-22 4.2	321 39.1	26 35.9
20	116 29.6	-15 55.4	75 20.7	148 43.5	-22 3.7	351 43.6	26 35.8
22	146 29.5	-15 53.9	105 25.6	178 41.7	-22 3.3	21 48.1	26 35.7
Δ	-1	8		-9	2	23	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	202 34.5	93	-25 11.2	71	212 50.5	-22 53.2	335 26.3	10 44.3
2	231 31.2	94	-24 56.9	74	242 54.3	-22 53.1	5 31.6	10 44.5
4	260 28.0	95	-24 42.2	77	272 58.1	-22 53.0	35 36.9	10 44.6
6	289 24.9	95	-24 26.9	79	303 1.9	-22 53.0	65 42.1	10 44.8
8	318 22.0	96	-24 11.0	82	333 5.7	-22 52.9	95 47.4	10 44.9
10	347 19.3	97	-23 54.6	84	3 9.5	-22 52.8	125 52.7	10 45.1
12	16 16.7	98	-23 37.7	87	33 13.3	-22 52.7	155 57.9	10 45.2
14	45 14.3	99	-23 20.3	90	63 17.1	-22 52.7	186 3.2	10 45.4
16	74 12.0	100	-23 2.4	92	93 20.9	-22 52.6	216 8.5	10 45.5
18	103 10.0	100	-22 43.9	95	123 24.7	-22 52.5	246 13.7	10 45.7
20	132 8.0	101	-22 25.0	97	153 28.5	-22 52.4	276 19.0	10 45.8
22	161 6.3	102	-22 5.6	100	183 32.3	-22 52.3	306 24.3	10 46.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 6	16 23	0 46	2 25	8 13	.2	13 43	4.2
55	7 45	16 44	0 39	2 5	7 27	.8	14 27	3.6
50	7 29	17 0	0 34	1 51	6 56	1.1	14 57	3.3
45	7 16	17 13	0 31	1 40	6 32	1.3	15 20	3.1
40	7 5	17 23	0 28	1 32	6 13	1.4	15 38	2.9
35	6 56	17 32	0 26	1 26	5 57	1.6	15 53	2.7
30	6 48	17 40	0 25	1 22	5 43	1.7	16 6	2.6
20	6 34	17 54	0 23	1 15	5 20	1.9	16 28	2.4
10	6 22	18 6	0 22	1 12	4 59	2.0	16 47	2.3
0	6 11	18 17	0 21	1 12	4 40	2.1	17 5	2.1
10	5 59	18 29	0 22	1 13	4 21	2.3	17 23	1.9
20	5 46	18 42	0 23	1 18	4 0	2.4	17 41	1.8
30	5 32	18 56	0 25	1 28	3 36	2.6	18 3	1.6
35	5 23	19 4	0 27	1 35	3 22	2.7	18 15	1.5
40	5 13	19 14	0 30	1 45	3 6	2.8	18 30	1.3
45	5 2	19 26	0 33	1 59	2 46	3.0	18 47	1.2
50	4 48	19 39	0 37	2 23	2 21	3.2	19 7	.9
55	4 30	19 57	0 44	3 18	1 48	3.5	19 34	.6
60	4 6	20 21	0 55	: ::	0 57	4.1	20 12	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 57.0	-.2	16.3	$T_{\overline{m}}$ 10 53	2.1	55.9	15.2
12	-13 59.6	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 27.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 5	.1	74	-3.9	♃	9 47	.0	78	-1.7
♂	20 33	.2	276	-.5	♄	1 38	.0	201	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.4	-15 52.4	135 30.5	208 40.0	-22 2.8	51 52.6	26 35.7
2	206 29.3	-15 50.9	165 35.4	238 38.3	-22 2.4	81 57.1	26 35.6
4	236 29.2	-15 49.3	195 40.4	268 36.6	-22 1.9	112 1.6	26 35.5
6	266 29.1	-15 47.8	225 45.3	298 34.9	-22 1.4	142 6.1	26 35.5
8	296 29.0	-15 46.3	255 50.2	328 33.2	-22 .9	172 10.6	26 35.4
10	326 28.9	-15 44.7	285 55.2	358 31.5	-22 .5	202 15.1	26 35.3
12	356 28.8	-15 43.2	316 .1	28 29.8	-21 60.0	232 19.6	26 35.2
14	26 28.7	-15 41.7	346 5.0	58 28.1	-21 59.5	262 24.1	26 35.2
16	56 28.6	-15 40.1	16 9.9	88 26.4	-21 59.0	292 28.5	26 35.1
18	86 28.6	-15 38.6	46 14.9	118 24.7	-21 58.5	322 33.0	26 35.0
20	116 28.5	-15 37.1	76 19.8	148 23.0	-21 58.0	352 37.5	26 35.0
22	146 28.4	-15 35.5	106 24.7	178 21.3	-21 57.5	22 41.9	26 34.9
Δ	0	8		-9	2	22	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	190 4.8	103	-21 45.6	102	213 36.1	-22 52.3	336 29.5	10 46.1
2	219 3.4	104	-21 25.2	104	243 39.9	-22 52.2	6 34.8	10 46.3
4	248 2.3	105	-21 4.4	107	273 43.7	-22 52.1	36 40.1	10 46.4
6	277 1.3	106	-20 43.0	109	303 47.5	-22 52.0	66 45.3	10 46.6
8	306 .5	107	-20 21.2	111	333 51.3	-22 52.0	96 50.6	10 46.7
10	334 59.9	108	-19 59.0	113	3 55.1	-22 51.9	126 55.9	10 46.8
12	3 59.5	109	-19 36.3	116	33 58.9	-22 51.8	157 1.1	10 47.0
14	32 59.3	110	-19 13.2	118	64 2.7	-22 51.7	187 6.4	10 47.1
16	61 59.3	111	-18 49.6	120	94 6.6	-22 51.6	217 11.7	10 47.3
18	90 59.5	112	-18 25.7	122	124 10.4	-22 51.6	247 17.0	10 47.4
20	119 59.8	113	-18 1.3	124	154 14.2	-22 51.5	277 22.2	10 47.6
22	149 .4	114	-17 36.5	126	184 18.0	-22 51.4	307 27.5	10 47.7
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 3	16 26	0 46	2 25	8 17	.1	15 23	4.1
55	7 43	16 46	0 39	2 5	7 45	.5	15 54	3.7
50	7 27	17 2	0 34	1 51	7 21	.8	16 16	3.3
45	7 15	17 14	0 31	1 40	7 3	1.1	16 33	3.1
40	7 4	17 24	0 28	1 32	6 48	1.2	16 47	2.9
35	6 55	17 33	0 26	1 26	6 35	1.4	16 59	2.8
30	6 48	17 41	0 25	1 21	6 24	1.5	17 9	2.6
20	6 34	17 54	0 23	1 15	6 4	1.7	17 26	2.4
10	6 22	18 6	0 22	1 12	5 47	1.9	17 41	2.2
0	6 11	18 18	0 21	1 11	5 31	2.1	17 55	2.0
10	5 59	18 29	0 22	1 13	5 16	2.2	18 9	1.8
20	5 47	18 41	0 23	1 18	4 58	2.4	18 24	1.6
30	5 32	18 55	0 25	1 27	4 39	2.6	18 41	1.4
35	5 24	19 4	0 27	1 34	4 27	2.8	18 50	1.3
40	5 14	19 13	0 29	1 44	4 14	2.9	19 1	1.1
45	5 3	19 24	0 33	1 58	3 58	3.1	19 14	1.0
50	4 49	19 38	0 37	2 21	3 38	3.3	19 30	.7
55	4 32	19 55	0 43	3 12	3 13	3.6	19 49	.5
60	4 8	20 18	0 54	: ::	2 37	4.2	20 16	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-14 2.2	-.2	16.2	$T_{\overline{m}}$ 11 43	2.0	56.5	15.4
12	-14 4.4	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 28.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 6	.1	73	-3.9	♃	9 44	.0	78	-1.7
♂	20 29	.2	276	-.4	♄	1 34	.0	201	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.3	-15 34.0	136 29.7	208 19.6	-21 57.0	52 46.4	26 34.8
2	206 28.2	-15 32.4	166 34.6	238 17.9	-21 56.4	82 50.8	26 34.7
4	236 28.1	-15 30.9	196 39.5	268 16.2	-21 55.9	112 55.3	26 34.7
6	266 28.1	-15 29.3	226 44.4	298 14.5	-21 55.4	142 59.7	26 34.6
8	296 28.0	-15 27.8	256 49.4	328 12.8	-21 54.9	173 4.1	26 34.5
10	326 27.9	-15 26.2	286 54.3	358 11.1	-21 54.3	203 8.5	26 34.4
12	356 27.8	-15 24.7	316 59.2	28 9.4	-21 53.8	233 13.0	26 34.4
14	26 27.7	-15 23.1	347 4.1	58 7.7	-21 53.2	263 17.4	26 34.3
16	56 27.7	-15 21.5	17 9.1	88 6.0	-21 52.7	293 21.8	26 34.2
18	86 27.6	-15 20.0	47 14.0	118 4.3	-21 52.1	323 26.2	26 34.2
20	116 27.5	-15 18.4	77 18.9	148 2.6	-21 51.6	353 30.6	26 34.1
22	146 27.5	-15 16.9	107 23.9	178 .9	-21 51.0	23 35.0	26 34.0
Δ	0	8		-8	3	22	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	178 1.1	115	-17 11.4	128	214 21.8	-22 51.3	337 32.8	10 47.9
2	207 2.0	115	-16 45.8	130	244 25.6	-22 51.2	7 38.0	10 48.0
4	236 3.1	116	-16 19.9	131	274 29.4	-22 51.2	37 43.3	10 48.2
6	265 4.3	117	-15 53.7	133	304 33.2	-22 51.1	67 48.6	10 48.3
8	294 5.8	118	-15 27.0	135	334 37.0	-22 51.0	97 53.9	10 48.5
10	323 7.4	119	-15 .0	137	4 40.8	-22 50.9	127 59.1	10 48.6
12	352 9.1	120	-14 32.7	138	34 44.7	-22 50.8	158 4.4	10 48.8
14	21 11.1	120	-14 5.1	140	64 48.5	-22 50.8	188 9.7	10 48.9
16	50 13.1	121	-13 37.1	141	94 52.3	-22 50.7	218 15.0	10 49.1
18	79 15.4	122	-13 8.9	143	124 56.1	-22 50.6	248 20.2	10 49.2
20	108 17.7	123	-12 40.3	144	154 59.9	-22 50.5	278 25.5	10 49.4
22	137 20.3	123	-12 11.5	146	185 3.7	-22 50.4	308 30.8	10 49.5
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 1	16 28	0 46	2 24	8 19	.0	17 2	4.0
55	7 41	16 48	0 39	2 4	7 58	.4	17 22	3.6
50	7 25	17 3	0 34	1 50	7 41	.7	17 36	3.3
45	7 13	17 16	0 31	1 40	7 28	.9	17 47	3.1
40	7 3	17 26	0 28	1 32	7 17	1.1	17 57	2.9
35	6 55	17 34	0 26	1 26	7 8	1.2	18 5	2.7
30	6 47	17 42	0 25	1 21	6 60	1.4	18 12	2.6
20	6 34	17 55	0 23	1 15	6 45	1.6	18 24	2.4
10	6 22	18 7	0 22	1 12	6 33	1.8	18 34	2.2
0	6 11	18 18	0 21	1 11	6 21	2.0	18 44	2.0
10	5 59	18 29	0 22	1 13	6 9	2.2	18 53	1.8
20	5 47	18 41	0 23	1 18	5 56	2.4	19 4	1.6
30	5 33	18 55	0 25	1 27	5 42	2.6	19 15	1.3
35	5 25	19 3	0 27	1 34	5 33	2.8	19 22	1.2
40	5 16	19 12	0 29	1 44	5 24	2.9	19 29	1.0
45	5 5	19 23	0 32	1 58	5 12	3.1	19 38	.9
50	4 51	19 36	0 37	2 20	4 58	3.3	19 48	.6
55	4 34	19 53	0 43	3 7	4 40	3.6	20 0	.4
60	4 11	20 15	0 54	: ::	4 17	4.1	20 17	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-14 6.6	-.2	16.2	$T_{\overline{m}}$ 12 32	2.0	57.1	15.6
12	-14 8.4	$T_{\overline{m}_\odot}$ 12 h 14.1 min		Starost 29.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 7	.1	72	-3.9	♃	9 41	.0	78	-1.7
♂	20 26	.2	276	-.4	♄	1 30	.0	201	.4

8. FEBRUAR 2008. PETAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.4	-15 15.3	137 28.8	207 59.2	-21 50.4	53 39.4	26 34.0
2	206 27.3	-15 13.7	167 33.7	237 57.5	-21 49.9	83 43.7	26 33.9
4	236 27.3	-15 12.2	197 38.6	267 55.8	-21 49.3	113 48.1	26 33.8
6	266 27.2	-15 10.6	227 43.6	297 54.1	-21 48.7	143 52.5	26 33.7
8	296 27.1	-15 9.0	257 48.5	327 52.4	-21 48.1	173 56.9	26 33.7
10	326 27.1	-15 7.4	287 53.4	357 50.8	-21 47.5	204 1.2	26 33.6
12	356 27.0	-15 5.9	317 58.4	27 49.1	-21 46.9	234 5.6	26 33.5
14	26 27.0	-15 4.3	348 3.3	57 47.4	-21 46.3	264 9.9	26 33.5
16	56 26.9	-15 2.7	18 8.2	87 45.7	-21 45.7	294 14.3	26 33.4
18	86 26.9	-15 1.1	48 13.1	117 44.0	-21 45.1	324 18.6	26 33.3
20	116 26.8	-14 59.5	78 18.1	147 42.3	-21 44.5	354 22.9	26 33.3
22	146 26.7	-14 57.9	108 23.0	177 40.6	-21 43.9	24 27.3	26 33.2
Δ	0	8		-8	3	22	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	166 22.9	124	-11 42.3	147	215 7.5	-22 50.4	338 36.1	10 49.7
2	195 25.7	124	-11 13.0	148	245 11.4	-22 50.3	8 41.3	10 49.8
4	224 28.6	125	-10 43.3	149	275 15.2	-22 50.2	38 46.6	10 50.0
6	253 31.6	126	-10 13.4	151	305 19.0	-22 50.1	68 51.9	10 50.1
8	282 34.7	126	- 9 43.3	152	335 22.8	-22 50.0	98 57.2	10 50.3
10	311 37.9	127	- 9 12.9	153	5 26.6	-22 50.0	129 2.4	10 50.4
12	340 41.3	127	- 8 42.3	154	35 30.4	-22 49.9	159 7.7	10 50.6
14	9 44.7	127	- 8 11.6	155	65 34.3	-22 49.8	189 13.0	10 50.7
16	38 48.1	128	- 7 40.6	156	95 38.1	-22 49.7	219 18.3	10 50.9
18	67 51.7	128	- 7 9.4	157	125 41.9	-22 49.6	249 23.6	10 51.0
20	96 55.3	128	- 6 38.1	157	155 45.7	-22 49.6	279 28.8	10 51.2
22	125 59.0	129	- 6 6.6	158	185 49.5	-22 49.5	309 34.1	10 51.3
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 58	16 31	0 46	2 24	8 20	.0	18 39	4.0
55	7 39	16 50	0 39	2 4	8 8	.3	18 49	3.6
50	7 24	17 5	0 34	1 50	7 58	.6	18 56	3.3
45	7 12	17 17	0 31	1 40	7 50	.8	19 2	3.1
40	7 2	17 27	0 28	1 32	7 43	1.0	19 7	2.9
35	6 54	17 35	0 26	1 26	7 38	1.2	19 11	2.7
30	6 46	17 43	0 25	1 21	7 32	1.3	19 14	2.6
20	6 33	17 55	0 23	1 15	7 24	1.5	19 21	2.4
10	6 22	18 7	0 22	1 12	7 16	1.7	19 26	2.1
0	6 11	18 18	0 21	1 11	7 9	1.9	19 31	1.9
10	5 60	18 29	0 22	1 13	7 1	2.1	19 36	1.7
20	5 48	18 40	0 23	1 18	6 53	2.4	19 41	1.5
30	5 34	18 54	0 25	1 27	6 44	2.6	19 47	1.3
35	5 26	19 2	0 27	1 34	6 39	2.7	19 50	1.1
40	5 17	19 11	0 29	1 43	6 33	2.9	19 54	1.0
45	5 6	19 21	0 32	1 57	6 27	3.1	19 58	.8
50	4 53	19 34	0 37	2 19	6 18	3.3	20 3	.6
55	4 36	19 51	0 43	3 3	6 8	3.6	20 9	.3
60	4 14	20 13	0 53	: ::	5 54	4.0	20 17	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-14 10.2	-.1	16.2	$T_{\overline{m}}$ 13 20	1.9	57.7	15.7
12	-14 11.6	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost .8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 9	.1	71	-3.9	♃	9 38	.0	78	-1.7
♂	20 22	.2	276	-.4	♄	1 25	.0	201	.4

9. FEBRUAR SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.7	-14 56.4	138 27.9	207 39.0	-21 43.3	54 31.6	26 33.1
2	206 26.6	-14 54.8	168 32.9	237 37.3	-21 42.6	84 35.9	26 33.0
4	236 26.6	-14 53.2	198 37.8	267 35.6	-21 42.0	114 40.2	26 33.0
6	266 26.6	-14 51.6	228 42.7	297 33.9	-21 41.4	144 44.5	26 32.9
8	296 26.5	-14 50.0	258 47.6	327 32.2	-21 40.7	174 48.8	26 32.8
10	326 26.5	-14 48.4	288 52.6	357 30.6	-21 40.1	204 53.1	26 32.8
12	356 26.4	-14 46.8	318 57.5	27 28.9	-21 39.4	234 57.4	26 32.7
14	26 26.4	-14 45.2	349 2.4	57 27.2	-21 38.8	265 1.7	26 32.6
16	56 26.3	-14 43.6	19 7.4	87 25.5	-21 38.1	295 6.0	26 32.6
18	86 26.3	-14 42.0	49 12.3	117 23.8	-21 37.5	325 10.3	26 32.5
20	116 26.3	-14 40.4	79 17.2	147 22.2	-21 36.8	355 14.6	26 32.4
22	146 26.2	-14 38.8	109 22.1	177 20.5	-21 36.1	25 18.8	26 32.4
Δ	0	8		-8	3	21	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 2.7	129	- 5 34.9	159	215 53.4	-22 49.4	339 39.4	10 51.5
2	184 6.5	129	- 5 3.1	160	245 57.2	-22 49.3	9 44.7	10 51.6
4	213 10.3	129	- 4 31.2	160	276 1.0	-22 49.2	39 49.9	10 51.8
6	242 14.1	129	- 3 59.2	161	306 4.8	-22 49.2	69 55.2	10 51.9
8	271 17.9	129	- 3 27.0	161	336 8.7	-22 49.1	100 .5	10 52.1
10	300 21.7	129	- 2 54.8	162	6 12.5	-22 49.0	130 5.8	10 52.2
12	329 25.5	129	- 2 22.4	162	36 16.3	-22 48.9	160 11.1	10 52.4
14	358 29.4	129	- 1 50.0	162	66 20.1	-22 48.8	190 16.4	10 52.5
16	27 33.1	129	- 1 17.5	163	96 24.0	-22 48.7	220 21.6	10 52.7
18	56 36.9	129	- 0 44.9	163	126 27.8	-22 48.7	250 26.9	10 52.8
20	85 40.6	128	- 0 12.4	163	156 31.6	-22 48.6	280 32.2	10 53.0
22	114 44.3	128	0 20.3	163	186 35.4	-22 48.5	310 37.5	10 53.1
Δ					19	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 56	16 34	0 45	2 23	8 20	.0	20 15	4.0
55	7 37	16 53	0 39	2 4	8 16	.3	20 16	3.7
50	7 22	17 7	0 34	1 50	8 12	.6	20 16	3.4
45	7 11	17 18	0 31	1 40	8 10	.8	20 16	3.1
40	7 1	17 28	0 28	1 32	8 7	1.0	20 17	2.9
35	6 53	17 36	0 26	1 26	8 5	1.1	20 17	2.8
30	6 45	17 43	0 25	1 21	8 4	1.3	20 17	2.6
20	6 33	17 56	0 23	1 15	8 0	1.5	20 17	2.4
10	6 21	18 7	0 22	1 12	7 58	1.7	20 17	2.2
0	6 11	18 18	0 21	1 11	7 55	1.9	20 17	2.0
10	5 60	18 28	0 22	1 13	7 53	2.1	20 17	1.8
20	5 48	18 40	0 23	1 18	7 50	2.4	20 17	1.5
30	5 35	18 53	0 25	1 26	7 47	2.6	20 17	1.3
35	5 27	19 1	0 27	1 33	7 45	2.8	20 17	1.2
40	5 18	19 10	0 29	1 43	7 43	2.9	20 17	1.0
45	5 8	19 20	0 32	1 56	7 41	3.1	20 17	.8
50	4 55	19 33	0 36	2 17	7 38	3.4	20 17	.6
55	4 39	19 49	0 42	2 59	7 35	3.6	20 17	.3
60	4 17	20 10	0 52	: ::	7 30	4.0	20 17	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-14 13.0	-.1	16.2	$T_{\overline{m}}$ 14 6	2.0	58.2	15.8
12	-14 14.0	$T_{\overline{m}_\odot}$ 12 h 14.2 min		Starost 1.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 10	.1	69	-3.9	♃	9 35	.0	77	-1.7
♂	20 19	.2	276	-.4	♄	1 21	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.2	-14 37.2	139 27.1	207 18.8	-21 35.4	55 23.1	26 32.3
2	206 26.2	-14 35.6	169 32.0	237 17.2	-21 34.8	85 27.4	26 32.2
4	236 26.1	-14 33.9	199 36.9	267 15.5	-21 34.1	115 31.6	26 32.1
6	266 26.1	-14 32.3	229 41.9	297 13.8	-21 33.4	145 35.9	26 32.1
8	296 26.1	-14 30.7	259 46.8	327 12.2	-21 32.7	175 40.1	26 32.0
10	326 26.0	-14 29.1	289 51.7	357 10.5	-21 32.0	205 44.3	26 31.9
12	356 26.0	-14 27.5	319 56.6	27 8.8	-21 31.3	235 48.6	26 31.9
14	26 26.0	-14 25.9	350 1.6	57 7.2	-21 30.6	265 52.8	26 31.8
16	56 26.0	-14 24.2	20 6.5	87 5.5	-21 29.9	295 57.0	26 31.7
18	86 26.0	-14 22.6	50 11.4	117 3.8	-21 29.2	326 1.2	26 31.7
20	116 25.9	-14 21.0	80 16.4	147 2.2	-21 28.4	356 5.4	26 31.6
22	146 25.9	-14 19.4	110 21.3	177 .5	-21 27.7	26 9.7	26 31.5
Δ	0	8		-8	4	21	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 47.9	128	0 52.9	163	216 39.3	-22 48.4	340 42.8	10 53.3
2	172 51.4	127	1 25.6	163	246 43.1	-22 48.3	10 48.0	10 53.4
4	201 54.9	127	1 58.2	163	276 46.9	-22 48.2	40 53.3	10 53.6
6	230 58.2	126	2 30.9	163	306 50.8	-22 48.2	70 58.6	10 53.8
8	260 1.5	126	3 3.5	163	336 54.6	-22 48.1	101 3.9	10 53.9
10	289 4.7	125	3 36.1	163	6 58.4	-22 48.0	131 9.2	10 54.1
12	318 7.7	125	4 8.6	162	37 2.2	-22 47.9	161 14.5	10 54.2
14	347 10.6	124	4 41.1	162	67 6.1	-22 47.8	191 19.8	10 54.4
16	16 13.4	123	5 13.5	162	97 9.9	-22 47.8	221 25.0	10 54.5
18	45 16.0	122	5 45.9	161	127 13.7	-22 47.7	251 30.3	10 54.7
20	74 18.5	122	6 18.1	161	157 17.6	-22 47.6	281 35.6	10 54.8
22	103 20.8	121	6 50.3	160	187 21.4	-22 47.5	311 40.9	10 55.0
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 53	16 36	0 45	2 23	8 20	.0	21 52	4.2
55	7 35	16 55	0 39	2 3	8 24	.4	21 44	3.8
50	7 21	17 9	0 34	1 50	8 27	.6	21 37	3.5
45	7 9	17 20	0 31	1 39	8 29	.8	21 32	3.2
40	6 60	17 29	0 28	1 32	8 31	1.0	21 27	3.0
35	6 52	17 37	0 26	1 26	8 33	1.2	21 23	2.9
30	6 45	17 44	0 25	1 21	8 34	1.3	21 20	2.7
20	6 32	17 57	0 23	1 15	8 37	1.6	21 14	2.5
10	6 21	18 7	0 22	1 12	8 39	1.8	21 9	2.2
0	6 11	18 18	0 21	1 11	8 42	2.0	21 4	2.0
10	6 0	18 28	0 22	1 13	8 44	2.2	20 59	1.8
20	5 49	18 39	0 23	1 17	8 47	2.4	20 54	1.6
30	5 36	18 52	0 25	1 26	8 50	2.7	20 48	1.4
35	5 28	18 60	0 27	1 33	8 51	2.8	20 45	1.2
40	5 19	19 9	0 29	1 42	8 53	3.0	20 41	1.1
45	5 9	19 19	0 32	1 55	8 56	3.2	20 37	.9
50	4 57	19 31	0 36	2 16	8 59	3.4	20 32	.7
55	4 41	19 46	0 42	2 56	9 2	3.7	20 25	.4
60	4 20	20 7	0 52	: ::	9 7	4.1	20 17	.0
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 15.0	-.1	16.2	$T_{\overline{m}}$	14 53	2.0	58.6	16.0
12	-14 15.6	$T_{\overline{m}_\odot}$	12 h 14.3 min	Starost	2.8 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 11	.1	68	-3.9	♃	9 32	.0	77	-1.7
♂	20 16	.2	276	-.3	♄	1 17	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 25.9	-14 17.7	140 26.2	206 58.8	-21 27.0	56 13.9	26 31.5
2	206 25.9	-14 16.1	170 31.1	236 57.2	-21 26.2	86 18.1	26 31.4
4	236 25.9	-14 14.5	200 36.1	266 55.5	-21 25.5	116 22.3	26 31.3
6	266 25.9	-14 12.8	230 41.0	296 53.9	-21 24.8	146 26.4	26 31.3
8	296 25.8	-14 11.2	260 45.9	326 52.2	-21 24.0	176 30.6	26 31.2
10	326 25.8	-14 9.6	290 50.8	356 50.6	-21 23.3	206 34.8	26 31.1
12	356 25.8	-14 7.9	320 55.8	26 48.9	-21 22.5	236 39.0	26 31.1
14	26 25.8	-14 6.3	351 .7	56 47.3	-21 21.7	266 43.1	26 31.0
16	56 25.8	-14 4.7	21 5.6	86 45.6	-21 21.0	296 47.3	26 30.9
18	86 25.8	-14 3.0	51 10.6	116 44.0	-21 20.2	326 51.5	26 30.9
20	116 25.8	-14 1.4	81 15.5	146 42.3	-21 19.4	356 55.6	26 30.8
22	146 25.8	-13 59.7	111 20.4	176 40.7	-21 18.7	26 59.8	26 30.7
Δ	0	8		-8	4	21	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	132 22.9	120	7 22.3	159	217 25.2	-22 47.4	341 46.2	10 55.1
2	161 24.9	119	7 54.2	159	247 29.1	-22 47.3	11 51.5	10 55.3
4	190 26.6	118	8 25.9	158	277 32.9	-22 47.2	41 56.7	10 55.4
6	219 28.2	117	8 57.5	157	307 36.8	-22 47.2	72 2.0	10 55.6
8	248 29.5	116	9 28.9	156	337 40.6	-22 47.1	102 7.3	10 55.7
10	277 30.6	114	10 .2	155	7 44.4	-22 47.0	132 12.6	10 55.9
12	306 31.5	113	10 31.3	154	37 48.3	-22 46.9	162 17.9	10 56.0
14	335 32.1	112	11 2.1	153	67 52.1	-22 46.8	192 23.2	10 56.2
16	4 32.5	111	11 32.8	152	97 55.9	-22 46.7	222 28.5	10 56.3
18	33 32.6	109	12 3.2	151	127 59.8	-22 46.7	252 33.8	10 56.5
20	62 32.4	108	12 33.4	150	158 3.6	-22 46.6	282 39.0	10 56.6
22	91 32.0	106	13 3.3	148	188 7.5	-22 46.5	312 44.3	10 56.8
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 51	16 39	0 45	2 22	8 20	.0	23 33	4.4
55	7 33	16 57	0 38	2 3	8 32	.4	23 14	3.9
50	7 19	17 10	0 34	1 49	8 42	.7	23 0	3.6
45	7 8	17 21	0 31	1 39	8 49	1.0	22 49	3.3
40	6 59	17 30	0 28	1 31	8 56	1.1	22 40	3.1
35	6 51	17 38	0 26	1 26	9 1	1.3	22 32	2.9
30	6 44	17 45	0 25	1 21	9 6	1.4	22 25	2.8
20	6 32	17 57	0 23	1 15	9 15	1.7	22 13	2.6
10	6 21	18 8	0 22	1 12	9 22	1.9	22 3	2.3
0	6 11	18 18	0 21	1 11	9 30	2.1	21 53	2.2
10	6 1	18 28	0 22	1 13	9 37	2.3	21 43	2.0
20	5 49	18 39	0 23	1 17	9 45	2.5	21 33	1.8
30	5 37	18 51	0 25	1 26	9 54	2.8	21 21	1.5
35	5 29	18 59	0 27	1 33	9 59	2.9	21 15	1.4
40	5 21	19 7	0 29	1 42	10 5	3.1	21 7	1.2
45	5 10	19 17	0 32	1 55	10 12	3.3	20 58	1.0
50	4 58	19 29	0 36	2 15	10 21	3.5	20 48	.8
55	4 43	19 44	0 42	2 52	10 31	3.8	20 34	.5
60	4 22	20 4	0 51	: ::	10 45	4.3	20 17	.1
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 16.2	.0	16.2	$T_{\overline{m}}$	15 41	2.1	58.9	16.0
12	-14 16.4	$T_{\overline{m}_\odot}$	12 h 14.3 min	Starost	3.8 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 13	.1	67	-3.8	♃	9 29	.0	77	-1.7
♂	20 12	.2	276	-.3	♄	1 13	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 25.8	-13 58.1	141 25.3	206 39.0	-21 17.9	57 3.9	26 30.7
2	206 25.8	-13 56.4	171 30.3	236 37.4	-21 17.1	87 8.1	26 30.6
4	236 25.8	-13 54.8	201 35.2	266 35.7	-21 16.3	117 12.2	26 30.5
6	266 25.8	-13 53.1	231 40.1	296 34.1	-21 15.5	147 16.3	26 30.5
8	296 25.8	-13 51.5	261 45.1	326 32.4	-21 14.7	177 20.4	26 30.4
10	326 25.8	-13 49.8	291 50.0	356 30.8	-21 13.9	207 24.6	26 30.3
12	356 25.8	-13 48.2	321 54.9	26 29.2	-21 13.1	237 28.7	26 30.3
14	26 25.8	-13 46.5	351 59.8	56 27.5	-21 12.3	267 32.8	26 30.2
16	56 25.8	-13 44.8	22 4.8	86 25.9	-21 11.4	297 36.9	26 30.1
18	86 25.8	-13 43.2	52 9.7	116 24.2	-21 10.6	327 41.0	26 30.1
20	116 25.9	-13 41.5	82 14.6	146 22.6	-21 9.8	357 45.1	26 30.0
22	146 25.9	-13 39.8	112 19.6	176 21.0	-21 9.0	27 49.2	26 29.9
Δ	0	8		-8	4	21	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	120 31.3	105	13 33.0	147	218 11.3	-22 46.4	342 49.6	10 57.0
2	149 30.2	103	14 2.4	146	248 15.1	-22 46.3	12 54.9	10 57.1
4	178 28.9	102	14 31.5	144	278 19.0	-22 46.2	43 .2	10 57.3
6	207 27.3	100	15 .3	142	308 22.8	-22 46.2	73 5.5	10 57.4
8	236 25.4	99	15 28.8	141	338 26.7	-22 46.1	103 10.8	10 57.6
10	265 23.1	97	15 57.0	139	8 30.5	-22 46.0	133 16.1	10 57.7
12	294 20.5	95	16 24.8	137	38 34.4	-22 45.9	163 21.4	10 57.9
14	323 17.6	94	16 52.2	135	68 38.2	-22 45.8	193 26.7	10 58.0
16	352 14.3	92	17 19.3	134	98 42.1	-22 45.7	223 31.9	10 58.2
18	21 10.7	90	17 46.0	132	128 45.9	-22 45.6	253 37.2	10 58.3
20	50 6.7	88	18 12.3	130	158 49.7	-22 45.6	283 42.5	10 58.5
22	79 2.4	87	18 38.2	127	188 53.6	-22 45.5	313 47.8	10 58.6
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 48	16 42	0 45	2 22	8 21	.1	. . .	.0
55	7 30	16 59	0 38	2 3	8 43	.6	. . .	.0
50	7 17	17 12	0 34	1 49	8 59	.9	. . .	.0
45	7 6	17 23	0 30	1 39	9 12	1.2	. . .	.0
40	6 58	17 32	0 28	1 31	9 23	1.3	23 54	3.2
35	6 50	17 39	0 26	1 25	9 32	1.5	23 42	3.0
30	6 43	17 46	0 25	1 21	9 41	1.6	23 32	2.9
20	6 31	17 58	0 23	1 15	9 55	1.9	23 14	2.7
10	6 21	18 8	0 22	1 11	10 8	2.1	22 59	2.5
0	6 11	18 18	0 21	1 11	10 20	2.2	22 45	2.3
10	6 1	18 28	0 22	1 13	10 32	2.4	22 31	2.1
20	5 50	18 38	0 23	1 17	10 45	2.6	22 15	2.0
30	5 37	18 51	0 25	1 26	10 60	2.8	21 58	1.8
35	5 30	18 58	0 27	1 32	11 9	3.0	21 48	1.6
40	5 22	19 6	0 29	1 41	11 19	3.1	21 37	1.5
45	5 12	19 16	0 32	1 54	11 31	3.3	21 23	1.3
50	5 0	19 27	0 36	2 14	11 45	3.6	21 7	1.1
55	4 45	19 42	0 42	2 49	12 4	4.0	20 46	.7
60	4 25	20 2	0 51	: ::	12 29	4.5	20 19	.2
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 16.7	.0	16.2	$T_{\overline{m}}$	16 32	2.3	59.1	16.1
12	-14 16.5	$T_{\overline{m}_\odot}$	12 h 14.3 min	Starost	4.8 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 14	.1	65	-3.8	♃	9 26	.0	77	-1.8
♂	20 9	.2	276	-.3	♄	1 8	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 25.9	-13 38.2	142 24.5	206 19.3	-21 8.1	57 53.3	26 29.9
2	206 25.9	-13 36.5	172 29.4	236 17.7	-21 7.3	87 57.3	26 29.8
4	236 25.9	-13 34.8	202 34.3	266 16.1	-21 6.4	118 1.4	26 29.7
6	266 25.9	-13 33.2	232 39.3	296 14.5	-21 5.6	148 5.5	26 29.7
8	296 26.0	-13 31.5	262 44.2	326 12.8	-21 4.7	178 9.6	26 29.6
10	326 26.0	-13 29.8	292 49.1	356 11.2	-21 3.9	208 13.6	26 29.5
12	356 26.0	-13 28.1	322 54.1	26 9.6	-21 3.0	238 17.7	26 29.5
14	26 26.0	-13 26.5	352 59.0	56 8.0	-21 2.2	268 21.7	26 29.4
16	56 26.1	-13 24.8	23 3.9	86 6.3	-21 1.3	298 25.8	26 29.3
18	86 26.1	-13 23.1	53 8.8	116 4.7	-21 .4	328 29.8	26 29.3
20	116 26.1	-13 21.4	83 13.8	146 3.1	-20 59.5	358 33.9	26 29.2
22	146 26.1	-13 19.7	113 18.7	176 1.5	-20 58.7	28 37.9	26 29.1
Δ	0	8		-8	4	20	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	107 57.7	85	19 3.7	125	218 57.4	-22 45.4	343 53.1	10 58.8
2	136 52.7	83	19 28.8	123	249 1.3	-22 45.3	13 58.4	10 58.9
4	165 47.3	81	19 53.4	121	279 5.1	-22 45.2	44 3.7	10 59.1
6	194 41.5	79	20 17.5	118	309 9.0	-22 45.1	74 9.0	10 59.3
8	223 35.3	77	20 41.2	116	339 12.8	-22 45.0	104 14.3	10 59.4
10	252 28.8	75	21 4.4	113	9 16.7	-22 45.0	134 19.6	10 59.6
12	281 21.9	74	21 27.1	111	39 20.5	-22 44.9	164 24.9	10 59.7
14	310 14.6	72	21 49.3	108	69 24.4	-22 44.8	194 30.2	10 59.9
16	339 6.9	70	22 10.9	106	99 28.2	-22 44.7	224 35.4	11 .0
18	7 58.9	68	22 32.0	103	129 32.1	-22 44.6	254 40.7	11 .2
20	36 50.5	66	22 52.6	100	159 35.9	-22 44.5	284 46.0	11 .3
22	65 41.8	64	23 12.6	97	189 39.8	-22 44.4	314 51.3	11 .5
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 45	16 44	0 44	2 22	8 24	.3	1 20	4.6
55	7 28	17 1	0 38	2 3	8 57	.9	0 49	3.9
50	7 15	17 14	0 34	1 49	9 21	1.2	0 26	3.6
45	7 5	17 24	0 30	1 39	9 40	1.5	0 9	3.3
40	6 56	17 33	0 28	1 31	9 55	1.7	. . .	.0
35	6 49	17 40	0 26	1 25	10 9	1.8	. . .	.0
30	6 42	17 47	0 25	1 21	10 20	1.9	. . .	.0
20	6 31	17 58	0 23	1 14	10 40	2.1	. . .	.0
10	6 21	18 8	0 22	1 11	10 57	2.3	23 59	2.6
0	6 11	18 18	0 21	1 11	11 13	2.4	23 40	2.5
10	6 1	18 27	0 22	1 12	11 30	2.5	23 22	2.4
20	5 50	18 38	0 23	1 17	11 48	2.7	23 3	2.2
30	5 38	18 50	0 25	1 25	12 8	2.9	22 40	2.1
35	5 31	18 57	0 27	1 32	12 20	3.0	22 27	2.0
40	5 23	19 5	0 29	1 41	12 34	3.1	22 12	1.8
45	5 13	19 14	0 32	1 53	12 51	3.3	21 54	1.7
50	5 2	19 26	0 36	2 12	13 11	3.6	21 32	1.5
55	4 47	19 40	0 41	2 47	13 39	3.9	21 4	1.1
60	4 28	19 59	0 50	: ::	14 18	4.6	20 22	.4
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 16.3	.0	16.2	$T_{\overline{m}}$	17 27	2.4	59.2	16.1
12	-14 15.7	$T_{\overline{m}_\odot}$	12 h 14.3 min	Starost	5.8 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 15	.1	64	-3.8	♃	9 23	.0	77	-1.8
♂	20 6	.2	275	-.2	♄	1 4	.0	201	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.2	-13 18.1	143 23.6	205 59.8	-20 57.8	58 41.9	26 29.1
2	206 26.2	-13 16.4	173 28.6	235 58.2	-20 56.9	88 46.0	26 29.0
4	236 26.2	-13 14.7	203 33.5	265 56.6	-20 56.0	118 50.0	26 28.9
6	266 26.3	-13 13.0	233 38.4	295 55.0	-20 55.1	148 54.0	26 28.9
8	296 26.3	-13 11.3	263 43.3	325 53.4	-20 54.2	178 58.0	26 28.8
10	326 26.3	-13 9.6	293 48.3	355 51.8	-20 53.3	209 2.0	26 28.7
12	356 26.4	-13 7.9	323 53.2	25 50.2	-20 52.4	239 6.0	26 28.7
14	26 26.4	-13 6.2	353 58.1	55 48.6	-20 51.4	269 10.0	26 28.6
16	56 26.5	-13 4.5	24 3.0	85 46.9	-20 50.5	299 14.0	26 28.5
18	86 26.5	-13 2.8	54 8.0	115 45.3	-20 49.6	329 18.0	26 28.5
20	116 26.5	-13 1.1	84 12.9	145 43.7	-20 48.7	359 22.0	26 28.4
22	146 26.6	-12 59.4	114 17.8	175 42.1	-20 47.7	29 26.0	26 28.4
Δ	0	8		-8	5	20	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	94 32.6	63	23 32.0	94	219 43.7	-22 44.4	344 56.6	11 .6
2	123 23.1	61	23 50.9	91	249 47.5	-22 44.3	15 1.9	11 .8
4	152 13.3	59	24 9.1	88	279 51.4	-22 44.2	45 7.2	11 .9
6	181 3.1	57	24 26.7	85	309 55.2	-22 44.1	75 12.5	11 1.1
8	209 52.6	56	24 43.7	82	339 59.1	-22 44.0	105 17.8	11 1.3
10	238 41.7	54	25 .1	79	10 2.9	-22 43.9	135 23.1	11 1.4
12	267 30.5	52	25 15.9	75	40 6.8	-22 43.8	165 28.4	11 1.6
14	296 19.0	51	25 30.9	72	70 10.7	-22 43.8	195 33.7	11 1.7
16	325 7.2	49	25 45.3	69	100 14.5	-22 43.7	225 39.0	11 1.9
18	353 55.1	48	25 59.1	65	130 18.4	-22 43.6	255 44.3	11 2.0
20	22 42.7	47	26 12.1	62	160 22.2	-22 43.5	285 49.6	11 2.2
22	51 30.0	45	26 24.5	58	190 26.1	-22 43.4	315 54.9	11 2.3
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 43	16 47	0 44	2 21	8 32	.8	3 10	4.5
55	7 26	17 3	0 38	2 3	9 19	1.5	2 23	3.7
50	7 14	17 16	0 34	1 49	9 51	1.8	1 52	3.4
45	7 4	17 26	0 30	1 39	10 16	1.9	1 29	3.2
40	6 55	17 34	0 28	1 31	10 35	2.1	1 10	3.1
35	6 48	17 41	0 26	1 25	10 51	2.1	0 55	3.0
30	6 41	17 47	0 25	1 21	11 6	2.2	0 41	2.9
20	6 30	17 59	0 23	1 14	11 30	2.3	0 18	2.7
10	6 20	18 8	0 22	1 11	11 51	2.4	.. ..	.0
0	6 11	18 18	0 21	1 11	12 11	2.5	.. ..	.0
10	6 1	18 27	0 22	1 12	12 31	2.6	.. ..	.0
20	5 51	18 37	0 23	1 17	12 53	2.7	23 56	2.5
30	5 39	18 49	0 25	1 25	13 18	2.8	23 30	2.4
35	5 32	18 56	0 27	1 32	13 32	2.9	23 14	2.3
40	5 24	19 4	0 29	1 40	13 50	3.0	22 56	2.3
45	5 15	19 13	0 32	1 53	14 10	3.1	22 35	2.2
50	5 4	19 24	0 35	2 11	14 37	3.2	22 8	2.1
55	4 49	19 38	0 41	2 44	15 12	3.5	21 31	1.8
60	4 31	19 56	0 50	: ::	16 9	4.2	20 33	1.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 15.2	.1	16.2	$T_{\overline{m}}$	18 25	2.6	59.2	16.1
12	-14 14.2	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost	6.8 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 17	.1	63	-3.8	♃	9 20	.0	76	-1.8
♂	20 3	.2	275	-.2	♄	1 0	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 26.6	-12 57.7	144 22.8	205 40.5	-20 46.8	59 29.9	26 28.3
2	206 26.7	-12 56.0	174 27.7	235 38.9	-20 45.8	89 33.9	26 28.2
4	236 26.7	-12 54.3	204 32.6	265 37.3	-20 44.9	119 37.9	26 28.2
6	266 26.8	-12 52.6	234 37.5	295 35.7	-20 43.9	149 41.8	26 28.1
8	296 26.8	-12 50.9	264 42.5	325 34.1	-20 43.0	179 45.8	26 28.0
10	326 26.9	-12 49.2	294 47.4	355 32.5	-20 42.0	209 49.8	26 28.0
12	356 26.9	-12 47.5	324 52.3	25 30.9	-20 41.1	239 53.7	26 27.9
14	26 27.0	-12 45.8	354 57.3	55 29.4	-20 40.1	269 57.6	26 27.8
16	56 27.1	-12 44.1	25 2.2	85 27.8	-20 39.1	300 1.6	26 27.8
18	86 27.1	-12 42.3	55 7.1	115 26.2	-20 38.1	330 5.5	26 27.7
20	116 27.2	-12 40.6	85 12.0	145 24.6	-20 37.2	0 9.5	26 27.6
22	146 27.2	-12 38.9	115 17.0	175 23.0	-20 36.2	30 13.4	26 27.6
Δ	0	9		-8	5	20	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 17.1	44	26 36.2	55	220 30.0	-22 43.3	346 .2	11 2.5
2	109 3.9	43	26 47.1	51	250 33.8	-22 43.2	16 5.5	11 2.6
4	137 50.5	42	26 57.3	48	280 37.7	-22 43.1	46 10.8	11 2.8
6	166 36.8	41	27 6.8	44	310 41.5	-22 43.1	76 16.1	11 3.0
8	195 23.0	40	27 15.6	40	340 45.4	-22 43.0	106 21.4	11 3.1
10	224 9.0	39	27 23.7	37	10 49.3	-22 42.9	136 26.6	11 3.3
12	252 54.8	38	27 30.9	33	40 53.1	-22 42.8	166 31.9	11 3.4
14	281 40.5	38	27 37.5	29	70 57.0	-22 42.7	196 37.2	11 3.6
16	310 26.0	37	27 43.3	25	101 .9	-22 42.6	226 42.5	11 3.7
18	339 11.5	37	27 48.3	21	131 4.7	-22 42.5	256 47.8	11 3.9
20	7 56.8	36	27 52.6	18	161 8.6	-22 42.4	286 53.1	11 4.0
22	36 42.1	36	27 56.1	14	191 12.5	-22 42.4	316 58.4	11 4.2
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 40	16 49	0 44	2 21	8 50	2.0	4 57	3.5
55	7 24	17 5	0 38	2 2	9 54	2.3	3 53	3.1
50	7 12	17 17	0 33	1 49	10 33	2.4	3 14	3.0
45	7 2	17 27	0 30	1 39	11 2	2.5	2 46	2.9
40	6 54	17 35	0 28	1 31	11 24	2.5	2 24	2.8
35	6 47	17 42	0 26	1 25	11 43	2.5	2 6	2.8
30	6 41	17 48	0 24	1 20	11 59	2.5	1 50	2.7
20	6 30	17 59	0 23	1 14	12 26	2.6	1 24	2.7
10	6 20	18 9	0 21	1 11	12 50	2.6	1 1	2.6
0	6 11	18 18	0 21	1 10	13 12	2.6	0 40	2.6
10	6 1	18 27	0 22	1 12	13 34	2.6	0 19	2.5
20	5 51	18 37	0 23	1 17	13 58	2.6	.. ..	.0
30	5 40	18 48	0 25	1 25	14 26	2.6	.. ..	.0
35	5 33	18 55	0 27	1 31	14 42	2.6	.. ..	.0
40	5 25	19 2	0 29	1 40	15 1	2.6	23 51	2.7
45	5 16	19 11	0 31	1 52	15 25	2.6	23 27	2.7
50	5 5	19 22	0 35	2 10	15 54	2.6	22 57	2.7
55	4 52	19 36	0 41	2 42	16 36	2.6	22 15	2.8
60	4 33	19 53	0 49	: ::	17 50	2.6	21 1	2.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 13.3	.1	16.2	$T_{\overline{m}}$	19 27	2.6	59.2	16.1
12	-14 11.9	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost	7.8 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 18	.1	61	-3.8	♃	9 17	.0	76	-1.8
♂	19 59	.2	275	-.2	♄	0 56	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 27.3	-12 37.2	145 21.9	205 21.4	-20 35.2	60 17.3	26 27.5
2	206 27.4	-12 35.5	175 26.8	235 19.8	-20 34.2	90 21.2	26 27.4
4	236 27.4	-12 33.7	205 31.8	265 18.2	-20 33.2	120 25.1	26 27.4
6	266 27.5	-12 32.0	235 36.7	295 16.7	-20 32.2	150 29.0	26 27.3
8	296 27.6	-12 30.3	265 41.6	325 15.1	-20 31.2	180 32.9	26 27.2
10	326 27.6	-12 28.6	295 46.5	355 13.5	-20 30.2	210 36.8	26 27.2
12	356 27.7	-12 26.8	325 51.5	25 11.9	-20 29.2	240 40.7	26 27.1
14	26 27.8	-12 25.1	355 56.4	55 10.3	-20 28.1	270 44.6	26 27.1
16	56 27.8	-12 23.4	26 1.3	85 8.8	-20 27.1	300 48.5	26 27.0
18	86 27.9	-12 21.7	56 6.3	115 7.2	-20 26.1	330 52.4	26 26.9
20	116 28.0	-12 19.9	86 11.2	145 5.6	-20 25.1	0 56.3	26 26.9
22	146 28.1	-12 18.2	116 16.1	175 4.1	-20 24.0	31 .1	26 26.8
Δ	0	9		-8	5	19	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	65 27.3	36	27 58.8	10	221 16.3	-22 42.3	347 3.7	11 4.3
2	94 12.5	36	28 .8	6	251 20.2	-22 42.2	17 9.0	11 4.5
4	122 57.6	36	28 2.0	2	281 24.1	-22 42.1	47 14.3	11 4.7
6	151 42.8	36	28 2.5	-2	311 27.9	-22 42.0	77 19.6	11 4.8
8	180 28.0	36	28 2.1	-5	341 31.8	-22 41.9	107 24.9	11 5.0
10	209 13.2	37	28 1.1	-9	11 35.7	-22 41.8	137 30.2	11 5.1
12	237 58.5	37	27 59.2	-13	41 39.6	-22 41.7	167 35.5	11 5.3
14	266 43.9	38	27 56.6	-17	71 43.4	-22 41.7	197 40.8	11 5.4
16	295 29.4	38	27 53.2	-21	101 47.3	-22 41.6	227 46.1	11 5.6
18	324 15.1	39	27 49.1	-24	131 51.2	-22 41.5	257 51.4	11 5.7
20	353 .8	40	27 44.2	-28	161 55.1	-22 41.4	287 56.7	11 5.9
22	21 46.8	41	27 38.5	-32	191 58.9	-22 41.3	318 2.0	11 6.1
Δ					19	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 37	16 52	0 44	2 21	9 37	3.7	6 20	1.7
55	7 22	17 7	0 38	2 2	10 49	3.2	5 7	2.2
50	7 10	17 19	0 33	1 49	11 31	3.0	4 25	2.3
45	7 1	17 28	0 30	1 39	12 1	2.9	3 56	2.4
40	6 53	17 36	0 28	1 31	12 24	2.9	3 32	2.4
35	6 46	17 43	0 26	1 25	12 43	2.8	3 13	2.5
30	6 40	17 49	0 24	1 20	13 0	2.8	2 56	2.5
20	6 29	17 59	0 22	1 14	13 28	2.7	2 28	2.5
10	6 20	18 9	0 21	1 11	13 52	2.6	2 4	2.6
0	6 11	18 18	0 21	1 10	14 14	2.5	1 42	2.6
10	6 2	18 26	0 22	1 12	14 37	2.5	1 19	2.6
20	5 52	18 36	0 23	1 16	15 1	2.4	0 55	2.6
30	5 41	18 47	0 25	1 25	15 29	2.3	0 27	2.7
35	5 34	18 54	0 26	1 31	15 45	2.3	0 10	2.7
40	5 27	19 1	0 29	1 40	16 5	2.2	. . .	.0
45	5 18	19 10	0 31	1 51	16 28	2.1	. . .	.0
50	5 7	19 20	0 35	2 9	16 58	1.9	. . .	.0
55	4 54	19 33	0 41	2 39	17 40	1.7	23 22	3.5
60	4 36	19 51	0 49	: ::	18 52	1.0	22 10	4.2
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 10.6	.1	16.2	$T_{\overline{m}}$	20 29	2.5	59.1	16.1
12	-14 8.9	$T_{\overline{m}_\odot}$	12 h 14.2 min	Starost	8.8 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 19	.1	60	-3.8	♄	9 14	.0	76	-1.8
♂	19 56	.2	275	-.2	♃	0 52	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 28.1	-12 16.4	146 21.0	205 2.5	-20 23.0	61 4.0	26 26.7
2	206 28.2	-12 14.7	176 26.0	235 .9	-20 21.9	91 7.9	26 26.7
4	236 28.3	-12 13.0	206 30.9	264 59.4	-20 20.9	121 11.7	26 26.6
6	266 28.4	-12 11.2	236 35.8	294 57.8	-20 19.8	151 15.6	26 26.5
8	296 28.5	-12 9.5	266 40.8	324 56.2	-20 18.8	181 19.5	26 26.5
10	326 28.6	-12 7.7	296 45.7	354 54.7	-20 17.7	211 23.3	26 26.4
12	356 28.6	-12 6.0	326 50.6	24 53.1	-20 16.7	241 27.1	26 26.3
14	26 28.7	-12 4.3	356 55.5	54 51.5	-20 15.6	271 31.0	26 26.3
16	56 28.8	-12 2.5	27 .5	84 50.0	-20 14.5	301 34.8	26 26.2
18	86 28.9	-12 .8	57 5.4	114 48.4	-20 13.4	331 38.6	26 26.1
20	116 29.0	-11 59.0	87 10.3	144 46.9	-20 12.4	1 42.5	26 26.1
22	146 29.1	-11 57.3	117 15.3	174 45.3	-20 11.3	31 46.3	26 26.0
Δ	0	9		-8	5	19	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	50 32.9	42	27 32.2	-36	222 2.8	-22 41.2	348 7.3	11 6.2
2	79 19.2	43	27 25.1	-39	252 6.7	-22 41.1	18 12.6	11 6.4
4	108 5.8	44	27 17.2	-43	282 10.6	-22 41.0	48 17.9	11 6.5
6	136 52.6	45	27 8.7	-46	312 14.4	-22 40.9	78 23.2	11 6.7
8	165 39.6	47	26 59.4	-50	342 18.3	-22 40.9	108 28.5	11 6.8
10	194 26.9	48	26 49.4	-53	12 22.2	-22 40.8	138 33.8	11 7.0
12	223 14.5	49	26 38.7	-57	42 26.1	-22 40.7	168 39.1	11 7.1
14	252 2.4	51	26 27.4	-60	72 30.0	-22 40.6	198 44.4	11 7.3
16	280 50.6	53	26 15.3	-64	102 33.8	-22 40.5	228 49.7	11 7.4
18	309 39.1	54	26 2.6	-67	132 37.7	-22 40.4	258 55.0	11 7.6
20	338 28.0	56	25 49.3	-70	162 41.6	-22 40.3	289 .3	11 7.8
22	7 17.2	58	25 35.2	-73	192 45.5	-22 40.2	319 5.6	11 7.9
Δ					19	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 34	16 55	0 44	2 21	11 5	4.4	7 1	.7
55	7 20	17 9	0 38	2 2	12 6	3.7	5 59	1.4
50	7 8	17 21	0 33	1 48	12 44	3.4	5 21	1.7
45	6 59	17 30	0 30	1 38	13 11	3.2	4 53	1.8
40	6 51	17 37	0 28	1 31	13 33	3.0	4 30	2.0
35	6 45	17 44	0 26	1 25	13 51	2.9	4 12	2.1
30	6 39	17 50	0 24	1 20	14 6	2.8	3 56	2.2
20	6 28	17 60	0 22	1 14	14 32	2.7	3 29	2.3
10	6 19	18 9	0 21	1 11	14 55	2.5	3 6	2.4
0	6 11	18 17	0 21	1 10	15 16	2.4	2 44	2.5
10	6 2	18 26	0 22	1 12	15 36	2.3	2 22	2.6
20	5 52	18 35	0 23	1 16	15 59	2.1	1 58	2.7
30	5 41	18 46	0 25	1 24	16 24	2.0	1 31	2.8
35	5 35	18 53	0 26	1 31	16 40	1.9	1 15	2.9
40	5 28	18 60	0 28	1 39	16 57	1.7	0 56	3.0
45	5 19	19 8	0 31	1 51	17 18	1.6	0 33	3.1
50	5 9	19 18	0 35	2 8	17 45	1.4	0 3	3.3
55	4 56	19 31	0 40	2 37	18 20	1.0	. . .	.0
60	4 39	19 48	0 48	: ::	19 15	.4	23 52	4.5
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-14 7.2	.2	16.2	$T_{\overline{m}}$	21 30	2.3	58.9	16.0
12	-14 5.2	$T_{\overline{m}_\odot}$	12 h 14.1 min	Starost	9.8 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 20	.1	59	-3.8	♄	9 11	.0	76	-1.8
♂	19 53	.2	275	-.1	♃	0 47	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 29.2	-11 55.5	147 20.2	204 43.8	-20 10.2	61 50.1	26 25.9
2	206 29.3	-11 53.8	177 25.1	234 42.2	-20 9.1	91 53.9	26 25.9
4	236 29.4	-11 52.0	207 30.0	264 40.7	-20 8.0	121 57.7	26 25.8
6	266 29.5	-11 50.2	237 35.0	294 39.1	-20 6.9	152 1.5	26 25.8
8	296 29.6	-11 48.5	267 39.9	324 37.6	-20 5.8	182 5.3	26 25.7
10	326 29.7	-11 46.7	297 44.8	354 36.0	-20 4.7	212 9.1	26 25.6
12	356 29.8	-11 45.0	327 49.7	24 34.5	-20 3.6	242 12.9	26 25.6
14	26 29.9	-11 43.2	357 54.7	54 32.9	-20 2.4	272 16.7	26 25.5
16	56 30.0	-11 41.5	27 59.6	84 31.4	-20 1.3	302 20.5	26 25.4
18	86 30.1	-11 39.7	58 4.5	114 29.9	-20 .2	332 24.3	26 25.4
20	116 30.2	-11 37.9	88 9.5	144 28.3	-19 59.1	2 28.1	26 25.3
22	146 30.3	-11 36.2	118 14.4	174 26.8	-19 57.9	32 31.8	26 25.2
Δ	1	9		-8	6	19	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	36 6.7	60	25 20.6	-76	222 49.4	-22 40.1	349 10.9	11 8.1
2	64 56.7	62	25 5.3	-79	252 53.3	-22 40.1	19 16.2	11 8.2
4	93 47.0	63	24 49.4	-82	282 57.1	-22 40.0	49 21.5	11 8.4
6	122 37.7	65	24 33.0	-85	313 1.0	-22 39.9	79 26.8	11 8.5
8	151 28.8	67	24 15.9	-88	343 4.9	-22 39.8	109 32.1	11 8.7
10	180 20.3	69	23 58.2	-91	13 8.8	-22 39.7	139 37.4	11 8.8
12	209 12.1	72	23 40.0	-94	43 12.7	-22 39.6	169 42.8	11 9.0
14	238 4.5	74	23 21.3	-96	73 16.6	-22 39.5	199 48.1	11 9.2
16	266 57.2	76	23 2.0	-99	103 20.5	-22 39.4	229 53.4	11 9.3
18	295 50.3	78	22 42.1	-102	133 24.3	-22 39.3	259 58.7	11 9.5
20	324 43.9	80	22 21.8	-104	163 28.2	-22 39.3	290 4.0	11 9.6
22	353 37.9	82	22 1.0	-107	193 32.1	-22 39.2	320 9.3	11 9.8
Δ					19	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 32	16 57	0 44	2 20	12 51	4.4	7 17	.3
55	7 17	17 12	0 37	2 2	13 35	3.8	6 32	.8
50	7 6	17 22	0 33	1 48	14 5	3.5	6 0	1.2
45	6 57	17 31	0 30	1 38	14 28	3.2	5 37	1.4
40	6 50	17 39	0 28	1 31	14 46	3.1	5 18	1.6
35	6 44	17 45	0 26	1 25	15 1	2.9	5 2	1.7
30	6 38	17 51	0 24	1 20	15 14	2.8	4 48	1.8
20	6 28	18 0	0 22	1 14	15 36	2.6	4 24	2.0
10	6 19	18 9	0 21	1 11	15 55	2.4	4 3	2.2
0	6 11	18 17	0 21	1 10	16 13	2.2	3 44	2.3
10	6 2	18 26	0 21	1 12	16 31	2.1	3 24	2.5
20	5 53	18 35	0 23	1 16	16 50	1.9	3 3	2.6
30	5 42	18 45	0 25	1 24	17 12	1.7	2 38	2.8
35	5 36	18 51	0 26	1 30	17 25	1.5	2 24	2.9
40	5 29	18 58	0 28	1 39	17 39	1.4	2 7	3.1
45	5 21	19 7	0 31	1 50	17 56	1.2	1 47	3.2
50	5 11	19 16	0 35	2 7	18 18	1.0	1 21	3.5
55	4 58	19 29	0 40	2 35	18 45	.7	0 47	3.8
60	4 41	19 45	0 48	3 50	19 24	.1	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-14 3.1	.2	16.2	$T_{\overline{m}}$ 22 26	2.2	58.6	16.0
12	-14 .7	$T_{\overline{m}_\odot}$ 12 h 14.0 min		Starost 10.8 d	Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 22	.1	57	-3.8	♃	9 8	.0	75	-1.8
♂	19 50	.2	274	-.1	♄	0 43	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 30.4	-11 34.4	148 19.3	204 25.3	-19 56.8	62 35.6	26 25.2
2	206 30.5	-11 32.6	178 24.2	234 23.7	-19 55.6	92 39.4	26 25.1
4	236 30.6	-11 30.9	208 29.2	264 22.2	-19 54.5	122 43.1	26 25.0
6	266 30.7	-11 29.1	238 34.1	294 20.7	-19 53.3	152 46.9	26 25.0
8	296 30.8	-11 27.3	268 39.0	324 19.1	-19 52.2	182 50.6	26 24.9
10	326 30.9	-11 25.5	298 44.0	354 17.6	-19 51.0	212 54.4	26 24.8
12	356 31.1	-11 23.8	328 48.9	24 16.1	-19 49.9	242 58.1	26 24.8
14	26 31.2	-11 22.0	358 53.8	54 14.6	-19 48.7	273 1.9	26 24.7
16	56 31.3	-11 20.2	28 58.7	84 13.1	-19 47.5	303 5.6	26 24.6
18	86 31.4	-11 18.4	59 3.7	114 11.5	-19 46.4	333 9.3	26 24.6
20	116 31.5	-11 16.6	89 8.6	144 10.0	-19 45.2	3 13.1	26 24.5
22	146 31.6	-11 14.9	119 13.5	174 8.5	-19 44.0	33 16.8	26 24.4
Δ	1	9		-8	6	19	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	22 32.3	84	21 39.7	-109	223 36.0	-22 39.1	350 14.6	11 9.9
2	51 27.1	86	21 17.9	-111	253 39.9	-22 39.0	20 19.9	11 10.1
4	80 22.4	88	20 55.6	-113	283 43.8	-22 38.9	50 25.2	11 10.2
6	109 18.1	91	20 33.0	-116	313 47.7	-22 38.8	80 30.5	11 10.4
8	138 14.2	93	20 9.8	-118	343 51.6	-22 38.7	110 35.8	11 10.6
10	167 10.8	95	19 46.3	-120	13 55.5	-22 38.6	140 41.1	11 10.7
12	196 7.7	97	19 22.4	-122	43 59.4	-22 38.5	170 46.4	11 10.9
14	225 5.1	99	18 58.1	-123	74 3.3	-22 38.4	200 51.7	11 11.0
16	254 2.9	101	18 33.4	-125	104 7.2	-22 38.4	230 57.0	11 11.2
18	283 1.1	103	18 8.3	-127	134 11.1	-22 38.3	261 2.3	11 11.3
20	311 59.7	105	17 42.9	-129	164 15.0	-22 38.2	291 7.6	11 11.5
22	340 58.7	107	17 17.2	-130	194 18.9	-22 38.1	321 12.9	11 11.6
Δ					19	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 29	16 60	0 43	2 20	14 37	4.2	7 24	.1
55	7 15	17 14	0 37	2 2	15 7	3.7	6 52	.6
50	7 4	17 24	0 33	1 48	15 29	3.4	6 28	.9
45	6 56	17 33	0 30	1 38	15 45	3.1	6 10	1.1
40	6 49	17 40	0 28	1 31	15 59	3.0	5 55	1.3
35	6 42	17 46	0 26	1 25	16 11	2.8	5 43	1.4
30	6 37	17 51	0 24	1 20	16 21	2.7	5 31	1.6
20	6 27	18 1	0 22	1 14	16 38	2.4	5 12	1.8
10	6 19	18 9	0 21	1 11	16 53	2.2	4 55	2.0
0	6 11	18 17	0 21	1 10	17 7	2.0	4 39	2.1
10	6 2	18 25	0 21	1 12	17 21	1.9	4 23	2.3
20	5 53	18 34	0 23	1 16	17 35	1.7	4 6	2.5
30	5 43	18 44	0 25	1 24	17 52	1.4	3 46	2.7
35	5 37	18 50	0 26	1 30	18 2	1.3	3 35	2.9
40	5 30	18 57	0 28	1 38	18 13	1.2	3 21	3.0
45	5 22	19 5	0 31	1 50	18 26	1.0	3 5	3.2
50	5 12	19 14	0 35	2 6	18 41	.7	2 45	3.5
55	5 0	19 26	0 40	2 33	19 1	.5	2 19	3.8
60	4 44	19 42	0 48	3 39	19 27	.0	1 42	4.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-13 58.3	.2	16.2	$T_{\overline{m}}$ 23 19	2.0	58.2	15.9
12	-13 55.5	$T_{\overline{m}_\odot}$ 12 h 13.9 min		Starost 11.8 d	Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 23	.1	56	-3.8	♃	9 4	.0	75	-1.8
♂	19 47	.2	274	-.1	♄	0 39	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 31.8	-11 13.1	149 18.5	204 7.0	-19 42.8	63 20.5	26 24.4
2	206 31.9	-11 11.3	179 23.4	234 5.5	-19 41.6	93 24.2	26 24.3
4	236 32.0	-11 9.5	209 28.3	264 4.0	-19 40.4	123 27.9	26 24.2
6	266 32.1	-11 7.7	239 33.2	294 2.4	-19 39.2	153 31.7	26 24.2
8	296 32.3	-11 5.9	269 38.2	324 .9	-19 38.0	183 35.4	26 24.1
10	326 32.4	-11 4.2	299 43.1	353 59.4	-19 36.8	213 39.1	26 24.1
12	356 32.5	-11 2.4	329 48.0	23 57.9	-19 35.6	243 42.8	26 24.0
14	26 32.6	-11 .6	359 53.0	53 56.4	-19 34.4	273 46.4	26 23.9
16	56 32.8	-10 58.8	29 57.9	83 54.9	-19 33.2	303 50.1	26 23.9
18	86 32.9	-10 57.0	60 2.8	113 53.4	-19 32.0	333 53.8	26 23.8
20	116 33.0	-10 55.2	90 7.7	143 51.9	-19 30.7	3 57.5	26 23.7
22	146 33.2	-10 53.4	120 12.7	173 50.4	-19 29.5	34 1.2	26 23.7
Δ	1	9		-8	6	18	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	9 58.2	109	16 51.1	-132	224 22.8	-22 38.0	351 18.2	11 11.8
2	38 58.0	111	16 24.8	-133	254 26.7	-22 37.9	21 23.5	11 12.0
4	67 58.2	113	15 58.1	-135	284 30.6	-22 37.8	51 28.8	11 12.1
6	96 58.7	115	15 31.2	-136	314 34.5	-22 37.7	81 34.1	11 12.3
8	125 59.7	117	15 4.0	-137	344 38.4	-22 37.6	111 39.4	11 12.4
10	155 1.0	118	14 36.5	-139	14 42.3	-22 37.5	141 44.7	11 12.6
12	184 2.7	120	14 8.8	-140	44 46.2	-22 37.4	171 50.0	11 12.7
14	213 4.7	122	13 40.9	-141	74 50.1	-22 37.4	201 55.4	11 12.9
16	242 7.1	124	13 12.7	-142	104 54.0	-22 37.3	232 .7	11 13.0
18	271 9.8	125	12 44.4	-143	134 57.9	-22 37.2	262 6.0	11 13.2
20	300 12.9	127	12 15.8	-144	165 1.8	-22 37.1	292 11.3	11 13.4
22	329 16.2	128	11 47.1	-145	195 5.7	-22 37.0	322 16.6	11 13.5
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 26	17 3	0 43	2 20	16 18	3.9	7 26	.0
55	7 13	17 16	0 37	2 1	16 36	3.5	7 5	.4
50	7 3	17 26	0 33	1 48	16 50	3.2	6 49	.7
45	6 54	17 34	0 30	1 38	17 1	3.0	6 36	.9
40	6 47	17 41	0 28	1 31	17 10	2.8	6 26	1.1
35	6 41	17 47	0 26	1 25	17 18	2.7	6 17	1.2
30	6 36	17 52	0 24	1 20	17 24	2.5	6 9	1.4
20	6 27	18 1	0 22	1 14	17 36	2.3	5 55	1.6
10	6 18	18 9	0 21	1 11	17 46	2.1	5 42	1.8
0	6 10	18 17	0 21	1 10	17 56	1.9	5 31	2.0
10	6 2	18 25	0 21	1 12	18 5	1.7	5 19	2.2
20	5 54	18 34	0 23	1 16	18 15	1.5	5 6	2.4
30	5 44	18 43	0 25	1 24	18 27	1.3	4 52	2.6
35	5 38	18 49	0 26	1 30	18 33	1.1	4 43	2.7
40	5 31	18 56	0 28	1 38	18 40	1.0	4 33	2.9
45	5 24	19 3	0 31	1 49	18 49	.8	4 22	3.1
50	5 14	19 12	0 35	2 5	18 59	.6	4 8	3.3
55	5 2	19 24	0 40	2 31	19 12	.3	3 50	3.6
60	4 47	19 39	0 47	3 31	19 28	.0	3 26	4.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 52.8	.3	16.2	$T_{\overline{m}}$	. . . .	1.0	57.8	15.7
12	-13 49.7	$T_{\overline{m}_\odot}$ 12 h 13.8 min		Starost 12.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 24	.1	55	-3.8	♃	9 1	.0	75	-1.8
♂	19 44	.2	274	-.1	♄	0 35	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 33.3	-10 51.6	150 17.6	203 48.9	-19 28.3	64 4.8	26 23.6
2	206 33.4	-10 49.8	180 22.5	233 47.4	-19 27.0	94 8.5	26 23.5
4	236 33.6	-10 48.0	210 27.5	263 45.9	-19 25.8	124 12.2	26 23.5
6	266 33.7	-10 46.2	240 32.4	293 44.5	-19 24.5	154 15.8	26 23.4
8	296 33.9	-10 44.4	270 37.3	323 43.0	-19 23.3	184 19.5	26 23.3
10	326 34.0	-10 42.6	300 42.2	353 41.5	-19 22.0	214 23.2	26 23.3
12	356 34.1	-10 40.8	330 47.2	23 40.0	-19 20.8	244 26.8	26 23.2
14	26 34.3	-10 39.0	0 52.1	53 38.5	-19 19.5	274 30.4	26 23.1
16	56 34.4	-10 37.2	30 57.0	83 37.0	-19 18.2	304 34.1	26 23.1
18	86 34.6	-10 35.4	61 1.9	113 35.5	-19 17.0	334 37.7	26 23.0
20	116 34.7	-10 33.6	91 6.9	143 34.1	-19 15.7	4 41.4	26 22.9
22	146 34.9	-10 31.8	121 11.8	173 32.6	-19 14.4	34 45.0	26 22.9
Δ	1	9		-7	6	18	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	358 19.9	130	11 18.1	-145	225 9.6	-22 36.9	352 21.9	11 13.7
2	27 23.9	131	10 49.1	-146	255 13.5	-22 36.8	22 27.2	11 13.8
4	56 28.2	133	10 19.8	-147	285 17.4	-22 36.7	52 32.5	11 14.0
6	85 32.8	134	9 50.5	-147	315 21.3	-22 36.6	82 37.8	11 14.1
8	114 37.7	136	9 21.0	-148	345 25.2	-22 36.5	112 43.1	11 14.3
10	143 42.8	137	8 51.4	-149	15 29.1	-22 36.4	142 48.4	11 14.4
12	172 48.2	138	8 21.7	-149	45 33.0	-22 36.4	172 53.7	11 14.6
14	201 53.9	140	7 51.9	-149	75 36.9	-22 36.3	202 59.0	11 14.8
16	230 59.8	141	7 22.0	-150	105 40.9	-22 36.2	233 4.3	11 14.9
18	260 5.9	142	6 52.0	-150	135 44.8	-22 36.1	263 9.6	11 15.1
20	289 12.3	143	6 22.0	-150	165 48.7	-22 36.0	293 14.9	11 15.2
22	318 18.9	144	5 51.9	-151	195 52.6	-22 35.9	323 20.2	11 15.4
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 23	17 5	0 43	2 20	17 52	3.7	7 27	.0
55	7 11	17 18	0 37	2 1	18 1	3.4	7 15	.3
50	7 1	17 28	0 33	1 48	18 8	3.1	7 6	.6
45	6 53	17 35	0 30	1 38	18 13	2.9	6 58	.8
40	6 46	17 42	0 28	1 30	18 18	2.7	6 52	1.0
35	6 40	17 48	0 26	1 25	18 22	2.6	6 46	1.1
30	6 35	17 53	0 24	1 20	18 25	2.4	6 41	1.2
20	6 26	18 2	0 22	1 14	18 31	2.2	6 33	1.5
10	6 18	18 10	0 21	1 11	18 36	2.0	6 25	1.7
0	6 10	18 17	0 21	1 10	18 41	1.8	6 18	1.8
10	6 3	18 25	0 21	1 11	18 46	1.6	6 11	2.0
20	5 54	18 33	0 23	1 16	18 51	1.4	6 3	2.2
30	5 45	18 42	0 25	1 24	18 57	1.2	5 54	2.5
35	5 39	18 48	0 26	1 30	19 1	1.1	5 49	2.6
40	5 33	18 54	0 28	1 38	19 4	.9	5 43	2.8
45	5 25	19 2	0 31	1 48	19 9	.7	5 36	3.0
50	5 16	19 11	0 34	2 4	19 14	.5	5 28	3.2
55	5 4	19 22	0 39	2 30	19 20	.3	5 17	3.5
60	4 49	19 36	0 47	3 25	19 28	.0	5 4	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 46.6	.3	16.2	$T_{\overline{m}}$	0 7	1.9	57.2	15.6
12	-13 43.1	$T_{\overline{m}_\odot}$ 12 h 13.7 min		Starost 13.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 25	.1	54	-3.8	♃	8 58	.0	75	-1.8
♂	19 41	.2	274	.0	♄	0 30	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 35.0	−10 30.0	151 16.7	203 31.1	−19 13.1	64 48.6	26 22.8
2	206 35.2	−10 28.2	181 21.7	233 29.6	−19 11.9	94 52.2	26 22.7
4	236 35.3	−10 26.3	211 26.6	263 28.2	−19 10.6	124 55.9	26 22.7
6	266 35.5	−10 24.5	241 31.5	293 26.7	−19 9.3	154 59.5	26 22.6
8	296 35.6	−10 22.7	271 36.4	323 25.2	−19 8.0	185 3.1	26 22.5
10	326 35.8	−10 20.9	301 41.4	353 23.8	−19 6.7	215 6.7	26 22.4
12	356 35.9	−10 19.1	331 46.3	23 22.3	−19 5.4	245 10.3	26 22.4
14	26 36.1	−10 17.3	1 51.2	53 20.8	−19 4.1	275 13.9	26 22.3
16	56 36.3	−10 15.4	31 56.2	83 19.4	−19 2.7	305 17.5	26 22.2
18	86 36.4	−10 13.6	62 1.1	113 17.9	−19 1.4	335 21.1	26 22.2
20	116 36.6	−10 11.8	92 6.0	143 16.4	−19 .1	5 24.7	26 22.1
22	146 36.7	−10 10.0	122 10.9	173 15.0	−18 58.8	35 28.3	26 22.0
Δ	1	9		−7	7	18	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	347 25.7	145	5 21.7	−151	225 56.5	−22 35.8	353 25.6	11 15.5
2	16 32.7	146	4 51.6	−151	256 .4	−22 35.7	23 30.9	11 15.7
4	45 39.9	147	4 21.4	−151	286 4.3	−22 35.6	53 36.2	11 15.8
6	74 47.2	148	3 51.2	−151	316 8.2	−22 35.5	83 41.5	11 16.0
8	103 54.8	149	3 21.0	−151	346 12.2	−22 35.4	113 46.8	11 16.2
10	133 2.5	149	2 50.7	−151	16 16.1	−22 35.3	143 52.1	11 16.3
12	162 10.4	150	2 20.5	−151	46 20.0	−22 35.3	173 57.4	11 16.5
14	191 18.4	151	1 50.3	−151	76 23.9	−22 35.2	204 2.7	11 16.6
16	220 26.6	151	1 20.2	−151	106 27.8	−22 35.1	234 8.0	11 16.8
18	249 34.9	152	0 50.0	−150	136 31.8	−22 35.0	264 13.3	11 16.9
20	278 43.3	153	0 20.0	−150	166 35.7	−22 34.9	294 18.6	11 17.1
22	307 51.8	153	− 0 10.1	−150	196 39.6	−22 34.8	324 23.9	11 17.2
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 21	17 8	0 43	2 20	19 21	3.6	7 27	.0
55	7 8	17 20	0 37	2 1	19 22	3.3	7 23	.3
50	6 59	17 29	0 33	1 48	19 22	3.0	7 19	.5
45	6 51	17 37	0 30	1 38	19 23	2.8	7 17	.7
40	6 45	17 43	0 27	1 30	19 23	2.6	7 14	.9
35	6 39	17 49	0 26	1 24	19 23	2.5	7 12	1.0
30	6 34	17 54	0 24	1 20	19 23	2.4	7 11	1.2
20	6 25	18 2	0 22	1 14	19 24	2.1	7 8	1.4
10	6 18	18 10	0 21	1 11	19 24	1.9	7 5	1.6
0	6 10	18 17	0 21	1 10	19 25	1.8	7 2	1.8
10	6 3	18 24	0 21	1 11	19 25	1.6	6 60	2.0
20	5 55	18 32	0 22	1 16	19 25	1.4	6 57	2.2
30	5 45	18 41	0 25	1 23	19 26	1.2	6 53	2.4
35	5 40	18 47	0 26	1 29	19 26	1.0	6 52	2.5
40	5 34	18 53	0 28	1 37	19 26	.9	6 49	2.7
45	5 26	18 60	0 31	1 48	19 27	.7	6 47	2.9
50	5 18	19 9	0 34	2 3	19 27	.5	6 44	3.1
55	5 7	19 19	0 39	2 28	19 27	.3	6 40	3.3
60	4 52	19 33	0 47	3 19	19 28	.0	6 35	3.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−13 39.7	.3	16.2	$T_{\overline{m}}$	0 52	1.8	56.6	15.4
12	−13 36.0	$T_{\overline{m}_\odot}$ 12 h 13.6 min		Starost 14.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 26	.1	52	−3.8	♃	8 55	.0	75	−1.8
♂	19 38	.2	274	.0	♄	0 26	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 36.9	−10 8.2	152 15.9	203 13.5	−18 57.5	65 31.8	26 22.0
2	206 37.1	−10 6.3	182 20.8	233 12.1	−18 56.1	95 35.4	26 21.9
4	236 37.2	−10 4.5	212 25.7	263 10.6	−18 54.8	125 39.0	26 21.8
6	266 37.4	−10 2.7	242 30.7	293 9.2	−18 53.5	155 42.6	26 21.8
8	296 37.6	−10 .8	272 35.6	323 7.7	−18 52.1	185 46.1	26 21.7
10	326 37.7	− 9 59.0	302 40.5	353 6.3	−18 50.8	215 49.7	26 21.6
12	356 37.9	− 9 57.2	332 45.4	23 4.8	−18 49.4	245 53.2	26 21.6
14	26 38.1	− 9 55.4	2 50.4	53 3.4	−18 48.1	275 56.8	26 21.5
16	56 38.2	− 9 53.5	32 55.3	83 1.9	−18 46.7	306 .4	26 21.4
18	86 38.4	− 9 51.7	63 .2	113 .5	−18 45.3	336 3.9	26 21.4
20	116 38.6	− 9 49.9	93 5.2	142 59.1	−18 44.0	6 7.4	26 21.3
22	146 38.8	− 9 48.0	123 10.1	172 57.6	−18 42.6	36 11.0	26 21.2
Δ	1	9		−7	7	18	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	337 .4	154	− 0 40.1	−150	226 43.5	−22 34.7	354 29.2	11 17.4
2	6 9.2	154	− 1 10.0	−149	256 47.4	−22 34.6	24 34.5	11 17.5
4	35 18.0	154	− 1 39.8	−149	286 51.4	−22 34.5	54 39.8	11 17.7
6	64 26.9	155	− 2 9.5	−148	316 55.3	−22 34.4	84 45.2	11 17.9
8	93 35.8	155	− 2 39.2	−148	346 59.2	−22 34.3	114 50.5	11 18.0
10	122 44.8	155	− 3 8.8	−147	17 3.1	−22 34.2	144 55.8	11 18.2
12	151 53.9	156	− 3 38.2	−147	47 7.1	−22 34.2	175 1.1	11 18.3
14	181 3.0	156	− 4 7.6	−146	77 11.0	−22 34.1	205 6.4	11 18.5
16	210 12.2	156	− 4 36.8	−146	107 14.9	−22 34.0	235 11.7	11 18.6
18	239 21.3	156	− 5 5.9	−145	137 18.8	−22 33.9	265 17.0	11 18.8
20	268 30.5	156	− 5 34.9	−144	167 22.8	−22 33.8	295 22.3	11 18.9
22	297 39.7	156	− 6 3.7	−143	197 26.7	−22 33.7	325 27.6	11 19.1
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 18	17 10	0 43	2 19	20 48	3.6	7 27	.0
55	7 6	17 22	0 37	2 1	20 41	3.3	7 30	.3
50	6 57	17 31	0 33	1 48	20 35	3.0	7 32	.5
45	6 49	17 38	0 30	1 38	20 30	2.8	7 34	.7
40	6 43	17 44	0 27	1 30	20 26	2.6	7 36	.9
35	6 38	17 50	0 26	1 24	20 23	2.5	7 37	1.0
30	6 33	17 54	0 24	1 20	20 20	2.3	7 39	1.2
20	6 25	18 3	0 22	1 14	20 15	2.1	7 41	1.4
10	6 17	18 10	0 21	1 11	20 11	1.9	7 43	1.6
0	6 10	18 17	0 21	1 10	20 7	1.7	7 45	1.7
10	6 3	18 24	0 21	1 11	20 3	1.6	7 47	1.9
20	5 55	18 32	0 22	1 15	19 58	1.4	7 49	2.1
30	5 46	18 40	0 25	1 23	19 53	1.2	7 51	2.3
35	5 41	18 46	0 26	1 29	19 51	1.0	7 52	2.5
40	5 35	18 51	0 28	1 37	19 47	.9	7 54	2.6
45	5 28	18 58	0 31	1 47	19 44	.7	7 55	2.8
50	5 19	19 7	0 34	2 3	19 40	.6	7 58	3.0
55	5 9	19 17	0 39	2 27	19 34	.3	8 0	3.3
60	4 55	19 30	0 46	3 14	19 28	.0	8 4	3.6
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−13 32.2	.3	16.2	$T_{\overline{m}}$	1 35	1.7	56.0	15.3
12	−13 28.2	$T_{\overline{m}_\odot}$ 12 h 13.5 min		Starost 15.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 28	.1	51	−3.8	♃	8 52	.0	74	−1.8
♂	19 36	.2	273	.0	♄	0 22	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 38.9	- 9 46.2	153 15.0	202 56.2	-18 41.2	66 14.5	26 21.1
2	206 39.1	- 9 44.4	183 19.9	232 54.8	-18 39.9	96 18.1	26 21.1
4	236 39.3	- 9 42.5	213 24.9	262 53.3	-18 38.5	126 21.6	26 21.0
6	266 39.5	- 9 40.7	243 29.8	292 51.9	-18 37.1	156 25.1	26 20.9
8	296 39.6	- 9 38.8	273 34.7	322 50.5	-18 35.7	186 28.6	26 20.9
10	326 39.8	- 9 37.0	303 39.7	352 49.0	-18 34.3	216 32.2	26 20.8
12	356 40.0	- 9 35.1	333 44.6	22 47.6	-18 32.9	246 35.7	26 20.7
14	26 40.2	- 9 33.3	3 49.5	52 46.2	-18 31.5	276 39.2	26 20.7
16	56 40.4	- 9 31.5	33 54.4	82 44.8	-18 30.1	306 42.7	26 20.6
18	86 40.5	- 9 29.6	63 59.4	112 43.3	-18 28.7	336 46.2	26 20.5
20	116 40.7	- 9 27.8	94 4.3	142 41.9	-18 27.3	6 49.7	26 20.4
22	146 40.9	- 9 25.9	124 9.2	172 40.5	-18 25.9	36 53.2	26 20.4
Δ	1	9		-7	7	18	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	326 48.9	156	- 6 32.4	-143	227 30.6	-22 33.6	355 32.9	11 19.2
2	355 58.1	156	- 7 .9	-142	257 34.6	-22 33.5	25 38.2	11 19.4
4	25 7.3	156	- 7 29.3	-141	287 38.5	-22 33.4	55 43.5	11 19.6
6	54 16.4	156	- 7 57.5	-140	317 42.4	-22 33.3	85 48.8	11 19.7
8	83 25.6	155	- 8 25.5	-139	347 46.4	-22 33.2	115 54.2	11 19.9
10	112 34.6	155	- 8 53.3	-138	17 50.3	-22 33.1	145 59.5	11 20.0
12	141 43.7	155	- 9 21.0	-137	47 54.2	-22 33.0	176 4.8	11 20.2
14	170 52.7	155	- 9 48.5	-136	77 58.2	-22 32.9	206 10.1	11 20.3
16	200 1.6	154	-10 15.7	-135	108 2.1	-22 32.9	236 15.4	11 20.5
18	229 10.5	154	-10 42.8	-134	138 6.0	-22 32.8	266 20.7	11 20.6
20	258 19.2	154	-11 9.6	-133	168 10.0	-22 32.7	296 26.0	11 20.8
22	287 27.9	153	-11 36.3	-132	198 13.9	-22 32.6	326 31.3	11 20.9
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 15	17 13	0 43	2 19	22 15	3.7	7 26	.0
55	7 4	17 24	0 37	2 1	21 59	3.3	7 37	.3
50	6 55	17 33	0 33	1 48	21 47	3.0	7 45	.6
45	6 48	17 40	0 30	1 38	21 37	2.8	7 52	.8
40	6 42	17 45	0 27	1 30	21 29	2.6	7 57	.9
35	6 37	17 51	0 26	1 24	21 22	2.5	8 2	1.1
30	6 32	17 55	0 24	1 20	21 16	2.3	8 6	1.2
20	6 24	18 3	0 22	1 14	21 6	2.1	8 14	1.4
10	6 17	18 10	0 21	1 10	20 57	2.0	8 20	1.6
0	6 10	18 17	0 21	1 10	20 49	1.8	8 27	1.8
10	6 3	18 23	0 21	1 11	20 40	1.6	8 33	1.9
20	5 56	18 31	0 22	1 15	20 31	1.4	8 40	2.1
30	5 47	18 39	0 24	1 23	20 21	1.2	8 47	2.3
35	5 42	18 44	0 26	1 29	20 16	1.1	8 52	2.5
40	5 36	18 50	0 28	1 36	20 9	1.0	8 57	2.6
45	5 29	18 57	0 31	1 47	20 2	.8	9 3	2.8
50	5 21	19 5	0 34	2 2	19 53	.6	9 10	3.0
55	5 11	19 15	0 39	2 25	19 42	.4	9 19	3.3
60	4 57	19 28	0 46	3 10	19 27	.0	9 30	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 24.1	.4	16.2	$T_{\overline{m}}$	2 17	1.8	55.5	15.1
12	-13 19.8	$T_{\overline{m}_\odot}$ 12 h 13.3 min		Starost 16.8 d		Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 29	.1	50	-3.8	♄	8 49	.0	74	-1.8
♂	19 33	.1	273	.0	♇	0 18	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 41.1	- 9 24.1	154 14.2	202 39.1	-18 24.5	66 56.7	26 20.3
2	206 41.3	- 9 22.2	184 19.1	232 37.7	-18 23.0	97 .2	26 20.2
4	236 41.5	- 9 20.4	214 24.0	262 36.3	-18 21.6	127 3.7	26 20.2
6	266 41.7	- 9 18.5	244 28.9	292 34.9	-18 20.2	157 7.1	26 20.1
8	296 41.9	- 9 16.7	274 33.9	322 33.5	-18 18.8	187 10.6	26 20.0
10	326 42.1	- 9 14.8	304 38.8	352 32.0	-18 17.3	217 14.1	26 19.9
12	356 42.2	- 9 13.0	334 43.7	22 30.6	-18 15.9	247 17.6	26 19.9
14	26 42.4	- 9 11.1	4 48.6	52 29.2	-18 14.4	277 21.0	26 19.8
16	56 42.6	- 9 9.3	34 53.6	82 27.8	-18 13.0	307 24.5	26 19.7
18	86 42.8	- 9 7.4	64 58.5	112 26.4	-18 11.5	337 28.0	26 19.6
20	116 43.0	- 9 5.5	95 3.4	142 25.0	-18 10.1	7 31.4	26 19.6
22	146 43.2	- 9 3.7	125 8.4	172 23.6	-18 8.6	37 34.9	26 19.5
Δ	1	9		-7	7	17	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	316 36.5	153	-12 2.7	-131	228 17.8	-22 32.5	356 36.6	11 21.1
2	345 45.1	152	-12 28.9	-130	258 21.8	-22 32.4	26 41.9	11 21.3
4	14 53.5	152	-12 54.8	-129	288 25.7	-22 32.3	56 47.2	11 21.4
6	44 1.8	151	-13 20.5	-127	318 29.7	-22 32.2	86 52.5	11 21.6
8	73 10.0	150	-13 46.0	-126	348 33.6	-22 32.1	116 57.8	11 21.7
10	102 18.0	150	-14 11.2	-125	18 37.5	-22 32.0	147 3.2	11 21.9
12	131 25.9	149	-14 36.1	-123	48 41.5	-22 31.9	177 8.5	11 22.0
14	160 33.7	148	-15 .8	-122	78 45.4	-22 31.8	207 13.8	11 22.2
16	189 41.4	148	-15 25.2	-121	108 49.4	-22 31.7	237 19.1	11 22.3
18	218 48.9	147	-15 49.3	-119	138 53.3	-22 31.6	267 24.4	11 22.5
20	247 56.2	146	-16 13.2	-118	168 57.3	-22 31.6	297 29.7	11 22.6
22	277 3.4	145	-16 36.7	-116	199 1.2	-22 31.5	327 35.0	11 22.8
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 12	17 15	0 42	2 19	23 43	3.8	7 26	.0
55	7 1	17 26	0 37	2 1	23 17	3.3	7 45	.4
50	6 53	17 34	0 33	1 48	22 58	3.0	7 59	.7
45	6 46	17 41	0 30	1 38	22 44	2.8	8 10	.9
40	6 40	17 47	0 27	1 30	22 32	2.6	8 20	1.0
35	6 35	17 51	0 26	1 24	22 21	2.5	8 28	1.2
30	6 31	17 56	0 24	1 20	22 12	2.4	8 35	1.3
20	6 23	18 3	0 22	1 14	21 57	2.2	8 48	1.5
10	6 16	18 10	0 21	1 10	21 44	2.0	8 59	1.7
0	6 10	18 17	0 21	1 10	21 31	1.9	9 9	1.8
10	6 3	18 23	0 21	1 11	21 19	1.7	9 19	2.0
20	5 56	18 30	0 22	1 15	21 6	1.5	9 30	2.1
30	5 48	18 38	0 24	1 23	20 51	1.4	9 43	2.4
35	5 43	18 43	0 26	1 28	20 43	1.2	9 51	2.5
40	5 37	18 49	0 28	1 36	20 33	1.1	9 59	2.6
45	5 31	18 55	0 30	1 46	20 21	1.0	10 9	2.8
50	5 23	19 3	0 34	2 1	20 8	.8	10 21	3.0
55	5 13	19 12	0 39	2 24	19 51	.5	10 37	3.3
60	5 0	19 25	0 46	3 6	19 28	.1	10 57	3.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-13 15.4	.4	16.2	$T_{\overline{m}}$	2 59	1.8	55.0	15.0
12	-13 10.8	$T_{\overline{m}_\odot}$ 12 h 13.2 min		Starost 17.8 d		Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 30	.1	48	-3.8	♄	8 46	.0	74	-1.8
♂	19 30	.1	273	.1	♇	0 14	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 43.4	− 9 1.8	155 13.3	202 22.3	−18 7.2	67 38.3	26 19.4
2	206 43.6	− 9 .0	185 18.2	232 20.9	−18 5.7	97 41.8	26 19.4
4	236 43.8	− 8 58.1	215 23.1	262 19.5	−18 4.2	127 45.2	26 19.3
6	266 44.0	− 8 56.2	245 28.1	292 18.1	−18 2.8	157 48.7	26 19.2
8	296 44.2	− 8 54.4	275 33.0	322 16.7	−18 1.3	187 52.1	26 19.1
10	326 44.4	− 8 52.5	305 37.9	352 15.3	−17 59.8	217 55.5	26 19.1
12	356 44.6	− 8 50.6	335 42.9	22 13.9	−17 58.3	247 59.0	26 19.0
14	26 44.8	− 8 48.8	5 47.8	52 12.5	−17 56.8	278 2.4	26 18.9
16	56 45.0	− 8 46.9	35 52.7	82 11.2	−17 55.3	308 5.8	26 18.8
18	86 45.3	− 8 45.0	65 57.6	112 9.8	−17 53.8	338 9.2	26 18.8
20	116 45.5	− 8 43.2	96 2.6	142 8.4	−17 52.3	8 12.7	26 18.7
22	146 45.7	− 8 41.3	126 7.5	172 7.0	−17 50.8	38 16.1	26 18.6
Δ	1	9		−7	7	17	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	306 10.5	144	−17 .0	−115	229 5.2	−22 31.4	357 40.3	11 23.0
2	335 17.3	143	−17 23.0	−113	259 9.1	−22 31.3	27 45.6	11 23.1
4	4 24.0	142	−17 45.6	−112	289 13.0	−22 31.2	57 50.9	11 23.3
6	33 30.5	142	−18 8.0	−110	319 17.0	−22 31.1	87 56.2	11 23.4
8	62 36.8	141	−18 30.0	−109	349 20.9	−22 31.0	118 1.5	11 23.6
10	91 42.9	140	−18 51.7	−107	19 24.9	−22 30.9	148 6.8	11 23.7
12	120 48.9	139	−19 13.0	−105	49 28.8	−22 30.8	178 12.2	11 23.9
14	149 54.6	138	−19 34.1	−103	79 32.8	−22 30.7	208 17.5	11 24.0
16	179 .1	137	−19 54.8	−102	109 36.8	−22 30.6	238 22.8	11 24.2
18	208 5.4	136	−20 15.1	−100	139 40.7	−22 30.5	268 28.1	11 24.3
20	237 10.5	134	−20 35.1	−98	169 44.7	−22 30.4	298 33.4	11 24.5
22	266 15.4	133	−20 54.7	−96	199 48.6	−22 30.3	328 38.7	11 24.6
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 9	17 18	0 42	2 19	. . . .	.0	7 27	.1
55	6 59	17 28	0 37	2 1	. . . .	.0	7 55	.6
50	6 51	17 36	0 33	1 48	. . . .	.0	8 15	.8
45	6 44	17 42	0 30	1 38	23 50	2.7	8 31	1.0
40	6 39	17 48	0 27	1 30	23 34	2.6	8 45	1.2
35	6 34	17 52	0 26	1 24	23 21	2.5	8 56	1.3
30	6 30	17 56	0 24	1 20	23 9	2.4	9 6	1.4
20	6 23	18 4	0 22	1 14	22 49	2.2	9 23	1.6
10	6 16	18 10	0 21	1 10	22 32	2.1	9 38	1.8
0	6 10	18 16	0 21	1 9	22 16	1.9	9 53	1.9
10	6 3	18 23	0 21	1 11	21 60	1.8	10 7	2.0
20	5 56	18 29	0 22	1 15	21 43	1.7	10 22	2.2
30	5 48	18 37	0 24	1 23	21 24	1.5	10 40	2.4
35	5 44	18 42	0 26	1 28	21 12	1.4	10 50	2.5
40	5 38	18 47	0 28	1 36	20 59	1.3	11 2	2.6
45	5 32	18 53	0 30	1 46	20 44	1.2	11 16	2.8
50	5 24	19 1	0 34	2 0	20 26	1.0	11 33	3.0
55	5 15	19 10	0 38	2 22	20 2	.7	11 55	3.3
60	5 3	19 22	0 45	3 3	19 30	.2	12 26	3.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−13 6.1	.4	16.2	$T_{\overline{m}}$	3 42	1.9	54.6	14.9
12	−13 1.2	$T_{\overline{m}_\odot}$	12 h 13.0 min	Starost 18.8 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 31	.1	47	−3.8	♃	8 43	.0	74	−1.8
♂	19 27	.1	272	.1	♄	0 9	.0	202	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 45.9	− 8 39.4	156 12.4	202 5.7	−17 49.3	68 19.5	26 18.5
2	206 46.1	− 8 37.5	186 17.4	232 4.3	−17 47.8	98 22.9	26 18.5
4	236 46.3	− 8 35.7	216 22.3	262 2.9	−17 46.3	128 26.3	26 18.4
6	266 46.5	− 8 33.8	246 27.2	292 1.6	−17 44.8	158 29.7	26 18.3
8	296 46.7	− 8 31.9	276 32.1	322 .2	−17 43.3	188 33.1	26 18.2
10	326 47.0	− 8 30.1	306 37.1	351 58.8	−17 41.8	218 36.5	26 18.2
12	356 47.2	− 8 28.2	336 42.0	21 57.5	−17 40.2	248 39.9	26 18.1
14	26 47.4	− 8 26.3	6 46.9	51 56.1	−17 38.7	278 43.3	26 18.0
16	56 47.6	− 8 24.4	36 51.9	81 54.7	−17 37.2	308 46.6	26 17.9
18	86 47.8	− 8 22.5	66 56.8	111 53.4	−17 35.6	338 50.0	26 17.9
20	116 48.0	− 8 20.7	97 1.7	141 52.0	−17 34.1	8 53.4	26 17.8
22	146 48.3	− 8 18.8	127 6.6	171 50.7	−17 32.6	38 56.8	26 17.7
Δ	1	9		−7	8	17	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 20.1	132	−21 14.0	−95	229 52.6	−22 30.2	358 44.0	11 24.8
2	324 24.6	131	−21 32.9	−93	259 56.5	−22 30.1	28 49.3	11 24.9
4	353 28.8	130	−21 51.4	−91	290 .5	−22 30.1	58 54.6	11 25.1
6	22 32.8	129	−22 9.6	−89	320 4.4	−22 30.0	88 59.9	11 25.3
8	51 36.6	128	−22 27.3	−87	350 8.4	−22 29.9	119 5.2	11 25.4
10	80 40.2	127	−22 44.7	−85	20 12.3	−22 29.8	149 10.5	11 25.6
12	109 43.5	125	−23 1.6	−83	50 16.3	−22 29.7	179 15.8	11 25.7
14	138 46.6	124	−23 18.2	−81	80 20.3	−22 29.6	209 21.2	11 25.9
16	167 49.5	123	−23 34.3	−79	110 24.2	−22 29.5	239 26.5	11 26.0
18	196 52.1	122	−23 50.0	−77	140 28.2	−22 29.4	269 31.8	11 26.2
20	225 54.5	121	−24 5.3	−74	170 32.2	−22 29.3	299 37.1	11 26.3
22	254 56.7	120	−24 20.2	−72	200 36.1	−22 29.2	329 42.4	11 26.5
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 6	17 21	0 42	2 19	1 14	3.8	7 30	.3
55	6 56	17 30	0 37	2 1	0 36	3.2	8 8	.8
50	6 49	17 38	0 33	1 48	0 10	2.9	8 35	1.1
45	6 43	17 44	0 30	1 38	. . . .	.0	8 56	1.3
40	6 37	17 49	0 27	1 30	. . . .	.0	9 13	1.4
35	6 33	17 53	0 25	1 24	. . . .	.0	9 28	1.5
30	6 29	17 57	0 24	1 20	. . . .	.0	9 40	1.6
20	6 22	18 4	0 22	1 13	23 42	2.2	10 2	1.8
10	6 16	18 10	0 21	1 10	23 22	2.1	10 21	1.9
0	6 10	18 16	0 21	1 9	23 3	2.1	10 38	2.0
10	6 3	18 22	0 21	1 11	22 44	2.0	10 56	2.1
20	5 57	18 29	0 22	1 15	22 23	1.9	11 15	2.2
30	5 49	18 36	0 24	1 22	22 0	1.7	11 37	2.4
35	5 45	18 41	0 26	1 28	21 47	1.7	11 49	2.5
40	5 39	18 46	0 28	1 35	21 31	1.6	12 4	2.6
45	5 33	18 51	0 30	1 45	21 12	1.5	12 22	2.7
50	5 26	18 58	0 34	1 60	20 49	1.3	12 44	2.9
55	5 17	19 7	0 38	2 21	20 19	1.0	13 13	3.2
60	5 5	19 19	0 45	2 59	19 34	.4	13 56	3.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	−12 56.3	.4	16.2	$T_{\overline{m}}$	4 27	2.0	54.3	14.8
12	−12 51.1	$T_{\overline{m}_\odot}$	12 h 12.9 min	Starost 19.8 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 32	.1	46	−3.8	♃	8 39	.0	74	−1.8
♂	19 25	.1	272	.1	♄	0 5	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 48.5	- 8 16.9	157 11.6	201 49.3	-17 31.0	69 .1	26 17.6
2	206 48.7	- 8 15.0	187 16.5	231 48.0	-17 29.5	99 3.5	26 17.6
4	236 48.9	- 8 13.1	217 21.4	261 46.6	-17 27.9	129 6.9	26 17.5
6	266 49.2	- 8 11.2	247 26.4	291 45.3	-17 26.4	159 10.2	26 17.4
8	296 49.4	- 8 9.4	277 31.3	321 43.9	-17 24.8	189 13.6	26 17.3
10	326 49.6	- 8 7.5	307 36.2	351 42.6	-17 23.2	219 16.9	26 17.2
12	356 49.8	- 8 5.6	337 41.1	21 41.3	-17 21.7	249 20.3	26 17.2
14	26 50.1	- 8 3.7	7 46.1	51 39.9	-17 20.1	279 23.6	26 17.1
16	56 50.3	- 8 1.8	37 51.0	81 38.6	-17 18.5	309 27.0	26 17.0
18	86 50.5	- 7 59.9	67 55.9	111 37.3	-17 16.9	339 30.3	26 16.9
20	116 50.7	- 7 58.0	98 .8	141 35.9	-17 15.4	9 33.7	26 16.9
22	146 51.0	- 7 56.1	128 5.8	171 34.6	-17 13.8	39 37.0	26 16.8
Δ	1	9		-7	8	17	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	283 58.6	119	-24 34.6	-70	230 40.1	-22 29.1	359 47.7	11 26.6
2	313 .3	117	-24 48.6	-68	260 44.0	-22 29.0	29 53.0	11 26.8
4	342 1.8	116	-25 2.2	-66	290 48.0	-22 28.9	59 58.3	11 26.9
6	11 3.0	115	-25 15.3	-63	320 52.0	-22 28.8	90 3.6	11 27.1
8	40 4.0	114	-25 27.9	-61	350 55.9	-22 28.7	120 8.9	11 27.2
10	69 4.8	113	-25 40.1	-59	20 59.9	-22 28.6	150 14.2	11 27.4
12	98 5.4	112	-25 51.8	-56	51 3.9	-22 28.6	180 19.5	11 27.5
14	127 5.7	111	-26 3.1	-54	81 7.8	-22 28.5	210 24.8	11 27.7
16	156 5.8	110	-26 13.8	-51	111 11.8	-22 28.4	240 30.1	11 27.8
18	185 5.7	108	-26 24.1	-49	141 15.8	-22 28.3	270 35.4	11 28.0
20	214 5.4	107	-26 33.9	-47	171 19.8	-22 28.2	300 40.8	11 28.1
22	243 4.9	106	-26 43.2	-44	201 23.7	-22 28.1	330 46.1	11 28.3
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 3	17 23	0 42	2 19	2 45	3.7	7 36	.6
55	6 54	17 32	0 37	2 1	1 54	3.0	8 28	1.2
50	6 47	17 39	0 33	1 48	1 21	2.8	9 2	1.5
45	6 41	17 45	0 30	1 38	0 56	2.6	9 27	1.6
40	6 36	17 50	0 27	1 30	0 36	2.5	9 48	1.7
35	6 32	17 54	0 25	1 24	0 20	2.4	10 5	1.8
30	6 28	17 58	0 24	1 20	0 6	2.4	10 19	1.9
20	6 21	18 4	0 22	1 13	. . . .	.0	10 44	1.9
10	6 15	18 10	0 21	1 10	. . . .	.0	11 6	2.0
0	6 9	18 16	0 21	1 9	23 52	2.1	11 26	2.1
10	6 3	18 22	0 21	1 11	23 31	2.1	11 46	2.2
20	5 57	18 28	0 22	1 15	23 8	2.0	12 8	2.2
30	5 50	18 35	0 24	1 22	22 42	2.0	12 33	2.3
35	5 45	18 39	0 26	1 28	22 26	1.9	12 48	2.4
40	5 41	18 44	0 28	1 35	22 9	1.9	13 6	2.4
45	5 35	18 50	0 30	1 45	21 47	1.8	13 27	2.5
50	5 28	18 56	0 34	1 59	21 20	1.7	13 53	2.6
55	5 19	19 5	0 38	2 20	20 43	1.5	14 29	2.8
60	5 8	19 16	0 45	2 56	19 45	1.0	15 26	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 45.9	.5	16.2	$T_{\overline{m}}$ 5 14	2.1	54.2	14.8
12	-12 40.4	$T_{\overline{m}_\odot}$ 12 h 12.7 min		Starost 20.8 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 33	.1	45	-3.8	♃	8 36	.0	73	-1.8
♂	19 22	.1	272	.1	♄	0 1	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 51.2	- 7 54.2	158 10.7	201 33.3	-17 12.2	69 40.3	26 16.7
2	206 51.4	- 7 52.4	188 15.6	231 31.9	-17 10.6	99 43.6	26 16.6
4	236 51.7	- 7 50.5	218 20.6	261 30.6	-17 9.0	129 47.0	26 16.5
6	266 51.9	- 7 48.6	248 25.5	291 29.3	-17 7.4	159 50.3	26 16.5
8	296 52.1	- 7 46.7	278 30.4	321 28.0	-17 5.8	189 53.6	26 16.4
10	326 52.4	- 7 44.8	308 35.3	351 26.6	-17 4.2	219 56.9	26 16.3
12	356 52.6	- 7 42.9	338 40.3	21 25.3	-17 2.6	250 .2	26 16.2
14	26 52.9	- 7 41.0	8 45.2	51 24.0	-17 1.0	280 3.5	26 16.1
16	56 53.1	- 7 39.1	38 50.1	81 22.7	-16 59.4	310 6.8	26 16.1
18	86 53.3	- 7 37.2	68 55.1	111 21.4	-16 57.7	340 10.1	26 16.0
20	116 53.6	- 7 35.3	99 .0	141 20.1	-16 56.1	10 13.4	26 15.9
22	146 53.8	- 7 33.4	129 4.9	171 18.8	-16 54.5	40 16.7	26 15.8
Δ	1	9		-7	8	17	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	272 4.2	105	-26 52.0	-42	231 27.7	-22 28.0	0 51.4	11 28.5
2	301 3.3	104	-27 .3	-39	261 31.7	-22 27.9	30 56.7	11 28.6
4	330 2.2	104	-27 8.1	-36	291 35.6	-22 27.8	61 2.0	11 28.8
6	359 .9	103	-27 15.4	-34	321 39.6	-22 27.7	91 7.3	11 28.9
8	27 59.4	102	-27 22.2	-31	351 43.6	-22 27.6	121 12.6	11 29.1
10	56 57.8	101	-27 28.4	-29	21 47.6	-22 27.5	151 17.9	11 29.2
12	85 56.0	100	-27 34.1	-26	51 51.5	-22 27.4	181 23.2	11 29.4
14	114 54.0	99	-27 39.3	-23	81 55.5	-22 27.3	211 28.5	11 29.5
16	143 51.8	99	-27 44.0	-21	111 59.5	-22 27.2	241 33.8	11 29.7
18	172 49.5	98	-27 48.1	-18	142 3.5	-22 27.1	271 39.1	11 29.8
20	201 47.1	97	-27 51.7	-15	172 7.5	-22 27.0	301 44.4	11 30.0
22	230 44.5	96	-27 54.7	-12	202 11.4	-22 27.0	331 49.7	11 30.1
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 0	17 26	0 42	2 19	4 13	2.9	7 51	1.5
55	6 52	17 34	0 37	2 1	3 7	2.6	8 58	1.9
50	6 45	17 41	0 33	1 48	2 27	2.5	9 38	2.0
45	6 39	17 46	0 30	1 38	1 59	2.4	10 6	2.0
40	6 35	17 51	0 27	1 30	1 37	2.3	10 29	2.1
35	6 30	17 55	0 25	1 24	1 18	2.3	10 48	2.1
30	6 27	17 59	0 24	1 20	1 3	2.3	11 4	2.1
20	6 20	18 5	0 22	1 13	0 36	2.2	11 31	2.1
10	6 15	18 10	0 21	1 10	0 13	2.2	11 55	2.1
0	6 9	18 16	0 21	1 9	. . . .	.0	12 16	2.2
10	6 4	18 21	0 21	1 11	. . . .	.0	12 38	2.2
20	5 58	18 27	0 22	1 15	23 57	2.2	13 2	2.2
30	5 50	18 34	0 24	1 22	23 29	2.2	13 29	2.2
35	5 46	18 38	0 26	1 28	23 13	2.2	13 45	2.2
40	5 42	18 43	0 28	1 35	22 54	2.2	14 4	2.2
45	5 36	18 48	0 30	1 45	22 31	2.2	14 27	2.2
50	5 30	18 54	0 33	1 58	22 1	2.2	14 56	2.3
55	5 21	19 2	0 38	2 19	21 20	2.2	15 37	2.3
60	5 11	19 13	0 44	2 54	20 10	2.2	16 47	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-12 35.0	.5	16.2	$T_{\overline{m}}$ 6 4	2.2	54.3	14.8
12	-12 29.3	$T_{\overline{m}_\odot}$ 12 h 12.5 min		Starost 21.8 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 34	.1	43	-3.8	♃	8 33	.0	73	-1.8
♂	19 19	.1	271	.2	♄	23 52	.0	203	.4

1. MART 2008. SUBOTA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 54.1	- 7 31.5	159 9.8	201 17.4	-16 52.9	70 20.0	26 15.7
2	206 54.3	- 7 29.6	189 14.8	231 16.1	-16 51.2	100 23.3	26 15.6
4	236 54.6	- 7 27.7	219 19.7	261 14.8	-16 49.6	130 26.6	26 15.6
6	266 54.8	- 7 25.8	249 24.6	291 13.5	-16 48.0	160 29.9	26 15.5
8	296 55.0	- 7 23.9	279 29.6	321 12.2	-16 46.3	190 33.2	26 15.4
10	326 55.3	- 7 22.0	309 34.5	351 10.9	-16 44.7	220 36.4	26 15.3
12	356 55.5	- 7 20.1	339 39.4	21 9.6	-16 43.0	250 39.7	26 15.2
14	26 55.8	- 7 18.2	9 44.3	51 8.3	-16 41.4	280 43.0	26 15.1
16	56 56.0	- 7 16.2	39 49.3	81 7.1	-16 39.7	310 46.3	26 15.1
18	86 56.3	- 7 14.3	69 54.2	111 5.8	-16 38.1	340 49.5	26 15.0
20	116 56.5	- 7 12.4	99 59.1	141 4.5	-16 36.4	10 52.8	26 14.9
22	146 56.8	- 7 10.5	130 4.1	171 3.2	-16 34.7	40 56.0	26 14.8
Δ	1	10		-6	8	16	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	259 41.8	96	-27 57.2	-10	232 15.4	-22 26.9	1 55.0	11 30.3
2	288 39.0	95	-27 59.2	-7	262 19.4	-22 26.8	32 .3	11 30.4
4	317 36.0	95	-28 .5	-4	292 23.4	-22 26.7	62 5.7	11 30.6
6	346 33.0	94	-28 1.4	-1	322 27.4	-22 26.6	92 11.0	11 30.7
8	15 29.8	94	-28 1.7	1	352 31.4	-22 26.5	122 16.3	11 30.9
10	44 26.6	93	-28 1.4	4	22 35.3	-22 26.4	152 21.6	11 31.0
12	73 23.3	93	-28 .5	7	52 39.3	-22 26.3	182 26.9	11 31.2
14	102 19.9	93	-27 59.1	10	82 43.3	-22 26.2	212 32.2	11 31.3
16	131 16.5	93	-27 57.2	13	112 47.3	-22 26.1	242 37.5	11 31.5
18	160 13.0	92	-27 54.6	15	142 51.3	-22 26.0	272 42.8	11 31.6
20	189 9.5	92	-27 51.5	18	172 55.3	-22 25.9	302 48.1	11 31.8
22	218 5.9	92	-27 47.8	21	202 59.3	-22 25.8	332 53.4	11 31.9
Δ					20	0	27	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 58	17 28	0 42	2 19	5 23	1.7	8 28	2.9
55	6 49	17 36	0 36	2 1	4 9	2.0	9 43	2.6
50	6 43	17 43	0 32	1 48	3 27	2.0	10 25	2.5
45	6 37	17 48	0 29	1 38	2 57	2.1	10 55	2.4
40	6 33	17 52	0 27	1 30	2 33	2.1	11 18	2.4
35	6 29	17 56	0 25	1 24	2 14	2.1	11 38	2.4
30	6 26	17 59	0 24	1 20	1 57	2.1	11 54	2.3
20	6 20	18 5	0 22	1 13	1 29	2.2	12 22	2.3
10	6 14	18 11	0 21	1 10	1 5	2.2	12 46	2.2
0	6 9	18 16	0 21	1 9	0 43	2.2	13 8	2.2
10	6 4	18 21	0 21	1 11	0 21	2.2	13 31	2.2
20	5 58	18 26	0 22	1 15	. . .	.0	13 55	2.1
30	5 51	18 33	0 24	1 22	. . .	.0	14 22	2.0
35	5 47	18 37	0 26	1 27	. . .	.0	14 39	2.0
40	5 43	18 41	0 28	1 34	23 47	2.5	14 58	2.0
45	5 38	18 46	0 30	1 44	23 24	2.6	15 21	1.9
50	5 31	18 52	0 33	1 58	22 55	2.7	15 51	1.8
55	5 23	18 60	0 38	2 18	22 14	2.9	16 32	1.6
60	5 13	19 10	0 44	2 51	21 3	3.4	17 43	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-12 23.6	.5	16.2	$T_{\overline{m}}$ 6 56	2.2	54.5	14.9
12	-12 17.6	$T_{\overline{m}_\odot}$ 12 h 12.3 min		Starost 22.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 35	.1	42	-3.8	♃	8 30	.0	73	-1.8
♂	19 17	.1	271	.2	♄	23 48	.0	203	.4

2. MART NEDELJA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	176 57.0	- 7 8.6	160 9.0	201 1.9	-16 33.1	70 59.3	26 14.7
2	206 57.3	- 7 6.7	190 13.9	231 .6	-16 31.4	101 2.5	26 14.6
4	236 57.5	- 7 4.8	220 18.8	260 59.3	-16 29.7	131 5.8	26 14.6
6	266 57.8	- 7 2.9	250 23.8	290 58.1	-16 28.0	161 9.0	26 14.5
8	296 58.1	- 7 1.0	280 28.7	320 56.8	-16 26.4	191 12.3	26 14.4
10	326 58.3	- 6 59.0	310 33.6	350 55.5	-16 24.7	221 15.5	26 14.3
12	356 58.6	- 6 57.1	340 38.6	20 54.2	-16 23.0	251 18.7	26 14.2
14	26 58.8	- 6 55.2	10 43.5	50 52.9	-16 21.3	281 22.0	26 14.1
16	56 59.1	- 6 53.3	40 48.4	80 51.7	-16 19.6	311 25.2	26 14.0
18	86 59.3	- 6 51.4	70 53.3	110 50.4	-16 17.9	341 28.4	26 14.0
20	116 59.6	- 6 49.5	100 58.3	140 49.1	-16 16.2	11 31.7	26 13.9
22	146 59.9	- 6 47.5	131 3.2	170 47.9	-16 14.5	41 34.9	26 13.8
Δ	1	10		-6	8	16	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 2.3	92	-27 43.6	24	233 3.3	-22 25.7	2 58.7	11 32.1
2	275 58.7	92	-27 38.8	27	263 7.2	-22 25.6	33 4.0	11 32.2
4	304 55.1	92	-27 33.4	30	293 11.2	-22 25.5	63 9.3	11 32.4
6	333 51.5	92	-27 27.5	33	323 15.2	-22 25.4	93 14.6	11 32.5
8	2 47.9	92	-27 20.9	35	353 19.2	-22 25.3	123 19.9	11 32.7
10	31 44.3	92	-27 13.8	38	23 23.2	-22 25.3	153 25.2	11 32.8
12	60 40.7	92	-27 6.2	41	53 27.2	-22 25.2	183 30.5	11 33.0
14	89 37.2	93	-26 57.9	44	83 31.2	-22 25.1	213 35.8	11 33.1
16	118 33.7	93	-26 49.2	47	113 35.2	-22 25.0	243 41.1	11 33.3
18	147 30.3	93	-26 39.8	50	143 39.2	-22 24.9	273 46.4	11 33.4
20	176 26.9	93	-26 29.9	52	173 43.2	-22 24.8	303 51.7	11 33.6
22	205 23.6	94	-26 19.4	55	203 47.2	-22 24.7	333 57.0	11 33.7
Δ					20	0	27	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 55	17 31	0 42	2 19	6 3	.7	9 38	3.8
55	6 47	17 38	0 36	2 1	4 56	1.3	10 45	3.2
50	6 41	17 44	0 32	1 48	4 16	1.6	11 25	2.9
45	6 36	17 49	0 29	1 38	3 46	1.7	11 53	2.8
40	6 32	17 53	0 27	1 30	3 24	1.8	12 16	2.7
35	6 28	17 57	0 25	1 24	3 5	1.9	12 34	2.6
30	6 25	18 0	0 24	1 20	2 49	2.0	12 50	2.5
20	6 19	18 6	0 22	1 13	2 21	2.0	13 17	2.4
10	6 14	18 11	0 21	1 10	1 58	2.1	13 40	2.3
0	6 9	18 15	0 21	1 9	1 36	2.2	14 1	2.2
10	6 4	18 20	0 21	1 11	1 14	2.3	14 22	2.1
20	5 58	18 26	0 22	1 14	0 50	2.3	14 45	2.0
30	5 52	18 32	0 24	1 22	0 23	2.4	15 12	1.9
35	5 48	18 35	0 26	1 27	0 6	2.5	15 27	1.8
40	5 44	18 40	0 28	1 34	. . .	.0	15 45	1.7
45	5 39	18 44	0 30	1 44	. . .	.0	16 7	1.6
50	5 33	18 50	0 33	1 57	. . .	.0	16 34	1.4
55	5 25	18 57	0 38	2 16	23 24	3.4	17 11	1.1
60	5 16	19 7	0 44	2 49	22 25	4.0	18 10	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-12 11.7	.5	16.2	$T_{\overline{m}}$ 7 48	2.2	55.0	15.0
12	-12 5.5	$T_{\overline{m}_\odot}$ 12 h 12.1 min		Starost 23.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 36	.1	41	-3.8	♃	8 27	.0	73	-1.8
♂	19 14	.1	271	.2	♄	23 44	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 .1	- 6 45.6	161 8.1	200 46.6	-16 12.8	71 38.1	26 13.7
2	207 .4	- 6 43.7	191 13.1	230 45.4	-16 11.1	101 41.3	26 13.6
4	237 .7	- 6 41.8	221 18.0	260 44.1	-16 9.4	131 44.5	26 13.5
6	267 .9	- 6 39.9	251 22.9	290 42.8	-16 7.7	161 47.7	26 13.4
8	297 1.2	- 6 37.9	281 27.8	320 41.6	-16 5.9	191 50.9	26 13.3
10	327 1.5	- 6 36.0	311 32.8	350 40.3	-16 4.2	221 54.1	26 13.3
12	357 1.7	- 6 34.1	341 37.7	20 39.1	-16 2.5	251 57.3	26 13.2
14	27 2.0	- 6 32.2	11 42.6	50 37.8	-16 .8	282 .5	26 13.1
16	57 2.3	- 6 30.3	41 47.5	80 36.6	-15 59.0	312 3.7	26 13.0
18	87 2.5	- 6 28.3	71 52.5	110 35.3	-15 57.3	342 6.9	26 12.9
20	117 2.8	- 6 26.4	101 57.4	140 34.1	-15 55.6	12 10.1	26 12.8
22	147 3.1	- 6 24.5	132 2.3	170 32.8	-15 53.8	42 13.3	26 12.7
Δ	1	10		-6	9	16	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	234 20.3	94	-26 8.3	58	233 51.2	-22 24.6	4 2.4	11 33.9
2	263 17.2	95	-25 56.7	61	263 55.2	-22 24.5	34 7.7	11 34.0
4	292 14.1	95	-25 44.6	64	293 59.2	-22 24.4	64 13.0	11 34.2
6	321 11.1	96	-25 31.9	66	324 3.2	-22 24.3	94 18.3	11 34.3
8	350 8.2	96	-25 18.6	69	354 7.2	-22 24.2	124 23.6	11 34.5
10	19 5.5	97	-25 4.8	72	24 11.2	-22 24.1	154 28.9	11 34.6
12	48 2.8	97	-24 50.5	74	54 15.2	-22 24.0	184 34.2	11 34.8
14	77 .2	98	-24 35.6	77	84 19.2	-22 23.9	214 39.5	11 34.9
16	105 57.8	98	-24 20.2	80	114 23.2	-22 23.8	244 44.8	11 35.1
18	134 55.5	99	-24 4.2	82	144 27.2	-22 23.7	274 50.1	11 35.2
20	163 53.3	100	-23 47.8	85	174 31.2	-22 23.6	304 55.4	11 35.4
22	192 51.3	100	-23 30.8	88	204 35.2	-22 23.6	335 .7	11 35.5
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 52	17 33	0 42	2 20	6 21	.3	11 10	4.1
55	6 44	17 40	0 36	2 1	5 28	.9	12 1	3.5
50	6 39	17 46	0 32	1 48	4 54	1.2	12 35	3.2
45	6 34	17 51	0 29	1 38	4 28	1.4	12 59	3.0
40	6 30	17 54	0 27	1 30	4 7	1.5	13 19	2.8
35	6 27	17 58	0 25	1 24	3 50	1.7	13 36	2.7
30	6 24	18 1	0 24	1 19	3 36	1.8	13 50	2.6
20	6 18	18 6	0 22	1 13	3 10	1.9	14 14	2.4
10	6 13	18 11	0 21	1 10	2 49	2.0	14 34	2.3
0	6 9	18 15	0 21	1 9	2 28	2.2	14 53	2.1
10	6 4	18 20	0 21	1 10	2 8	2.3	15 12	2.0
20	5 59	18 25	0 22	1 14	1 46	2.4	15 33	1.8
30	5 53	18 31	0 24	1 22	1 21	2.6	15 56	1.7
35	5 49	18 34	0 26	1 27	1 6	2.6	16 10	1.5
40	5 45	18 38	0 27	1 34	0 48	2.8	16 25	1.4
45	5 40	18 43	0 30	1 43	0 27	2.9	16 44	1.3
50	5 35	18 48	0 33	1 56	0 1	3.1	17 7	1.0
55	5 28	18 55	0 38	2 15	. . .	.0	17 37	.7
60	5 18	19 4	0 44	2 47	. . .	.0	18 21	.2
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 59.3	.5	16.2	$T_{\overline{m}}$	8 41	2.1	55.5	15.1
12	-11 52.9	$T_{\overline{m}_\odot}$ 12 h 11.9 min		Starost 24.8 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 37	.1	40	-3.8	♃	8 23	.0	73	-1.8
♂	19 11	.1	270	.2	♄	23 40	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 3.3	- 6 22.6	162 7.3	200 31.6	-15 52.1	72 16.5	26 12.6
2	207 3.6	- 6 20.6	192 12.2	230 30.4	-15 50.3	102 19.6	26 12.5
4	237 3.9	- 6 18.7	222 17.1	260 29.1	-15 48.6	132 22.8	26 12.4
6	267 4.2	- 6 16.8	252 22.0	290 27.9	-15 46.8	162 26.0	26 12.3
8	297 4.4	- 6 14.8	282 27.0	320 26.6	-15 45.1	192 29.2	26 12.3
10	327 4.7	- 6 12.9	312 31.9	350 25.4	-15 43.3	222 32.3	26 12.2
12	357 5.0	- 6 11.0	342 36.8	20 24.2	-15 41.5	252 35.5	26 12.1
14	27 5.3	- 6 9.1	12 41.8	50 23.0	-15 39.8	282 38.7	26 12.0
16	57 5.5	- 6 7.1	42 46.7	80 21.7	-15 38.0	312 41.8	26 11.9
18	87 5.8	- 6 5.2	72 51.6	110 20.5	-15 36.2	342 45.0	26 11.8
20	117 6.1	- 6 3.3	102 56.5	140 19.3	-15 34.5	12 48.1	26 11.7
22	147 6.4	- 6 1.3	133 1.5	170 18.1	-15 32.7	42 51.3	26 11.6
Δ	1	10		-6	9	16	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	221 49.4	101	-23 13.3	90	234 39.3	-22 23.5	5 6.0	11 35.7
2	250 47.6	102	-22 55.3	93	264 43.3	-22 23.4	35 11.3	11 35.8
4	279 46.0	103	-22 36.7	95	294 47.3	-22 23.3	65 16.6	11 36.0
6	308 44.6	103	-22 17.7	98	324 51.3	-22 23.2	95 21.9	11 36.1
8	337 43.2	104	-21 58.2	100	354 55.3	-22 23.1	125 27.2	11 36.2
10	6 42.1	105	-21 38.2	102	24 59.3	-22 23.0	155 32.5	11 36.4
12	35 41.0	106	-21 17.7	105	55 3.3	-22 22.9	185 37.8	11 36.5
14	64 40.2	106	-20 56.7	107	85 7.3	-22 22.8	215 43.1	11 36.7
16	93 39.4	107	-20 35.3	109	115 11.4	-22 22.7	245 48.4	11 36.8
18	122 38.9	108	-20 13.4	112	145 15.4	-22 22.6	275 53.7	11 37.0
20	151 38.5	109	-19 51.1	114	175 19.4	-22 22.5	305 59.0	11 37.1
22	180 38.2	109	-19 28.2	116	205 23.4	-22 22.4	336 4.3	11 37.3
Δ					20	0	27	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 49	17 36	0 42	2 20	6 28	.1	12 49	4.2
55	6 42	17 42	0 36	2 1	5 50	.6	13 26	3.6
50	6 37	17 48	0 32	1 48	5 22	.9	13 51	3.3
45	6 32	17 52	0 29	1 38	5 2	1.1	14 11	3.1
40	6 28	17 55	0 27	1 30	4 45	1.3	14 27	2.9
35	6 25	17 59	0 25	1 24	4 30	1.5	14 40	2.8
30	6 22	18 1	0 24	1 19	4 18	1.6	14 52	2.6
20	6 17	18 6	0 22	1 13	3 56	1.8	15 12	2.4
10	6 13	18 11	0 21	1 10	3 38	1.9	15 29	2.2
0	6 8	18 15	0 21	1 9	3 20	2.1	15 44	2.1
10	6 4	18 19	0 21	1 10	3 3	2.2	16 0	1.9
20	5 59	18 24	0 22	1 14	2 44	2.4	16 17	1.7
30	5 53	18 30	0 24	1 21	2 22	2.6	16 36	1.5
35	5 50	18 33	0 26	1 27	2 9	2.7	16 47	1.4
40	5 46	18 37	0 27	1 34	1 54	2.9	16 59	1.2
45	5 42	18 41	0 30	1 43	1 37	3.0	17 14	1.0
50	5 36	18 46	0 33	1 56	1 15	3.3	17 32	.8
55	5 30	18 52	0 37	2 14	0 45	3.6	17 55	.5
60	5 21	19 1	0 44	2 45	0 3	4.2	18 26	.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-11 46.5	.6	16.2	$T_{\overline{m}}$	9 32	2.1	56.2	15.3
12	-11 39.8	$T_{\overline{m}_\odot}$ 12 h 11.7 min		Starost 25.8 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 38	.1	38	-3.8	♃	8 20	.0	73	-1.8
♂	19 9	.1	270	.3	♄	23 35	.0	203	.4

5. MART 2008. SREDA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 6.7	- 5 59.4	163 6.4	200 16.8	-15 30.9	72 54.4	26 11.5
2	207 6.9	- 5 57.5	193 11.3	230 15.6	-15 29.1	102 57.6	26 11.4
4	237 7.2	- 5 55.5	223 16.3	260 14.4	-15 27.3	133 .7	26 11.3
6	267 7.5	- 5 53.6	253 21.2	290 13.2	-15 25.6	163 3.8	26 11.2
8	297 7.8	- 5 51.6	283 26.1	320 12.0	-15 23.8	193 7.0	26 11.1
10	327 8.1	- 5 49.7	313 31.0	350 10.8	-15 22.0	223 10.1	26 11.0
12	357 8.4	- 5 47.8	343 36.0	20 9.6	-15 20.2	253 13.2	26 10.9
14	27 8.6	- 5 45.8	13 40.9	50 8.3	-15 18.4	283 16.4	26 10.8
16	57 8.9	- 5 43.9	43 45.8	80 7.1	-15 16.6	313 19.5	26 10.7
18	87 9.2	- 5 42.0	73 50.8	110 5.9	-15 14.8	343 22.6	26 10.6
20	117 9.5	- 5 40.0	103 55.7	140 4.7	-15 12.9	13 25.7	26 10.6
22	147 9.8	- 5 38.1	134 .6	170 3.5	-15 11.1	43 28.8	26 10.5
Δ	1	10		-6	9	16	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	209 38.1	110	-19 5.0	118	235 27.4	-22 22.3	6 9.6	11 37.4
2	238 38.1	111	-18 41.3	121	265 31.4	-22 22.2	36 14.9	11 37.6
4	267 38.3	112	-18 17.2	123	295 35.5	-22 22.1	66 20.2	11 37.7
6	296 38.6	112	-17 52.7	125	325 39.5	-22 22.0	96 25.5	11 37.9
8	325 39.1	113	-17 27.7	127	355 43.5	-22 21.9	126 30.8	11 38.0
10	354 39.7	114	-17 2.4	129	25 47.5	-22 21.9	156 36.1	11 38.2
12	23 40.5	114	-16 36.6	131	55 51.6	-22 21.8	186 41.4	11 38.3
14	52 41.4	115	-16 10.5	133	85 55.6	-22 21.7	216 46.7	11 38.5
16	81 42.4	116	-15 44.0	134	115 59.6	-22 21.6	246 52.0	11 38.6
18	110 43.6	116	-15 17.1	136	146 3.6	-22 21.5	276 57.3	11 38.7
20	139 44.9	117	-14 49.9	138	176 7.7	-22 21.4	307 2.6	11 38.9
22	168 46.3	118	-14 22.3	140	206 11.7	-22 21.3	337 7.9	11 39.0
Δ					20	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 46	17 38	0 42	2 20	6 31	.1	14 29	4.1
55	6 39	17 44	0 36	2 1	6 4	.5	14 53	3.7
50	6 34	17 49	0 32	1 48	5 45	.8	15 11	3.4
45	6 30	17 53	0 29	1 38	5 29	1.0	15 25	3.1
40	6 27	17 57	0 27	1 30	5 16	1.2	15 37	2.9
35	6 24	17 59	0 25	1 24	5 5	1.3	15 46	2.8
30	6 21	18 2	0 24	1 19	4 55	1.4	15 55	2.6
20	6 17	18 7	0 22	1 13	4 39	1.7	16 9	2.4
10	6 12	18 11	0 21	1 10	4 24	1.8	16 22	2.2
0	6 8	18 15	0 21	1 9	4 10	2.0	16 34	2.0
10	6 4	18 19	0 21	1 10	3 56	2.2	16 45	1.8
20	5 59	18 23	0 22	1 14	3 42	2.4	16 58	1.6
30	5 54	18 28	0 24	1 21	3 25	2.6	17 12	1.4
35	5 51	18 31	0 26	1 26	3 15	2.8	17 20	1.2
40	5 47	18 35	0 27	1 33	3 3	2.9	17 29	1.1
45	5 43	18 39	0 30	1 43	2 50	3.1	17 39	.9
50	5 38	18 44	0 33	1 55	2 33	3.4	17 52	.7
55	5 32	18 50	0 37	2 14	2 12	3.7	18 8	.4
60	5 23	18 58	0 43	2 43	1 43	4.1	18 29	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-11 33.2	.6	16.2	$T_{\overline{m}}$ 10 22	2.0	57.0	15.5
12	-11 26.3	$T_{\overline{m}_\odot}$ 12 h 11.4 min		Starost 26.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 39	.1	37	-3.8	♃	8 17	.0	72	-1.8
♂	19 6	.1	270	.3	♄	23 31	.0	203	.4

6. MART ČETVRTAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 10.1	- 5 36.1	164 5.5	200 2.3	-15 9.3	73 31.9	26 10.4
2	207 10.4	- 5 34.2	194 10.5	230 1.1	-15 7.5	103 35.0	26 10.3
4	237 10.7	- 5 32.3	224 15.4	259 59.9	-15 5.7	133 38.2	26 10.2
6	267 11.0	- 5 30.3	254 20.3	289 58.8	-15 3.8	163 41.3	26 10.1
8	297 11.2	- 5 28.4	284 25.3	319 57.6	-15 2.0	193 44.4	26 10.0
10	327 11.5	- 5 26.4	314 30.2	349 56.4	-15 .2	223 47.5	26 9.9
12	357 11.8	- 5 24.5	344 35.1	19 55.2	-14 58.4	253 50.6	26 9.8
14	27 12.1	- 5 22.5	14 40.0	49 54.0	-14 56.5	283 53.6	26 9.7
16	57 12.4	- 5 20.6	44 45.0	79 52.8	-14 54.7	313 56.7	26 9.6
18	87 12.7	- 5 18.7	74 49.9	109 51.6	-14 52.8	343 59.8	26 9.5
20	117 13.0	- 5 16.7	104 54.8	139 50.5	-14 51.0	14 2.9	26 9.4
22	147 13.3	- 5 14.8	134 59.7	169 49.3	-14 49.1	44 6.0	26 9.3
Δ	1	10		-6	9	15	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	197 47.8	118	-13 54.3	141	236 15.7	-22 21.2	7 13.2	11 39.2
2	226 49.4	119	-13 26.0	143	266 19.7	-22 21.1	37 18.5	11 39.3
4	255 51.2	119	-12 57.4	145	296 23.8	-22 21.0	67 23.8	11 39.5
6	284 53.0	120	-12 28.5	146	326 27.8	-22 20.9	97 29.1	11 39.6
8	313 54.9	120	-11 59.3	148	356 31.8	-22 20.8	127 34.4	11 39.8
10	342 57.0	121	-11 29.7	149	26 35.9	-22 20.7	157 39.7	11 39.9
12	11 59.1	121	-10 59.9	150	56 39.9	-22 20.6	187 45.0	11 40.1
14	41 1.2	121	-10 29.8	152	86 43.9	-22 20.5	217 50.3	11 40.2
16	70 3.5	122	- 9 59.4	153	116 48.0	-22 20.4	247 55.6	11 40.3
18	99 5.8	122	- 9 28.8	154	146 52.0	-22 20.3	278 .9	11 40.5
20	128 8.2	122	- 8 57.9	156	176 56.0	-22 20.3	308 6.2	11 40.6
22	157 10.6	122	- 8 26.8	157	207 .1	-22 20.2	338 11.5	11 40.8
Δ					20	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 43	17 41	0 42	2 20	6 32	.0	16 8	4.1
55	6 37	17 46	0 36	2 1	6 15	.4	16 22	3.7
50	6 32	17 51	0 32	1 48	6 3	.7	16 32	3.4
45	6 29	17 55	0 29	1 38	5 52	.9	16 40	3.2
40	6 25	17 58	0 27	1 30	5 44	1.1	16 47	3.0
35	6 23	18 0	0 25	1 24	5 36	1.2	16 53	2.8
30	6 20	18 3	0 24	1 19	5 30	1.3	16 58	2.7
20	6 16	18 7	0 22	1 13	5 18	1.6	17 7	2.4
10	6 12	18 11	0 21	1 10	5 8	1.8	17 15	2.2
0	6 8	18 14	0 21	1 9	4 59	2.0	17 22	2.0
10	6 4	18 18	0 21	1 10	4 50	2.2	17 29	1.8
20	5 60	18 22	0 22	1 14	4 39	2.4	17 36	1.6
30	5 55	18 27	0 24	1 21	4 28	2.6	17 45	1.3
35	5 52	18 30	0 26	1 26	4 21	2.8	17 50	1.2
40	5 48	18 33	0 27	1 33	4 14	3.0	17 55	1.0
45	5 44	18 37	0 30	1 42	4 5	3.1	18 1	.8
50	5 40	18 42	0 33	1 55	3 54	3.4	18 9	.6
55	5 34	18 47	0 37	2 13	3 40	3.7	18 18	.4
60	5 26	18 55	0 43	2 41	3 22	4.1	18 29	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	-11 19.5	.6	16.1	$T_{\overline{m}}$ 11 10	2.0	57.7	15.7
12	-11 12.4	$T_{\overline{m}_\odot}$ 12 h 11.2 min		Starost 27.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 40	.1	36	-3.8	♃	8 14	.0	72	-1.8
♂	19 4	.1	269	.3	♄	23 27	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 13.6	- 5 12.8	165 4.7	199 48.1	-14 47.3	74 9.1	26 9.2
2	207 13.9	- 5 10.9	195 9.6	229 46.9	-14 45.4	104 12.1	26 9.1
4	237 14.2	- 5 8.9	225 14.5	259 45.8	-14 43.6	134 15.2	26 9.0
6	267 14.5	- 5 7.0	255 19.5	289 44.6	-14 41.7	164 18.3	26 8.8
8	297 14.8	- 5 5.0	285 24.4	319 43.4	-14 39.9	194 21.3	26 8.7
10	327 15.1	- 5 3.1	315 29.3	349 42.3	-14 38.0	224 24.4	26 8.6
12	357 15.4	- 5 1.1	345 34.2	19 41.1	-14 36.1	254 27.5	26 8.5
14	27 15.7	- 4 59.2	15 39.2	49 39.9	-14 34.3	284 30.5	26 8.4
16	57 16.0	- 4 57.2	45 44.1	79 38.8	-14 32.4	314 33.6	26 8.3
18	87 16.3	- 4 55.3	75 49.0	109 37.6	-14 30.5	344 36.6	26 8.2
20	117 16.6	- 4 53.3	105 54.0	139 36.4	-14 28.6	14 39.7	26 8.1
22	147 16.9	- 4 51.4	135 58.9	169 35.3	-14 26.7	44 42.7	26 8.0
Δ	2	10		-6	9	15	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	186 13.1	123	- 7 55.5	158	237 4.1	-22 20.1	8 16.8	11 40.9
2	215 15.6	123	- 7 23.9	159	267 8.2	-22 20.0	38 22.1	11 41.1
4	244 18.1	123	- 6 52.2	160	297 12.2	-22 19.9	68 27.3	11 41.2
6	273 20.7	123	- 6 20.2	161	327 16.2	-22 19.8	98 32.6	11 41.4
8	302 23.2	123	- 5 48.1	162	357 20.3	-22 19.7	128 37.9	11 41.5
10	331 25.8	123	- 5 15.8	162	27 24.3	-22 19.6	158 43.2	11 41.6
12	0 28.4	123	- 4 43.3	163	57 28.4	-22 19.5	188 48.5	11 41.8
14	29 30.9	123	- 4 10.7	164	87 32.4	-22 19.4	218 53.8	11 41.9
16	58 33.5	123	- 3 37.9	164	117 36.5	-22 19.3	248 59.1	11 42.1
18	87 36.0	122	- 3 5.0	165	147 40.5	-22 19.2	279 4.4	11 42.2
20	116 38.5	122	- 2 32.0	166	177 44.5	-22 19.1	309 9.7	11 42.4
22	145 40.9	122	- 1 58.9	166	207 48.6	-22 19.0	339 15.0	11 42.5
Δ					20	0	26	1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 40	17 43	0 42	2 20	6 33	.0	17 46	4.1
55	6 34	17 49	0 36	2 1	6 25	.3	17 50	3.7
50	6 30	17 53	0 32	1 48	6 18	.6	17 53	3.4
45	6 27	17 56	0 29	1 38	6 13	.8	17 56	3.2
40	6 24	17 59	0 27	1 30	6 9	1.0	17 58	3.0
35	6 21	18 1	0 25	1 24	6 5	1.2	18 0	2.8
30	6 19	18 3	0 24	1 19	6 2	1.3	18 2	2.7
20	6 15	18 7	0 22	1 13	5 56	1.6	18 5	2.4
10	6 11	18 11	0 21	1 10	5 51	1.8	18 7	2.2
0	6 8	18 14	0 21	1 9	5 47	2.0	18 9	2.0
10	6 4	18 18	0 21	1 10	5 42	2.2	18 12	1.8
20	6 0	18 22	0 22	1 14	5 37	2.4	18 14	1.6
30	5 55	18 26	0 24	1 21	5 31	2.7	18 16	1.3
35	5 53	18 29	0 25	1 26	5 28	2.8	18 18	1.2
40	5 49	18 32	0 27	1 33	5 24	3.0	18 19	1.0
45	5 46	18 35	0 30	1 42	5 20	3.2	18 21	.8
50	5 41	18 40	0 33	1 54	5 15	3.4	18 23	.6
55	5 36	18 45	0 37	2 12	5 8	3.7	18 26	.3
60	5 29	18 52	0 43	2 40	5 0	4.1	18 29	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-11 5.4	.6	16.1	$T_{\overline{m}}$ 11 58	2.0	58.5	15.9
12	-10 58.1	$T_{\overline{m}_\odot}$ 12 h 11.0 min		Starost 28.8 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 41	.1	35	-3.8	♃	8 11	.0	72	-1.9
♂	19 1	.1	269	.3	♄	23 23	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 17.2	- 4 49.4	166 3.8	199 34.1	-14 24.9	74 45.8	26 7.9
2	207 17.5	- 4 47.5	196 8.7	229 33.0	-14 23.0	104 48.8	26 7.8
4	237 17.8	- 4 45.5	226 13.7	259 31.8	-14 21.1	134 51.9	26 7.7
6	267 18.1	- 4 43.6	256 18.6	289 30.7	-14 19.2	164 54.9	26 7.6
8	297 18.5	- 4 41.6	286 23.5	319 29.5	-14 17.3	194 57.9	26 7.5
10	327 18.8	- 4 39.7	316 28.5	349 28.4	-14 15.4	225 1.0	26 7.4
12	357 19.1	- 4 37.7	346 33.4	19 27.2	-14 13.5	255 4.0	26 7.3
14	27 19.4	- 4 35.7	16 38.3	49 26.1	-14 11.6	285 7.0	26 7.2
16	57 19.7	- 4 33.8	46 43.2	79 25.0	-14 9.7	315 10.0	26 7.0
18	87 20.0	- 4 31.8	76 48.2	109 23.8	-14 7.8	345 13.1	26 6.9
20	117 20.3	- 4 29.9	106 53.1	139 22.7	-14 5.9	15 16.1	26 6.8
22	147 20.6	- 4 27.9	136 58.0	169 21.6	-14 3.9	45 19.1	26 6.7
Δ	2	10		-6	10	15	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	174 43.2	122	- 1 25.7	166	237 52.6	-22 18.9	9 20.3	11 42.6
2	203 45.5	121	- 0 52.5	167	267 56.7	-22 18.8	39 25.6	11 42.8
4	232 47.8	121	- 0 19.1	167	298 .7	-22 18.7	69 30.9	11 42.9
6	261 49.9	120	0 14.3	167	328 4.8	-22 18.7	99 36.2	11 43.1
8	290 52.0	120	0 47.7	167	358 8.8	-22 18.6	129 41.5	11 43.2
10	319 53.9	119	1 21.1	167	28 12.9	-22 18.5	159 46.8	11 43.4
12	348 55.8	119	1 54.6	167	58 17.0	-22 18.4	189 52.1	11 43.5
14	17 57.5	118	2 28.1	167	88 21.0	-22 18.3	219 57.3	11 43.6
16	46 59.1	117	3 1.5	167	118 25.1	-22 18.2	250 2.6	11 43.8
18	76 .6	117	3 35.0	167	148 29.1	-22 18.1	280 7.9	11 43.9
20	105 1.9	116	4 8.4	167	178 33.2	-22 18.0	310 13.2	11 44.1
22	134 3.1	115	4 41.7	166	208 37.2	-22 17.9	340 18.5	11 44.2
Δ					20	0	26	1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 37	17 46	0 42	2 21	6 33	.0	19 25	4.2
55	6 32	17 51	0 36	2 2	6 33	.4	19 20	3.8
50	6 28	17 54	0 32	1 48	6 33	.6	19 16	3.5
45	6 25	17 57	0 29	1 38	6 33	.9	19 13	3.3
40	6 22	17 60	0 27	1 30	6 33	1.0	19 11	3.1
35	6 20	18 2	0 25	1 24	6 33	1.2	19 8	2.9
30	6 18	18 4	0 24	1 19	6 34	1.3	19 6	2.8
20	6 14	18 8	0 22	1 13	6 34	1.6	19 3	2.5
10	6 11	18 11	0 21	1 10	6 34	1.8	19 0	2.3
0	6 7	18 14	0 21	1 9	6 34	2.0	18 57	2.1
10	6 4	18 17	0 21	1 10	6 35	2.2	18 54	1.9
20	6 0	18 21	0 22	1 14	6 35	2.5	18 51	1.6
30	5 56	18 25	0 24	1 21	6 35	2.7	18 48	1.4
35	5 53	18 27	0 25	1 26	6 36	2.9	18 46	1.2
40	5 50	18 30	0 27	1 33	6 36	3.0	18 44	1.1
45	5 47	18 34	0 30	1 42	6 36	3.2	18 41	.9
50	5 43	18 38	0 33	1 54	6 37	3.5	18 38	.7
55	5 38	18 42	0 37	2 11	6 38	3.8	18 34	.4
60	5 31	18 49	0 43	2 38	6 38	4.2	18 29	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	-10 50.9	.6	16.1	$T_{\overline{m}}$ 12 46	2.0	59.1	16.1
12	-10 43.5	$T_{\overline{m}_\odot}$ 12 h 10.7 min		Starost .3 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 42	.1	33	-3.8	♃	8 7	.0	72	-1.9
♂	18 59	.1	269	.3	♄	23 19	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 20.9	- 4 26.0	167 3.0	199 20.4	-14 2.0	75 22.1	26 6.6
2	207 21.3	- 4 24.0	197 7.9	229 19.3	-14 .1	105 25.1	26 6.5
4	237 21.6	- 4 22.1	227 12.8	259 18.2	-13 58.2	135 28.1	26 6.4
6	267 21.9	- 4 20.1	257 17.7	289 17.0	-13 56.3	165 31.1	26 6.3
8	297 22.2	- 4 18.1	287 22.7	319 15.9	-13 54.3	195 34.1	26 6.2
10	327 22.5	- 4 16.2	317 27.6	349 14.8	-13 52.4	225 37.1	26 6.0
12	357 22.8	- 4 14.2	347 32.5	19 13.7	-13 50.5	255 40.1	26 5.9
14	27 23.2	- 4 12.3	17 37.5	49 12.5	-13 48.5	285 43.1	26 5.8
16	57 23.5	- 4 10.3	47 42.4	79 11.4	-13 46.6	315 46.1	26 5.7
18	87 23.8	- 4 8.3	77 47.3	109 10.3	-13 44.7	345 49.1	26 5.6
20	117 24.1	- 4 6.4	107 52.2	139 9.2	-13 42.7	15 52.1	26 5.5
22	147 24.4	- 4 4.4	137 57.2	169 8.1	-13 40.8	45 55.1	26 5.4
Δ	2	10		-6	10	15	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	163 4.1	114	5 15.0	166	238 41.3	-22 17.8	10 23.8	11 44.4
2	192 4.9	113	5 48.2	166	268 45.3	-22 17.7	40 29.1	11 44.5
4	221 5.6	112	6 21.3	165	298 49.4	-22 17.6	70 34.4	11 44.6
6	250 6.0	111	6 54.3	164	328 53.5	-22 17.5	100 39.7	11 44.8
8	279 6.3	110	7 27.2	164	358 57.5	-22 17.4	130 45.0	11 44.9
10	308 6.3	109	7 59.9	163	29 1.6	-22 17.3	160 50.3	11 45.1
12	337 6.1	108	8 32.5	162	59 5.7	-22 17.2	190 55.5	11 45.2
14	6 5.7	107	9 5.0	161	89 9.7	-22 17.2	221 .8	11 45.3
16	35 5.1	106	9 37.2	160	119 13.8	-22 17.1	251 6.1	11 45.5
18	64 4.2	104	10 9.3	159	149 17.9	-22 17.0	281 11.4	11 45.6
20	93 3.1	103	10 41.2	158	179 21.9	-22 16.9	311 16.7	11 45.8
22	122 1.7	102	11 12.8	157	209 26.0	-22 16.8	341 22.0	11 45.9
Δ					20	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 34	17 48	0 41	2 21	6 33	.0	21 7	4.4
55	6 29	17 53	0 36	2 2	6 41	.4	20 52	4.0
50	6 26	17 56	0 32	1 48	6 48	.7	20 41	3.6
45	6 23	17 59	0 29	1 38	6 54	.9	20 32	3.4
40	6 21	18 1	0 27	1 30	6 58	1.1	20 24	3.2
35	6 19	18 3	0 25	1 24	7 2	1.3	20 18	3.0
30	6 17	18 5	0 24	1 19	7 6	1.4	20 13	2.9
20	6 13	18 8	0 22	1 13	7 12	1.7	20 3	2.6
10	6 10	18 11	0 21	1 10	7 18	1.9	19 55	2.4
0	6 7	18 14	0 21	1 9	7 23	2.1	19 47	2.2
10	6 4	18 17	0 21	1 10	7 28	2.3	19 39	2.0
20	6 1	18 20	0 22	1 14	7 34	2.5	19 31	1.8
30	5 57	18 24	0 24	1 21	7 41	2.8	19 21	1.5
35	5 54	18 26	0 25	1 26	7 45	3.0	19 16	1.4
40	5 52	18 29	0 27	1 32	7 49	3.1	19 9	1.2
45	5 48	18 32	0 30	1 41	7 54	3.3	19 2	1.0
50	5 45	18 35	0 33	1 53	8 1	3.6	18 54	.8
55	5 40	18 40	0 37	2 10	8 8	3.9	18 43	.5
60	5 34	18 46	0 43	2 37	8 19	4.4	18 30	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-10 36.0	.6	16.1	$T_{\overline{m}}$	13 35	2.1	59.5	16.2
12	-10 28.4	$T_{\overline{m}_\odot}$ 12 h 10.5 min		Starost 1.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 43	.1	32	-3.8	♃	8 4	.0	72	-1.9
♂	18 57	.1	268	.4	♄	23 14	.0	203	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 24.7	- 4 2.5	168 2.1	199 7.0	-13 38.8	75 58.1	26 5.3
2	207 25.1	- 4 .5	198 7.0	229 5.9	-13 36.9	106 1.0	26 5.1
4	237 25.4	- 3 58.5	228 12.0	259 4.7	-13 34.9	136 4.0	26 5.0
6	267 25.7	- 3 56.6	258 16.9	289 3.6	-13 33.0	166 7.0	26 4.9
8	297 26.0	- 3 54.6	288 21.8	319 2.5	-13 31.0	196 10.0	26 4.8
10	327 26.4	- 3 52.6	318 26.7	349 1.4	-13 29.0	226 12.9	26 4.7
12	357 26.7	- 3 50.7	348 31.7	19 .3	-13 27.1	256 15.9	26 4.6
14	27 27.0	- 3 48.7	18 36.6	48 59.2	-13 25.1	286 18.9	26 4.4
16	57 27.3	- 3 46.8	48 41.5	78 58.1	-13 23.1	316 21.8	26 4.3
18	87 27.7	- 3 44.8	78 46.4	108 57.0	-13 21.2	346 24.8	26 4.2
20	117 28.0	- 3 42.8	108 51.4	138 55.9	-13 19.2	16 27.7	26 4.1
22	147 28.3	- 3 40.9	138 56.3	168 54.9	-13 17.2	46 30.7	26 4.0
Δ	2	10		-6	10	15	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	151 .1	100	11 44.2	156	239 30.1	-22 16.7	11 27.3	11 46.0
2	179 58.1	99	12 15.4	155	269 34.1	-22 16.6	41 32.6	11 46.2
4	208 55.9	97	12 46.3	153	299 38.2	-22 16.5	71 37.9	11 46.3
6	237 53.4	96	13 16.9	152	329 42.3	-22 16.4	101 43.1	11 46.5
8	266 50.6	94	13 47.3	150	359 46.3	-22 16.3	131 48.4	11 46.6
10	295 47.5	93	14 17.3	149	29 50.4	-22 16.2	161 53.7	11 46.7
12	324 44.1	91	14 47.0	147	59 54.5	-22 16.1	191 59.0	11 46.9
14	353 40.4	90	15 16.4	145	89 58.6	-22 16.0	222 4.3	11 47.0
16	22 36.3	88	15 45.4	143	120 2.6	-22 15.9	252 9.6	11 47.2
18	51 32.0	86	16 14.1	141	150 6.7	-22 15.8	282 14.9	11 47.3
20	80 27.2	85	16 42.4	139	180 10.8	-22 15.8	312 20.2	11 47.4
22	109 22.2	83	17 10.2	137	210 14.9	-22 15.7	342 25.4	11 47.6
Δ					20	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 31	17 51	0 41	2 21	6 34	.1	22 53	4.6
55	6 27	17 55	0 36	2 2	6 51	.6	22 27	4.1
50	6 24	17 57	0 32	1 48	7 5	.9	22 8	3.7
45	6 21	17 60	0 29	1 38	7 16	1.1	21 53	3.4
40	6 19	18 2	0 27	1 30	7 25	1.3	21 41	3.2
35	6 17	18 4	0 25	1 24	7 33	1.5	21 30	3.1
30	6 16	18 5	0 24	1 19	7 40	1.6	21 21	2.9
20	6 12	18 8	0 22	1 13	7 53	1.8	21 5	2.7
10	6 10	18 11	0 21	1 10	8 3	2.1	20 52	2.5
0	6 7	18 13	0 21	1 9	8 14	2.2	20 39	2.3
10	6 4	18 16	0 21	1 10	8 24	2.4	20 26	2.1
20	6 1	18 19	0 22	1 14	8 35	2.7	20 13	1.9
30	5 57	18 23	0 24	1 21	8 48	2.9	19 57	1.7
35	5 55	18 25	0 25	1 26	8 56	3.0	19 48	1.6
40	5 53	18 27	0 27	1 32	9 4	3.2	19 38	1.4
45	5 50	18 30	0 30	1 41	9 14	3.4	19 27	1.2
50	5 46	18 33	0 33	1 53	9 27	3.7	19 12	1.0
55	5 42	18 37	0 37	2 10	9 42	4.0	18 54	.7
60	5 36	18 43	0 42	2 35	10 3	4.6	18 31	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	-10 20.8	.6	16.1	$T_{\overline{m}}$	14 26	2.3	59.8	16.3
12	-10 13.0	$T_{\overline{m}_\odot}$ 12 h 10.2 min		Starost 2.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 44	.1	31	-3.8	♃	8 1	.0	71	-1.9
♂	18 54	.1	268	.4	♄	23 10	.0	203	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 28.6	− 3 38.9	169 1.2	198 53.8	−13 15.2	76 33.6	26 3.8
2	207 29.0	− 3 36.9	199 6.2	228 52.7	−13 13.2	106 36.6	26 3.7
4	237 29.3	− 3 35.0	229 11.1	258 51.6	−13 11.3	136 39.5	26 3.6
6	267 29.6	− 3 33.0	259 16.0	288 50.5	−13 9.3	166 42.5	26 3.5
8	297 30.0	− 3 31.0	289 20.9	318 49.4	−13 7.3	196 45.4	26 3.4
10	327 30.3	− 3 29.1	319 25.9	348 48.3	−13 5.3	226 48.4	26 3.2
12	357 30.6	− 3 27.1	349 30.8	18 47.3	−13 3.3	256 51.3	26 3.1
14	27 30.9	− 3 25.1	19 35.7	48 46.2	−13 1.3	286 54.2	26 3.0
16	57 31.3	− 3 23.2	49 40.7	78 45.1	−12 59.3	316 57.2	26 2.9
18	87 31.6	− 3 21.2	79 45.6	108 44.0	−12 57.3	347 .1	26 2.7
20	117 31.9	− 3 19.2	109 50.5	138 43.0	−12 55.3	17 3.0	26 2.6
22	147 32.3	− 3 17.3	139 55.4	168 41.9	−12 53.3	47 5.9	26 2.5
Δ	2	10		−5	10	15	−1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	138 16.8	81	17 37.7	135	240 19.0	−22 15.6	12 30.7	11 47.7
2	167 11.1	80	18 4.8	133	270 23.0	−22 15.5	42 36.0	11 47.9
4	196 5.1	78	18 31.4	131	300 27.1	−22 15.4	72 41.3	11 48.0
6	224 58.6	76	18 57.6	129	330 31.2	−22 15.3	102 46.6	11 48.1
8	253 51.9	74	19 23.3	126	0 35.3	−22 15.2	132 51.9	11 48.3
10	282 44.8	73	19 48.5	124	30 39.4	−22 15.1	162 57.1	11 48.4
12	311 37.3	71	20 13.2	121	60 43.4	−22 15.0	193 2.4	11 48.5
14	340 29.5	69	20 37.4	119	90 47.5	−22 14.9	223 7.7	11 48.7
16	9 21.4	67	21 1.1	116	120 51.6	−22 14.8	253 13.0	11 48.8
18	38 12.9	66	21 24.3	113	150 55.7	−22 14.7	283 18.3	11 49.0
20	67 4.0	64	21 46.9	110	180 59.8	−22 14.6	313 23.6	11 49.1
22	95 54.8	62	22 8.9	107	211 3.9	−22 14.5	343 28.8	11 49.2
Δ					20	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 28	17 53	0 41	2 22	6 36	.2	. . .	.0
55	6 24	17 57	0 36	2 2	7 5	.8	. . .	.0
50	6 22	17 59	0 32	1 48	7 26	1.2	23 36	3.6
45	6 19	18 1	0 29	1 38	7 43	1.4	23 15	3.3
40	6 18	18 3	0 27	1 30	7 57	1.6	22 58	3.2
35	6 16	18 5	0 25	1 24	8 9	1.7	22 44	3.0
30	6 14	18 6	0 24	1 19	8 19	1.9	22 31	2.9
20	6 12	18 9	0 22	1 13	8 37	2.1	22 10	2.8
10	6 9	18 11	0 21	1 10	8 53	2.2	21 52	2.6
0	6 7	18 13	0 21	1 9	9 8	2.4	21 35	2.5
10	6 4	18 16	0 21	1 10	9 23	2.6	21 18	2.3
20	6 1	18 18	0 22	1 14	9 39	2.7	20 59	2.2
30	5 58	18 21	0 24	1 20	9 58	2.9	20 39	2.0
35	5 56	18 23	0 25	1 25	10 9	3.1	20 27	1.9
40	5 54	18 26	0 27	1 32	10 21	3.2	20 13	1.8
45	5 51	18 28	0 29	1 41	10 36	3.4	19 56	1.6
50	5 48	18 31	0 33	1 52	10 55	3.7	19 36	1.4
55	5 44	18 35	0 37	2 9	11 19	4.0	19 10	1.0
60	5 39	18 40	0 42	2 34	11 53	4.7	18 34	.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	−10 5.3	.7	16.1	$T_{\overline{m}}$ 15 21	2.5	59.9	16.3
12	− 9 57.3	$T_{\overline{m}_\odot}$ 12 h 10.0 min		Starost 3.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 45	.1	30	−3.8	♃	7 58	.0	71	−1.9
♂	18 52	.1	268	.4	♄	23 6	.0	203	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 32.6	− 3 15.3	170 .4	198 40.8	−12 51.3	77 8.9	26 2.4
2	207 32.9	− 3 13.3	200 5.3	228 39.7	−12 49.3	107 11.8	26 2.2
4	237 33.3	− 3 11.4	230 10.2	258 38.7	−12 47.2	137 14.7	26 2.1
6	267 33.6	− 3 9.4	260 15.2	288 37.6	−12 45.2	167 17.6	26 2.0
8	297 33.9	− 3 7.4	290 20.1	318 36.6	−12 43.2	197 20.5	26 1.9
10	327 34.3	− 3 5.5	320 25.0	348 35.5	−12 41.2	227 23.4	26 1.7
12	357 34.6	− 3 3.5	350 29.9	18 34.4	−12 39.2	257 26.3	26 1.6
14	27 35.0	− 3 1.5	20 34.9	48 33.4	−12 37.1	287 29.2	26 1.5
16	57 35.3	− 2 59.5	50 39.8	78 32.3	−12 35.1	317 32.2	26 1.4
18	87 35.6	− 2 57.6	80 44.7	108 31.3	−12 33.1	347 35.1	26 1.2
20	117 36.0	− 2 55.6	110 49.7	138 30.2	−12 31.0	17 37.9	26 1.1
22	147 36.3	− 2 53.6	140 54.6	168 29.2	−12 29.0	47 40.8	26 1.0
Δ	2	10		−5	10	15	−1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	124 45.3	61	22 30.4	104	241 8.0	−22 14.4	13 34.1	11 49.4
2	153 35.4	59	22 51.3	101	271 12.1	−22 14.4	43 39.4	11 49.5
4	182 25.2	57	23 11.6	98	301 16.2	−22 14.3	73 44.7	11 49.6
6	211 14.7	56	23 31.3	95	331 20.3	−22 14.2	103 50.0	11 49.8
8	240 3.9	54	23 50.4	92	1 24.3	−22 14.1	133 55.3	11 49.9
10	268 52.7	53	24 8.8	89	31 28.4	−22 14.0	164 .5	11 50.0
12	297 41.3	51	24 26.6	86	61 32.5	−22 13.9	194 5.8	11 50.2
14	326 29.5	50	24 43.7	82	91 36.6	−22 13.8	224 11.1	11 50.3
16	355 17.5	49	25 .2	79	121 40.7	−22 13.7	254 16.4	11 50.5
18	24 5.2	47	25 15.9	76	151 44.8	−22 13.6	284 21.7	11 50.6
20	52 52.7	46	25 31.0	72	181 48.9	−22 13.5	314 26.9	11 50.7
22	81 39.9	45	25 45.4	69	211 53.0	−22 13.4	344 32.2	11 50.9
Δ					20	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 25	17 56	0 41	2 22	6 42	.6	0 47	4.6
55	6 22	17 59	0 36	2 2	7 24	1.3	0 5	3.9
50	6 20	18 1	0 32	1 48	7 54	1.6	. . .	.0
45	6 18	18 2	0 29	1 38	8 16	1.8	. . .	.0
40	6 16	18 4	0 27	1 30	8 35	1.9	. . .	.0
35	6 15	18 5	0 25	1 24	8 50	2.1	23 57	2.9
30	6 13	18 7	0 24	1 19	9 3	2.2	23 42	2.8
20	6 11	18 9	0 22	1 13	9 26	2.3	23 16	2.7
10	6 9	18 11	0 21	1 10	9 47	2.4	22 54	2.6
0	6 6	18 13	0 21	1 9	10 5	2.5	22 34	2.6
10	6 4	18 15	0 21	1 10	10 24	2.6	22 14	2.5
20	6 2	18 17	0 22	1 14	10 45	2.8	21 52	2.4
30	5 59	18 20	0 24	1 20	11 9	2.9	21 27	2.3
35	5 57	18 22	0 25	1 25	11 23	3.0	21 12	2.2
40	5 55	18 24	0 27	1 32	11 39	3.1	20 55	2.2
45	5 52	18 26	0 29	1 40	11 58	3.2	20 34	2.0
50	5 49	18 29	0 32	1 52	12 23	3.4	20 9	1.9
55	5 46	18 32	0 37	2 8	12 56	3.7	19 34	1.6
60	5 41	18 37	0 42	2 33	13 47	4.5	18 42	.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 9 49.4	.7	16.1	$T_{\overline{m}}$ 16 20	2.5	59.8	16.3
12	− 9 41.3	$T_{\overline{m}_\odot}$ 12 h 9.7 min		Starost 4.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 46	.1	29	−3.8	♃	7 54	.0	71	−1.9
♂	18 50	.1	267	.4	♄	23 2	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 36.7	- 2 51.7	170 59.5	198 28.1	-12 27.0	77 43.7	26 .8
2	207 37.0	- 2 49.7	201 4.4	228 27.1	-12 24.9	107 46.6	26 .7
4	237 37.3	- 2 47.7	231 9.4	258 26.0	-12 22.9	137 49.5	26 .6
6	267 37.7	- 2 45.7	261 14.3	288 25.0	-12 20.8	167 52.4	26 .4
8	297 38.0	- 2 43.8	291 19.2	318 23.9	-12 18.8	197 55.3	26 .3
10	327 38.4	- 2 41.8	321 24.2	348 22.9	-12 16.7	227 58.2	26 .2
12	357 38.7	- 2 39.8	351 29.1	18 21.8	-12 14.7	258 1.0	26 .1
14	27 39.0	- 2 37.9	21 34.0	48 20.8	-12 12.6	288 3.9	25 59.9
16	57 39.4	- 2 35.9	51 38.9	78 19.8	-12 10.6	318 6.8	25 59.8
18	87 39.7	- 2 33.9	81 43.9	108 18.7	-12 8.5	348 9.7	25 59.7
20	117 40.1	- 2 31.9	111 48.8	138 17.7	-12 6.5	18 12.5	25 59.5
22	147 40.4	- 2 30.0	141 53.7	168 16.7	-12 4.4	48 15.4	25 59.4
Δ	2	10		-5	10	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	110 26.8	44	25 59.1	65	241 57.1	-22 13.3	14 37.5	11 51.0
2	139 13.5	43	26 12.1	61	272 1.2	-22 13.2	44 42.8	11 51.1
4	168 .1	42	26 24.4	58	302 5.3	-22 13.2	74 48.1	11 51.3
6	196 46.4	41	26 36.0	54	332 9.4	-22 13.1	104 53.3	11 51.4
8	225 32.5	40	26 46.8	50	2 13.5	-22 13.0	134 58.6	11 51.5
10	254 18.5	39	26 56.8	47	32 17.6	-22 12.9	165 3.9	11 51.7
12	283 4.4	39	27 6.2	43	62 21.7	-22 12.8	195 9.2	11 51.8
14	311 50.1	38	27 14.8	39	92 25.9	-22 12.7	225 14.4	11 51.9
16	340 35.7	37	27 22.6	35	122 30.0	-22 12.6	255 19.7	11 52.1
18	9 21.2	37	27 29.7	32	152 34.1	-22 12.5	285 25.0	11 52.2
20	38 6.6	37	27 36.0	28	182 38.2	-22 12.4	315 30.3	11 52.3
22	66 51.9	37	27 41.5	24	212 42.3	-22 12.3	345 35.5	11 52.5
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 22	17 58	0 41	2 22	6 56	1.5	2 37	3.9
55	6 19	18 0	0 36	2 3	7 55	2.0	1 39	3.3
50	6 17	18 2	0 32	1 49	8 32	2.2	1 2	3.1
45	6 16	18 4	0 29	1 38	8 60	2.3	0 36	3.0
40	6 14	18 5	0 27	1 30	9 21	2.4	0 15	2.9
35	6 13	18 6	0 25	1 24	9 40	2.4	.. ..	.0
30	6 12	18 7	0 24	1 20	9 55	2.5	.. ..	.0
20	6 10	18 9	0 22	1 13	10 22	2.5	.. ..	.0
10	6 8	18 11	0 21	1 10	10 45	2.6	23 58	2.6
0	6 6	18 13	0 21	1 9	11 6	2.6	23 36	2.6
10	6 4	18 15	0 21	1 10	11 28	2.6	23 14	2.6
20	6 2	18 17	0 22	1 14	11 51	2.7	22 50	2.6
30	5 59	18 19	0 24	1 20	12 18	2.7	22 22	2.6
35	5 58	18 21	0 25	1 25	12 34	2.7	22 6	2.6
40	5 56	18 22	0 27	1 32	12 53	2.8	21 46	2.6
45	5 54	18 24	0 29	1 40	13 16	2.8	21 23	2.6
50	5 51	18 27	0 32	1 52	13 45	2.8	20 54	2.5
55	5 48	18 30	0 36	2 8	14 25	2.9	20 13	2.5
60	5 44	18 34	0 42	2 32	15 34	3.2	19 3	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 33.2	.7	16.1	$T_{\overline{m}}$	17 21	2.6	59.5	16.2
12	- 9 25.0	$T_{\overline{m}_\odot}$	12 h 9.4 min	Starost	5.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 46	.1	27	-3.8	♃	7 51	.0	71	-1.9
♂	18 47	.1	267	.5	♄	22 57	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 40.8	- 2 28.0	171 58.6	198 15.6	-12 2.3	78 18.3	25 59.2
2	207 41.1	- 2 26.0	202 3.6	228 14.6	-12 .3	108 21.1	25 59.1
4	237 41.5	- 2 24.0	232 8.5	258 13.6	-11 58.2	138 24.0	25 59.0
6	267 41.8	- 2 22.1	262 13.4	288 12.6	-11 56.1	168 26.9	25 58.8
8	297 42.2	- 2 20.1	292 18.4	318 11.5	-11 54.0	198 29.7	25 58.7
10	327 42.5	- 2 18.1	322 23.3	348 10.5	-11 52.0	228 32.6	25 58.6
12	357 42.9	- 2 16.1	352 28.2	18 9.5	-11 49.9	258 35.4	25 58.4
14	27 43.2	- 2 14.2	22 33.1	48 8.5	-11 47.8	288 38.3	25 58.3
16	57 43.6	- 2 12.2	52 38.1	78 7.5	-11 45.7	318 41.1	25 58.1
18	87 43.9	- 2 10.2	82 43.0	108 6.4	-11 43.6	348 44.0	25 58.0
20	117 44.3	- 2 8.3	112 47.9	138 5.4	-11 41.5	18 46.8	25 57.9
22	147 44.6	- 2 6.3	142 52.9	168 4.4	-11 39.5	48 49.6	25 57.7
Δ	2	10		-5	10	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	95 37.3	37	27 46.3	20	242 46.4	-22 12.2	15 40.8	11 52.6
2	124 22.6	37	27 50.3	16	272 50.5	-22 12.1	45 46.1	11 52.7
4	153 7.9	37	27 53.6	12	302 54.6	-22 12.1	75 51.4	11 52.9
6	181 53.2	37	27 56.1	9	332 58.7	-22 12.0	105 56.6	11 53.0
8	210 38.6	37	27 57.8	5	3 2.9	-22 11.9	136 1.9	11 53.1
10	239 24.0	37	27 58.8	1	33 7.0	-22 11.8	166 7.2	11 53.3
12	268 9.5	38	27 59.0	-3	63 11.1	-22 11.7	196 12.5	11 53.4
14	296 55.1	39	27 58.4	-7	93 15.2	-22 11.6	226 17.7	11 53.5
16	325 40.8	39	27 57.1	-10	123 19.3	-22 11.5	256 23.0	11 53.7
18	354 26.6	40	27 55.0	-14	153 23.4	-22 11.4	286 28.3	11 53.8
20	23 12.6	41	27 52.2	-18	183 27.6	-22 11.3	316 33.6	11 53.9
22	51 58.7	42	27 48.7	-21	213 31.7	-22 11.2	346 38.8	11 54.1
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 19	18 1	0 41	2 23	7 32	3.2	4 11	2.2
55	6 17	18 2	0 36	2 3	8 44	2.9	2 59	2.4
50	6 15	18 4	0 32	1 49	9 25	2.8	2 18	2.5
45	6 14	18 5	0 29	1 38	9 55	2.8	1 48	2.5
40	6 13	18 6	0 27	1 30	10 18	2.7	1 25	2.5
35	6 12	18 7	0 25	1 24	10 37	2.7	1 6	2.6
30	6 11	18 8	0 24	1 20	10 54	2.7	0 50	2.6
20	6 9	18 9	0 22	1 13	11 22	2.6	0 22	2.6
10	6 7	18 11	0 21	1 10	11 46	2.6	.. ..	.0
0	6 6	18 12	0 21	1 9	12 8	2.5	.. ..	.0
10	6 4	18 14	0 21	1 10	12 31	2.5	.. ..	.0
20	6 2	18 16	0 22	1 13	12 55	2.5	23 52	2.6
30	5 60	18 18	0 24	1 20	13 23	2.4	23 24	2.7
35	5 59	18 19	0 25	1 25	13 40	2.4	23 7	2.8
40	5 57	18 21	0 27	1 31	13 59	2.3	22 48	2.9
45	5 55	18 22	0 29	1 40	14 23	2.2	22 25	3.0
50	5 53	18 25	0 32	1 51	14 53	2.1	21 55	3.1
55	5 50	18 27	0 36	2 7	15 35	1.9	21 13	3.3
60	5 46	18 31	0 42	2 30	16 50	1.4	19 58	3.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 9 16.7	.7	16.1	$T_{\overline{m}}$	18 23	2.5	59.2	16.1
12	- 9 8.4	$T_{\overline{m}_\odot}$	12 h 9.1 min	Starost	6.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 47	.1	26	-3.8	♃	7 48	.0	71	-1.9
♂	18 45	.1	266	.5	♄	22 53	.0	204	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 45.0	- 2 4.3	172 57.8	198 3.4	-11 37.4	78 52.5	25 57.6
2	207 45.3	- 2 2.3	203 2.7	228 2.4	-11 35.3	108 55.3	25 57.4
4	237 45.7	- 2 .4	233 7.6	258 1.4	-11 33.2	138 58.1	25 57.3
6	267 46.0	- 1 58.4	263 12.6	288 .4	-11 31.1	169 1.0	25 57.2
8	297 46.4	- 1 56.4	293 17.5	317 59.4	-11 29.0	199 3.8	25 57.0
10	327 46.7	- 1 54.4	323 22.4	347 58.4	-11 26.9	229 6.6	25 56.9
12	357 47.1	- 1 52.5	353 27.4	17 57.4	-11 24.8	259 9.5	25 56.7
14	27 47.4	- 1 50.5	23 32.3	47 56.4	-11 22.6	289 12.3	25 56.6
16	57 47.8	- 1 48.5	53 37.2	77 55.4	-11 20.5	319 15.1	25 56.4
18	87 48.1	- 1 46.5	83 42.1	107 54.4	-11 18.4	349 17.9	25 56.3
20	117 48.5	- 1 44.5	113 47.1	137 53.4	-11 16.3	19 20.7	25 56.2
22	147 48.8	- 1 42.6	143 52.0	167 52.4	-11 14.2	49 23.5	25 56.0
Δ	2	10		-5	11	14	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 45.1	43	27 44.4	-25	243 35.8	-22 11.1	16 44.1	11 54.2
2	109 31.6	44	27 39.3	-29	273 39.9	-22 11.0	46 49.4	11 54.3
4	138 18.4	45	27 33.6	-32	303 44.1	-22 11.0	76 54.6	11 54.5
6	167 5.4	46	27 27.1	-36	333 48.2	-22 10.9	106 59.9	11 54.6
8	195 52.6	48	27 19.9	-39	3 52.3	-22 10.8	137 5.2	11 54.7
10	224 40.2	49	27 12.0	-43	33 56.4	-22 10.7	167 10.4	11 54.8
12	253 28.0	51	27 3.4	-46	64 .6	-22 10.6	197 15.7	11 55.0
14	282 16.1	52	26 54.2	-50	94 4.7	-22 10.5	227 21.0	11 55.1
16	311 4.5	54	26 44.2	-53	124 8.8	-22 10.4	257 26.3	11 55.2
18	339 53.2	55	26 33.6	-56	154 13.0	-22 10.3	287 31.5	11 55.4
20	8 42.3	57	26 22.3	-60	184 17.1	-22 10.2	317 36.8	11 55.5
22	37 31.7	59	26 10.4	-63	214 21.2	-22 10.1	347 42.1	11 55.6
Δ					21	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 16	18 3	0 41	2 23	8 48	4.2	5 4	.9
55	6 14	18 4	0 36	2 3	9 54	3.5	3 58	1.6
50	6 13	18 6	0 32	1 49	10 33	3.3	3 18	1.8
45	6 12	18 6	0 29	1 38	11 2	3.1	2 49	2.0
40	6 11	18 7	0 27	1 30	11 24	3.0	2 26	2.1
35	6 10	18 8	0 25	1 24	11 42	2.9	2 7	2.2
30	6 10	18 9	0 24	1 20	11 58	2.8	1 51	2.2
20	6 8	18 10	0 22	1 13	12 25	2.6	1 24	2.3
10	6 7	18 11	0 21	1 10	12 48	2.5	1 0	2.4
0	6 6	18 12	0 21	1 9	13 10	2.4	0 38	2.5
10	6 4	18 13	0 21	1 10	13 31	2.3	0 16	2.6
20	6 3	18 15	0 22	1 13	13 54	2.2	. . .	.0
30	6 1	18 17	0 24	1 20	14 21	2.0	. . .	.0
35	5 59	18 18	0 25	1 25	14 36	2.0	. . .	.0
40	5 58	18 19	0 27	1 31	14 54	1.8	23 57	3.0
45	5 56	18 21	0 29	1 40	15 16	1.7	23 36	3.2
50	5 54	18 22	0 32	1 51	15 44	1.5	23 9	3.4
55	5 52	18 25	0 36	2 6	16 22	1.2	22 32	3.7
60	5 49	18 28	0 42	2 29	17 22	.5	21 32	4.4
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 9 .0	.7	16.1	$T_{\overline{m}}$ 19 24	2.4	58.8	16.0
12	- 8 51.5	$T_{\overline{m}_\odot}$ 12 h 8.9 min		Starost 7.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 48	.1	25	-3.8	♃	7 45	.0	71	-1.9
♂	18 43	.1	266	.5	♄	22 49	.0	204	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 49.2	- 1 40.6	173 56.9	197 51.4	-11 12.1	79 26.4	25 55.9
2	207 49.6	- 1 38.6	204 1.9	227 50.4	-11 10.0	109 29.2	25 55.7
4	237 49.9	- 1 36.6	234 6.8	257 49.4	-11 7.8	139 32.0	25 55.6
6	267 50.3	- 1 34.7	264 11.7	287 48.5	-11 5.7	169 34.8	25 55.4
8	297 50.6	- 1 32.7	294 16.6	317 47.5	-11 3.6	199 37.6	25 55.3
10	327 51.0	- 1 30.7	324 21.6	347 46.5	-11 1.5	229 40.4	25 55.1
12	357 51.3	- 1 28.7	354 26.5	17 45.5	-10 59.3	259 43.2	25 55.0
14	27 51.7	- 1 26.8	24 31.4	47 44.5	-10 57.2	289 46.0	25 54.8
16	57 52.1	- 1 24.8	54 36.4	77 43.5	-10 55.1	319 48.8	25 54.7
18	87 52.4	- 1 22.8	84 41.3	107 42.6	-10 52.9	349 51.6	25 54.5
20	117 52.8	- 1 20.8	114 46.2	137 41.6	-10 50.8	19 54.4	25 54.4
22	147 53.1	- 1 18.9	144 51.1	167 40.6	-10 48.6	49 57.2	25 54.2
Δ	2	10		-5	11	14	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	66 21.5	61	25 57.8	-66	244 25.4	-22 10.0	17 47.3	11 55.8
2	95 11.6	63	25 44.6	-69	274 29.5	-22 10.0	47 52.6	11 55.9
4	124 2.1	64	25 30.8	-72	304 33.6	-22 9.9	77 57.9	11 56.0
6	152 53.0	66	25 16.4	-75	334 37.8	-22 9.8	108 3.1	11 56.1
8	181 44.3	68	25 1.4	-78	4 41.9	-22 9.7	138 8.4	11 56.3
10	210 36.0	70	24 45.8	-81	34 46.0	-22 9.6	168 13.7	11 56.4
12	239 28.0	72	24 29.6	-84	64 50.2	-22 9.5	198 18.9	11 56.5
14	268 20.5	74	24 12.9	-86	94 54.3	-22 9.4	228 24.2	11 56.7
16	297 13.4	76	23 55.6	-89	124 58.5	-22 9.3	258 29.5	11 56.8
18	326 6.7	79	23 37.8	-92	155 2.6	-22 9.2	288 34.7	11 56.9
20	355 .4	81	23 19.5	-94	185 6.7	-22 9.1	318 40.0	11 57.0
22	23 54.5	83	23 .6	-97	215 10.9	-22 9.1	348 45.2	11 57.2
Δ					21	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 13	18 6	0 42	2 24	10 30	4.4	5 26	.4
55	6 12	18 6	0 36	2 3	11 19	3.7	4 35	1.0
50	6 11	18 7	0 32	1 49	11 51	3.4	4 1	1.3
45	6 10	18 8	0 29	1 38	12 15	3.2	3 36	1.5
40	6 10	18 8	0 27	1 31	12 35	3.0	3 16	1.7
35	6 9	18 9	0 25	1 24	12 51	2.9	2 59	1.8
30	6 8	18 9	0 24	1 20	13 5	2.7	2 45	1.9
20	6 7	18 10	0 22	1 13	13 28	2.5	2 20	2.1
10	6 6	18 11	0 21	1 10	13 49	2.4	1 58	2.2
0	6 5	18 12	0 21	1 9	14 8	2.2	1 38	2.3
10	6 4	18 13	0 21	1 10	14 26	2.1	1 17	2.5
20	6 3	18 14	0 22	1 13	14 47	1.9	0 55	2.6
30	6 1	18 16	0 24	1 20	15 10	1.7	0 30	2.8
35	6 0	18 16	0 25	1 25	15 23	1.6	0 15	2.9
40	5 59	18 17	0 27	1 31	15 39	1.5	. . .	.0
45	5 58	18 19	0 29	1 39	15 57	1.3	. . .	.0
50	5 56	18 20	0 32	1 51	16 20	1.1	. . .	.0
55	5 54	18 22	0 36	2 6	16 50	.7	. . .	.0
60	5 51	18 25	0 42	2 28	17 34	.2	23 18	4.3
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 8 43.0	.7	16.1	$T_{\overline{m}}$ 20 21	2.2	58.3	15.9
12	- 8 34.4	$T_{\overline{m}_\odot}$ 12 h 8.6 min		Starost 8.3 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 49	.1	24	-3.8	♃	7 41	.0	70	-1.9
♂	18 41	.1	265	.5	♄	22 45	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 53.5	- 1 16.9	174 56.1	197 39.6	-10 46.5	79 59.9	25 54.1
2	207 53.9	- 1 14.9	205 1.0	227 38.7	-10 44.3	110 2.7	25 53.9
4	237 54.2	- 1 12.9	235 5.9	257 37.7	-10 42.2	140 5.5	25 53.8
6	267 54.6	- 1 11.0	265 10.9	287 36.7	-10 40.1	170 8.3	25 53.6
8	297 55.0	- 1 9.0	295 15.8	317 35.8	-10 37.9	200 11.1	25 53.5
10	327 55.3	- 1 7.0	325 20.7	347 34.8	-10 35.7	230 13.8	25 53.3
12	357 55.7	- 1 5.0	355 25.6	17 33.8	-10 33.6	260 16.6	25 53.1
14	27 56.0	- 1 3.0	25 30.6	47 32.9	-10 31.4	290 19.4	25 53.0
16	57 56.4	- 1 1.1	55 35.5	77 31.9	-10 29.3	320 22.2	25 52.8
18	87 56.8	- 0 59.1	85 40.4	107 31.0	-10 27.1	350 24.9	25 52.7
20	117 57.1	- 0 57.1	115 45.3	137 30.0	-10 24.9	20 27.7	25 52.5
22	147 57.5	- 0 55.1	145 50.3	167 29.0	-10 22.8	50 30.5	25 52.4
Δ	2	10		-5	11	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	52 49.1	85	22 41.3	-99	245 15.0	-22 9.0	18 50.5	11 57.3
2	81 44.0	87	22 21.5	-101	275 19.2	-22 8.9	48 55.8	11 57.4
4	110 39.4	89	22 1.2	-104	305 23.3	-22 8.8	79 1.0	11 57.5
6	139 35.2	91	21 40.4	-106	335 27.5	-22 8.7	109 6.3	11 57.7
8	168 31.5	93	21 19.2	-108	5 31.6	-22 8.6	139 11.6	11 57.8
10	197 28.1	95	20 57.6	-110	35 35.8	-22 8.5	169 16.8	11 57.9
12	226 25.1	97	20 35.5	-112	65 39.9	-22 8.4	199 22.1	11 58.0
14	255 22.6	99	20 13.0	-114	95 44.1	-22 8.3	229 27.3	11 58.2
16	284 20.5	101	19 50.2	-116	125 48.2	-22 8.3	259 32.6	11 58.3
18	313 18.8	103	19 26.9	-118	155 52.4	-22 8.2	289 37.9	11 58.4
20	342 17.5	105	19 3.3	-120	185 56.5	-22 8.1	319 43.1	11 58.6
22	11 16.5	107	18 39.3	-122	216 .7	-22 8.0	349 48.4	11 58.7
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 10	18 8	0 42	2 25	12 14	4.2	5 34	.1
55	6 9	18 8	0 36	2 4	12 49	3.7	4 58	.6
50	6 9	18 9	0 32	1 49	13 13	3.3	4 32	.9
45	6 8	18 9	0 29	1 39	13 31	3.1	4 12	1.2
40	6 8	18 9	0 27	1 31	13 47	2.9	3 56	1.3
35	6 8	18 10	0 25	1 24	13 59	2.8	3 42	1.5
30	6 7	18 10	0 24	1 20	14 11	2.6	3 30	1.6
20	6 7	18 10	0 22	1 13	14 29	2.4	3 9	1.8
10	6 6	18 11	0 21	1 10	14 46	2.2	2 51	2.0
0	6 5	18 12	0 21	1 9	15 1	2.1	2 34	2.1
10	6 4	18 12	0 21	1 10	15 16	1.9	2 16	2.3
20	6 3	18 13	0 22	1 13	15 33	1.7	1 58	2.5
30	6 2	18 14	0 24	1 20	15 51	1.5	1 36	2.7
35	6 1	18 15	0 25	1 25	16 2	1.4	1 24	2.8
40	6 0	18 16	0 27	1 31	16 14	1.2	1 9	3.0
45	5 59	18 17	0 29	1 39	16 29	1.0	0 52	3.2
50	5 58	18 18	0 32	1 50	16 46	.8	0 30	3.4
55	5 56	18 20	0 36	2 5	17 8	.5	0 1	3.7
60	5 53	18 22	0 42	2 28	17 39	.1	. . ..	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 25.8	.7	16.1	$T_{\overline{m}}$	21 13	2.0	57.9	15.8
12	- 8 17.1	$T_{\overline{m}_\odot}$	12 h 8.3 min	Starost	9.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 50	.1	23	-3.8	♃	7 38	.0	70	-1.9
♂	18 38	.1	265	.5	♄	22 41	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	177 57.9	- 0 53.2	175 55.2	197 28.1	-10 20.6	80 33.2	25 52.2
2	207 58.2	- 0 51.2	206 .1	227 27.1	-10 18.4	110 36.0	25 52.0
4	237 58.6	- 0 49.2	236 5.1	257 26.2	-10 16.3	140 38.7	25 51.9
6	267 59.0	- 0 47.2	266 10.0	287 25.2	-10 14.1	170 41.5	25 51.7
8	297 59.3	- 0 45.3	296 14.9	317 24.3	-10 11.9	200 44.2	25 51.6
10	327 59.7	- 0 43.3	326 19.8	347 23.3	-10 9.8	230 47.0	25 51.4
12	358 .1	- 0 41.3	356 24.8	17 22.4	-10 7.6	260 49.7	25 51.2
14	28 .4	- 0 39.3	26 29.7	47 21.4	-10 5.4	290 52.5	25 51.1
16	58 .8	- 0 37.4	56 34.6	77 20.5	-10 3.2	320 55.2	25 50.9
18	88 1.2	- 0 35.4	86 39.6	107 19.6	-10 1.0	350 58.0	25 50.8
20	118 1.5	- 0 33.4	116 44.5	137 18.6	- 9 58.8	21 .7	25 50.6
22	148 1.9	- 0 31.4	146 49.4	167 17.7	- 9 56.7	51 3.5	25 50.4
Δ	2	10		-5	11	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	40 16.0	109	18 14.9	-123	246 4.8	-22 7.9	19 53.6	11 58.8
2	69 15.9	111	17 50.3	-125	276 9.0	-22 7.8	49 58.9	11 58.9
4	98 16.1	113	17 25.3	-127	306 13.2	-22 7.7	80 4.2	11 59.1
6	127 16.8	115	17 .0	-128	336 17.3	-22 7.6	110 9.4	11 59.2
8	156 17.8	117	16 34.3	-130	6 21.5	-22 7.5	140 14.7	11 59.3
10	185 19.1	119	16 8.4	-131	36 25.6	-22 7.5	170 19.9	11 59.4
12	214 20.8	120	15 42.2	-132	66 29.8	-22 7.4	200 25.2	11 59.6
14	243 22.9	122	15 15.8	-134	96 34.0	-22 7.3	230 30.5	11 59.7
16	272 25.3	124	14 49.1	-135	126 38.1	-22 7.2	260 35.7	11 59.8
18	301 28.0	125	14 22.1	-136	156 42.3	-22 7.1	290 41.0	11 59.9
20	330 31.1	127	13 54.9	-137	186 46.5	-22 7.0	320 46.2	12 .0
22	359 34.5	129	13 27.5	-138	216 50.6	-22 6.9	350 51.5	12 .2
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 7	18 11	0 42	2 25	13 54	3.9	5 38	.1
55	6 7	18 10	0 36	2 4	14 17	3.5	5 13	.4
50	6 7	18 10	0 32	1 50	14 33	3.2	4 55	.7
45	6 6	18 10	0 29	1 39	14 46	3.0	4 40	.9
40	6 6	18 10	0 27	1 31	14 57	2.8	4 28	1.1
35	6 6	18 10	0 25	1 25	15 6	2.7	4 17	1.3
30	6 6	18 10	0 24	1 20	15 14	2.5	4 8	1.4
20	6 6	18 11	0 22	1 13	15 28	2.3	3 52	1.6
10	6 5	18 11	0 21	1 10	15 39	2.1	3 38	1.8
0	6 5	18 11	0 21	1 9	15 51	1.9	3 25	2.0
10	6 4	18 12	0 21	1 10	16 2	1.7	3 12	2.2
20	6 3	18 12	0 22	1 13	16 13	1.5	2 58	2.4
30	6 2	18 13	0 24	1 20	16 27	1.3	2 41	2.6
35	6 2	18 14	0 25	1 25	16 34	1.2	2 32	2.7
40	6 1	18 14	0 27	1 31	16 43	1.0	2 21	2.9
45	6 0	18 15	0 29	1 39	16 53	.9	2 8	3.1
50	5 59	18 16	0 32	1 50	17 5	.6	1 52	3.3
55	5 58	18 17	0 36	2 5	17 20	.4	1 31	3.6
60	5 56	18 19	0 42	2 27	17 40	.0	1 3	4.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 8 8.4	.7	16.1	$T_{\overline{m}}$	22 2	1.9	57.4	15.6
12	- 7 59.6	$T_{\overline{m}_\odot}$	12 h 8.0 min	Starost	10.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 50	.1	22	-3.8	♃	7 35	.0	70	-1.9
♂	18 36	.1	265	.6	♄	22 36	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 2.3	- 0 29.4	176 54.3	197 16.7	- 9 54.5	81 6.2	25 50.3
2	208 2.6	- 0 27.5	206 59.3	227 15.8	- 9 52.3	111 8.9	25 50.1
4	238 3.0	- 0 25.5	237 4.2	257 14.9	- 9 50.1	141 11.7	25 49.9
6	268 3.4	- 0 23.5	267 9.1	287 13.9	- 9 47.9	171 14.4	25 49.8
8	298 3.7	- 0 21.5	297 14.1	317 13.0	- 9 45.7	201 17.1	25 49.6
10	328 4.1	- 0 19.6	327 19.0	347 12.1	- 9 43.5	231 19.9	25 49.4
12	358 4.5	- 0 17.6	357 23.9	17 11.1	- 9 41.3	261 22.6	25 49.3
14	28 4.8	- 0 15.6	27 28.8	47 10.2	- 9 39.1	291 25.3	25 49.1
16	58 5.2	- 0 13.6	57 33.8	77 9.3	- 9 36.9	321 28.0	25 48.9
18	88 5.6	- 0 11.7	87 38.7	107 8.4	- 9 34.7	351 30.8	25 48.8
20	118 6.0	- 0 9.7	117 43.6	137 7.4	- 9 32.5	21 33.5	25 48.6
22	148 6.3	- 0 7.7	147 48.6	167 6.5	- 9 30.2	51 36.2	25 48.4
Δ	2	10		-5	11	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	28 38.2	130	12 59.9	-139	246 54.8	-22 6.8	20 56.7	12 .3
2	57 42.2	132	12 32.1	-140	276 59.0	-22 6.7	51 2.0	12 .4
4	86 46.5	133	12 4.0	-141	307 3.1	-22 6.7	81 7.2	12 .5
6	115 51.1	134	11 35.8	-142	337 7.3	-22 6.6	111 12.5	12 .7
8	144 56.0	136	11 7.5	-143	7 11.5	-22 6.5	141 17.7	12 .8
10	174 1.2	137	10 39.0	-143	37 15.7	-22 6.4	171 23.0	12 .9
12	203 6.6	138	10 10.3	-144	67 19.8	-22 6.3	201 28.2	12 1.0
14	232 12.3	140	9 41.5	-145	97 24.0	-22 6.2	231 33.5	12 1.2
16	261 18.2	141	9 12.5	-145	127 28.2	-22 6.1	261 38.8	12 1.3
18	290 24.4	142	8 43.4	-146	157 32.4	-22 6.0	291 44.0	12 1.4
20	319 30.7	143	8 14.3	-146	187 36.5	-22 6.0	321 49.3	12 1.5
22	348 37.4	144	7 45.0	-147	217 40.7	-22 5.9	351 54.5	12 1.6
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 4	18 13	0 42	2 26	15 29	3.7	5 39	.0
55	6 4	18 12	0 36	2 5	15 41	3.4	5 24	.3
50	6 4	18 12	0 32	1 50	15 50	3.1	5 12	.6
45	6 5	18 12	0 29	1 39	15 58	2.9	5 3	.8
40	6 5	18 11	0 27	1 31	16 4	2.7	4 55	1.0
35	6 5	18 11	0 25	1 25	16 10	2.6	4 48	1.1
30	6 5	18 11	0 24	1 20	16 14	2.4	4 42	1.2
20	6 5	18 11	0 22	1 13	16 23	2.2	4 31	1.5
10	6 5	18 11	0 21	1 10	16 30	2.0	4 22	1.7
0	6 4	18 11	0 21	1 9	16 36	1.8	4 13	1.9
10	6 4	18 11	0 21	1 10	16 43	1.6	4 4	2.0
20	6 4	18 11	0 22	1 13	16 50	1.4	3 54	2.2
30	6 3	18 12	0 24	1 20	16 58	1.2	3 43	2.5
35	6 3	18 12	0 25	1 25	17 3	1.1	3 37	2.6
40	6 2	18 13	0 27	1 31	17 8	.9	3 30	2.8
45	6 1	18 13	0 29	1 39	17 14	.8	3 21	2.9
50	6 1	18 14	0 32	1 50	17 21	.6	3 11	3.2
55	5 60	18 15	0 36	2 5	17 30	.3	2 58	3.4
60	5 58	18 16	0 42	2 26	17 41	.0	2 41	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 7 50.8	.7	16.1		22 47	1.8	56.9	15.5
12	- 7 41.9	$T_{\overline{m}_\odot}$ 12 h	7.7 min	Starost 11.3 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 51	.1	20	-3.8	♃	7 31	.0	70	-1.9
♂	18 34	.1	264	.6	♄	22 32	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 6.7	- 0 5.7	177 53.5	197 5.6	- 9 28.0	81 38.9	25 48.2
2	208 7.1	- 0 3.8	207 58.4	227 4.7	- 9 25.8	111 41.6	25 48.1
4	238 7.4	- 0 1.8	238 3.3	257 3.8	- 9 23.6	141 44.3	25 47.9
6	268 7.8	0 .2	268 8.3	287 2.8	- 9 21.4	171 47.0	25 47.7
8	298 8.2	0 2.2	298 13.2	317 1.9	- 9 19.2	201 49.7	25 47.6
10	328 8.6	0 4.1	328 18.1	347 1.0	- 9 17.0	231 52.4	25 47.4
12	358 8.9	0 6.1	358 23.1	17 .1	- 9 14.7	261 55.2	25 47.2
14	28 9.3	0 8.1	28 28.0	46 59.2	- 9 12.5	291 57.9	25 47.0
16	58 9.7	0 10.1	58 32.9	76 58.3	- 9 10.3	322 .6	25 46.9
18	88 10.1	0 12.0	88 37.8	106 57.4	- 9 8.1	352 3.3	25 46.7
20	118 10.4	0 14.0	118 42.8	136 56.5	- 9 5.8	22 5.9	25 46.5
22	148 10.8	0 16.0	148 47.7	166 55.6	- 9 3.6	52 8.6	25 46.3
Δ	2	10		-5	11	14	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	17 44.2	145	7 15.6	-147	247 44.9	-22 5.8	21 59.8	12 1.8
2	46 51.2	146	6 46.2	-148	277 49.1	-22 5.7	52 5.0	12 1.9
4	75 58.4	147	6 16.6	-148	307 53.3	-22 5.6	82 10.3	12 2.0
6	105 5.8	148	5 47.1	-148	337 57.4	-22 5.5	112 15.5	12 2.1
8	134 13.4	149	5 17.4	-148	8 1.6	-22 5.4	142 20.8	12 2.2
10	163 21.2	150	4 47.7	-149	38 5.8	-22 5.3	172 26.0	12 2.4
12	192 29.1	150	4 18.0	-149	68 10.0	-22 5.3	202 31.2	12 2.5
14	221 37.1	151	3 48.2	-149	98 14.2	-22 5.2	232 36.5	12 2.6
16	250 45.4	152	3 18.4	-149	128 18.4	-22 5.1	262 41.7	12 2.7
18	279 53.7	152	2 48.7	-149	158 22.6	-22 5.0	292 47.0	12 2.8
20	309 2.2	153	2 18.9	-149	188 26.7	-22 4.9	322 52.2	12 3.0
22	338 10.7	153	1 49.1	-149	218 30.9	-22 4.8	352 57.5	12 3.1
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 1	18 15	0 42	2 27	16 58	3.6	5 39	.0
55	6 2	18 14	0 36	2 5	17 2	3.3	5 32	.3
50	6 2	18 13	0 32	1 50	17 5	3.0	5 26	.5
45	6 3	18 13	0 29	1 39	17 7	2.8	5 22	.7
40	6 3	18 12	0 27	1 31	17 9	2.6	5 18	.9
35	6 3	18 12	0 25	1 25	17 11	2.5	5 15	1.0
30	6 4	18 12	0 24	1 20	17 13	2.4	5 12	1.2
20	6 4	18 11	0 22	1 13	17 15	2.1	5 6	1.4
10	6 4	18 11	0 21	1 10	17 18	1.9	5 2	1.6
0	6 4	18 11	0 21	1 9	17 20	1.8	4 57	1.8
10	6 4	18 11	0 21	1 10	17 22	1.6	4 53	2.0
20	6 4	18 11	0 22	1 13	17 24	1.4	4 48	2.2
30	6 4	18 11	0 24	1 20	17 27	1.2	4 43	2.4
35	6 3	18 11	0 25	1 24	17 28	1.0	4 40	2.5
40	6 3	18 11	0 27	1 31	17 30	.9	4 36	2.7
45	6 3	18 11	0 29	1 39	17 32	.7	4 32	2.9
50	6 2	18 12	0 32	1 49	17 34	.5	4 27	3.1
55	6 2	18 12	0 36	2 4	17 37	.3	4 20	3.3
60	6 1	18 13	0 41	2 25	17 41	.0	4 12	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 7 33.0	.7	16.1		23 30	1.8	56.4	15.4
12	- 7 24.0	$T_{\overline{m}_\odot}$ 12 h	7.4 min	Starost 12.3 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 52	.1	19	-3.8	♃	7 28	.0	70	-1.9
♂	18 32	.1	264	.6	♄	22 28	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 11.2	0 18.0	178 52.6	196 54.7	- 9 1.4	82 11.3	25 46.1
2	208 11.6	0 19.9	208 57.5	226 53.8	- 8 59.1	112 14.0	25 46.0
4	238 11.9	0 21.9	239 2.5	256 52.8	- 8 56.9	142 16.7	25 45.8
6	268 12.3	0 23.9	269 7.4	286 51.9	- 8 54.6	172 19.4	25 45.6
8	298 12.7	0 25.9	299 12.3	316 51.0	- 8 52.4	202 22.1	25 45.4
10	328 13.1	0 27.8	329 17.3	346 50.2	- 8 50.2	232 24.8	25 45.2
12	358 13.4	0 29.8	359 22.2	16 49.3	- 8 47.9	262 27.4	25 45.1
14	28 13.8	0 31.8	29 27.1	46 48.4	- 8 45.7	292 30.1	25 44.9
16	58 14.2	0 33.8	59 32.0	76 47.5	- 8 43.4	322 32.8	25 44.7
18	88 14.6	0 35.7	89 37.0	106 46.6	- 8 41.2	352 35.5	25 44.5
20	118 14.9	0 37.7	119 41.9	136 45.7	- 8 38.9	22 38.2	25 44.3
22	148 15.3	0 39.7	149 46.8	166 44.8	- 8 36.7	52 40.8	25 44.2
Δ	2	10		-4	11	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	7 19.4	154	1 19.3	-149	248 35.1	-22 4.7	23 2.7	12 3.2
2	36 28.2	154	0 49.5	-149	278 39.3	-22 4.6	53 8.0	12 3.3
4	65 37.1	155	0 19.8	-148	308 43.5	-22 4.6	83 13.2	12 3.4
6	94 46.1	155	- 0 9.9	-148	338 47.7	-22 4.5	113 18.5	12 3.5
8	123 55.1	156	- 0 39.5	-148	8 51.9	-22 4.4	143 23.7	12 3.7
10	153 4.2	156	- 1 9.1	-148	38 56.1	-22 4.3	173 28.9	12 3.8
12	182 13.3	156	- 1 38.7	-147	69 .3	-22 4.2	203 34.2	12 3.9
14	211 22.6	156	- 2 8.1	-147	99 4.5	-22 4.1	233 39.4	12 4.0
16	240 31.8	156	- 2 37.5	-147	129 8.7	-22 4.0	263 44.7	12 4.1
18	269 41.1	157	- 3 6.8	-146	159 12.9	-22 4.0	293 49.9	12 4.3
20	298 50.4	157	- 3 36.1	-146	189 17.1	-22 3.9	323 55.2	12 4.4
22	327 59.7	157	- 4 5.2	-145	219 21.3	-22 3.8	354 .4	12 4.5
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 58	18 18	0 42	2 28	18 25	3.6	5 39	.0
55	5 59	18 16	0 36	2 5	18 21	3.2	5 39	.3
50	6 0	18 15	0 32	1 50	18 18	3.0	5 39	.5
45	6 1	18 14	0 29	1 39	18 15	2.8	5 40	.7
40	6 1	18 13	0 27	1 31	18 13	2.6	5 40	.9
35	6 2	18 13	0 25	1 25	18 11	2.5	5 40	1.0
30	6 2	18 12	0 24	1 20	18 9	2.3	5 40	1.1
20	6 3	18 11	0 22	1 13	18 6	2.1	5 40	1.4
10	6 4	18 11	0 21	1 10	18 4	1.9	5 40	1.6
0	6 4	18 10	0 21	1 9	18 2	1.7	5 40	1.7
10	6 4	18 10	0 21	1 10	17 59	1.6	5 40	1.9
20	6 4	18 10	0 22	1 13	17 57	1.4	5 40	2.1
30	6 4	18 9	0 24	1 20	17 54	1.2	5 40	2.3
35	6 4	18 9	0 25	1 24	17 53	1.0	5 40	2.5
40	6 4	18 9	0 27	1 31	17 51	.9	5 40	2.6
45	6 4	18 9	0 29	1 39	17 49	.7	5 40	2.8
50	6 4	18 9	0 32	1 49	17 47	.5	5 40	3.0
55	6 4	18 9	0 36	2 4	17 44	.3	5 40	3.3
60	6 3	18 10	0 41	2 25	17 40	.0	5 40	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 7 15.1	.8	16.1	$T_{\overline{m}}$	. . . .	1.0	55.9	15.2
12	- 7 6.1	$T_{\overline{m}_\odot}$ 12 h 7.1 min		Starost 13.3 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 53	.1	18	-3.8	♄	7 25	.0	70	-1.9
♂	18 30	.1	263	.6	♅	22 24	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 15.7	0 41.6	179 51.8	196 43.9	- 8 34.4	82 43.5	25 44.0
2	208 16.1	0 43.6	209 56.7	226 43.0	- 8 32.2	112 46.2	25 43.8
4	238 16.4	0 45.6	240 1.6	256 42.1	- 8 29.9	142 48.8	25 43.6
6	268 16.8	0 47.6	270 6.5	286 41.2	- 8 27.7	172 51.5	25 43.4
8	298 17.2	0 49.5	300 11.5	316 40.4	- 8 25.4	202 54.2	25 43.2
10	328 17.6	0 51.5	330 16.4	346 39.5	- 8 23.1	232 56.8	25 43.0
12	358 17.9	0 53.5	0 21.3	16 38.6	- 8 20.9	262 59.5	25 42.8
14	28 18.3	0 55.4	30 26.3	46 37.7	- 8 18.6	293 2.1	25 42.7
16	58 18.7	0 57.4	60 31.2	76 36.8	- 8 16.4	323 4.8	25 42.5
18	88 19.1	0 59.4	90 36.1	106 35.9	- 8 14.1	353 7.4	25 42.3
20	118 19.5	1 1.4	120 41.0	136 35.1	- 8 11.8	23 10.1	25 42.1
22	148 19.8	1 3.3	150 46.0	166 34.2	- 8 9.5	53 12.8	25 41.9
Δ	2	10		-4	11	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 9.0	157	- 4 34.2	-145	249 25.5	-22 3.7	24 5.6	12 4.6
2	26 18.4	157	- 5 3.1	-144	279 29.7	-22 3.6	54 10.9	12 4.7
4	55 27.7	157	- 5 31.9	-143	309 33.9	-22 3.5	84 16.1	12 4.8
6	84 37.0	156	- 6 .5	-143	339 38.1	-22 3.4	114 21.4	12 5.0
8	113 46.3	156	- 6 29.1	-142	9 42.3	-22 3.4	144 26.6	12 5.1
10	142 55.6	156	- 6 57.5	-141	39 46.5	-22 3.3	174 31.8	12 5.2
12	172 4.8	156	- 7 25.7	-140	69 50.7	-22 3.2	204 37.1	12 5.3
14	201 14.0	156	- 7 53.8	-140	99 54.9	-22 3.1	234 42.3	12 5.4
16	230 23.1	155	- 8 21.7	-139	129 59.2	-22 3.0	264 47.5	12 5.5
18	259 32.2	155	- 8 49.4	-138	160 3.4	-22 2.9	294 52.8	12 5.6
20	288 41.2	155	- 9 17.0	-137	190 7.6	-22 2.8	324 58.0	12 5.8
22	317 50.1	154	- 9 44.4	-136	220 11.8	-22 2.8	355 3.3	12 5.9
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 55	18 20	0 42	2 28	19 51	3.6	5 39	.0
55	5 57	18 18	0 36	2 6	19 39	3.3	5 46	.3
50	5 58	18 17	0 32	1 51	19 29	3.0	5 52	.6
45	5 59	18 15	0 29	1 40	19 22	2.8	5 57	.8
40	5 60	18 14	0 27	1 31	19 15	2.6	6 1	.9
35	6 1	18 14	0 25	1 25	19 10	2.5	6 4	1.1
30	6 1	18 13	0 24	1 20	19 5	2.3	6 7	1.2
20	6 2	18 12	0 22	1 13	18 57	2.1	6 13	1.4
10	6 3	18 11	0 21	1 10	18 50	1.9	6 17	1.6
0	6 4	18 10	0 21	1 9	18 44	1.8	6 22	1.8
10	6 4	18 9	0 21	1 10	18 37	1.6	6 26	1.9
20	6 4	18 9	0 22	1 13	18 30	1.4	6 31	2.1
30	6 5	18 8	0 24	1 20	18 22	1.2	6 36	2.3
35	6 5	18 8	0 25	1 24	18 18	1.1	6 40	2.5
40	6 5	18 8	0 27	1 30	18 13	1.0	6 43	2.6
45	6 5	18 7	0 29	1 38	18 7	.8	6 47	2.8
50	6 5	18 7	0 32	1 49	17 60	.6	6 52	3.0
55	6 6	18 7	0 36	2 3	17 51	.3	6 59	3.2
60	6 6	18 7	0 41	2 24	17 40	.0	7 7	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 6 57.1	.8	16.1	$T_{\overline{m}}$	0 12	1.7	55.5	15.1
12	- 6 48.0	$T_{\overline{m}_\odot}$ 12 h 6.8 min		Starost 14.3 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 53	.1	17	-3.8	♄	7 21	.0	70	-1.9
♂	18 27	.1	263	.6	♅	22 20	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 20.2	1 5.3	180 50.9	196 33.3	- 8 7.3	83 15.4	25 41.7
2	208 20.6	1 7.3	210 55.8	226 32.4	- 8 5.0	113 18.0	25 41.5
4	238 21.0	1 9.2	241 .8	256 31.6	- 8 2.7	143 20.7	25 41.3
6	268 21.3	1 11.2	271 5.7	286 30.7	- 8 .4	173 23.3	25 41.1
8	298 21.7	1 13.2	301 10.6	316 29.8	- 7 58.2	203 26.0	25 40.9
10	328 22.1	1 15.1	331 15.5	346 29.0	- 7 55.9	233 28.6	25 40.7
12	358 22.5	1 17.1	1 20.5	16 28.1	- 7 53.6	263 31.3	25 40.5
14	28 22.9	1 19.1	31 25.4	46 27.2	- 7 51.3	293 33.9	25 40.4
16	58 23.2	1 21.1	61 30.3	76 26.4	- 7 49.0	323 36.5	25 40.2
18	88 23.6	1 23.0	91 35.3	106 25.5	- 7 46.8	353 39.2	25 40.0
20	118 24.0	1 25.0	121 40.2	136 24.6	- 7 44.5	23 41.8	25 39.8
22	148 24.4	1 27.0	151 45.1	166 23.8	- 7 42.2	53 44.4	25 39.6
Δ	2	10		-4	11	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	346 59.0	154	-10 11.6	-135	250 16.0	-22 2.7	25 8.5	12 6.0
2	16 7.8	153	-10 38.6	-134	280 20.2	-22 2.6	55 13.7	12 6.1
4	45 16.4	153	-11 5.4	-133	310 24.4	-22 2.5	85 19.0	12 6.2
6	74 25.0	152	-11 32.0	-132	340 28.7	-22 2.4	115 24.2	12 6.3
8	103 33.5	152	-11 58.4	-131	10 32.9	-22 2.3	145 29.4	12 6.4
10	132 41.8	151	-12 24.5	-130	40 37.1	-22 2.3	175 34.7	12 6.6
12	161 50.1	151	-12 50.5	-128	70 41.3	-22 2.2	205 39.9	12 6.7
14	190 58.2	150	-13 16.2	-127	100 45.5	-22 2.1	235 45.1	12 6.8
16	220 6.2	149	-13 41.6	-126	130 49.8	-22 2.0	265 50.4	12 6.9
18	249 14.1	149	-14 6.8	-125	160 54.0	-22 1.9	295 55.6	12 7.0
20	278 21.8	148	-14 31.7	-123	190 58.2	-22 1.8	326 .8	12 7.1
22	307 29.3	147	-14 56.4	-122	221 2.4	-22 1.7	356 6.0	12 7.2
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 52	18 23	0 42	2 29	21 18	3.7	5 39	.0
55	5 54	18 20	0 36	2 6	20 57	3.3	5 54	.4
50	5 56	18 18	0 32	1 51	20 41	3.0	6 6	.6
45	5 57	18 17	0 29	1 40	20 28	2.8	6 15	.8
40	5 58	18 15	0 27	1 31	20 18	2.6	6 23	1.0
35	5 59	18 14	0 25	1 25	20 9	2.5	6 30	1.1
30	5 60	18 13	0 24	1 20	20 1	2.4	6 36	1.3
20	6 1	18 12	0 22	1 13	19 48	2.2	6 46	1.5
10	6 2	18 11	0 21	1 10	19 37	2.0	6 55	1.6
0	6 3	18 10	0 21	1 9	19 26	1.8	7 4	1.8
10	6 4	18 9	0 21	1 10	19 15	1.7	7 12	2.0
20	6 5	18 8	0 22	1 13	19 4	1.5	7 22	2.1
30	6 5	18 7	0 24	1 20	18 51	1.3	7 32	2.3
35	6 6	18 7	0 25	1 24	18 44	1.2	7 39	2.5
40	6 6	18 6	0 27	1 30	18 35	1.1	7 46	2.6
45	6 7	18 6	0 29	1 38	18 26	.9	7 54	2.8
50	6 7	18 5	0 32	1 49	18 14	.7	8 4	3.0
55	6 8	18 4	0 36	2 3	17 59	.4	8 17	3.3
60	6 8	18 4	0 41	2 23	17 40	.1	8 33	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 39.0	.8	16.1	$T_{\overline{m}}$ 0 54	1.8	55.0	15.0
12	- 6 29.9	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 15.3 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 54	.1	16	-3.8	♃	7 18	.0	69	-1.9
♂	18 25	.1	262	.6	♄	22 16	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.8	1 28.9	181 50.0	196 22.9	- 7 39.9	83 47.0	25 39.4
2	208 25.1	1 30.9	211 55.0	226 22.1	- 7 37.6	113 49.7	25 39.2
4	238 25.5	1 32.9	241 59.9	256 21.2	- 7 35.3	143 52.3	25 39.0
6	268 25.9	1 34.8	272 4.8	286 20.3	- 7 33.0	173 54.9	25 38.8
8	298 26.3	1 36.8	302 9.8	316 19.5	- 7 30.7	203 57.5	25 38.6
10	328 26.6	1 38.8	332 14.7	346 18.6	- 7 28.4	234 .2	25 38.4
12	358 27.0	1 40.7	2 19.6	16 17.8	- 7 26.1	264 2.8	25 38.2
14	28 27.4	1 42.7	32 24.5	46 16.9	- 7 23.8	294 5.4	25 38.0
16	58 27.8	1 44.7	62 29.5	76 16.1	- 7 21.5	324 8.0	25 37.8
18	88 28.2	1 46.6	92 34.4	106 15.2	- 7 19.2	354 10.6	25 37.6
20	118 28.5	1 48.6	122 39.3	136 14.4	- 7 16.9	24 13.2	25 37.3
22	148 28.9	1 50.6	152 44.2	166 13.5	- 7 14.6	54 15.8	25 37.1
Δ	2	10		-4	11	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 36.8	146	-15 20.8	-121	251 6.7	-22 1.7	26 11.3	12 7.3
2	5 44.0	145	-15 45.0	-119	281 10.9	-22 1.6	56 16.5	12 7.5
4	34 51.1	145	-16 8.8	-118	311 15.1	-22 1.5	86 21.7	12 7.6
6	63 58.1	144	-16 32.4	-116	341 19.4	-22 1.4	116 27.0	12 7.7
8	93 4.8	143	-16 55.6	-115	11 23.6	-22 1.3	146 32.2	12 7.8
10	122 11.4	142	-17 18.6	-113	41 27.8	-22 1.2	176 37.4	12 7.9
12	151 17.8	141	-17 41.3	-112	71 32.1	-22 1.2	206 42.6	12 8.0
14	180 24.0	140	-18 3.6	-110	101 36.3	-22 1.1	236 47.9	12 8.1
16	209 30.1	139	-18 25.7	-109	131 40.5	-22 1.0	266 53.1	12 8.2
18	238 35.9	138	-18 47.4	-107	161 44.8	-22 .9	296 58.3	12 8.3
20	267 41.6	137	-19 8.7	-105	191 49.0	-22 .8	327 3.5	12 8.4
22	296 47.0	136	-19 29.7	-103	221 53.2	-22 .7	357 8.8	12 8.6
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 49	18 25	0 42	2 30	22 47	3.8	5 40	.1
55	5 51	18 22	0 36	2 7	22 16	3.3	6 3	.5
50	5 54	18 20	0 32	1 51	21 53	3.0	6 21	.8
45	5 55	18 18	0 29	1 40	21 35	2.8	6 35	1.0
40	5 57	18 16	0 27	1 32	21 21	2.6	6 47	1.1
35	5 58	18 15	0 25	1 25	21 9	2.5	6 57	1.3
30	5 59	18 14	0 24	1 20	20 58	2.4	7 6	1.4
20	6 0	18 12	0 22	1 13	20 40	2.2	7 21	1.6
10	6 2	18 11	0 21	1 10	20 24	2.1	7 34	1.7
0	6 3	18 9	0 21	1 9	20 10	1.9	7 47	1.9
10	6 4	18 8	0 21	1 10	19 55	1.8	7 60	2.0
20	6 5	18 7	0 22	1 13	19 40	1.6	8 13	2.2
30	6 6	18 6	0 24	1 19	19 23	1.5	8 29	2.4
35	6 7	18 5	0 25	1 24	19 12	1.4	8 38	2.5
40	6 7	18 5	0 27	1 30	19 1	1.2	8 48	2.6
45	6 8	18 4	0 29	1 38	18 47	1.1	9 1	2.8
50	6 9	18 3	0 32	1 49	18 31	.9	9 16	3.0
55	6 10	18 2	0 36	2 3	18 10	.6	9 35	3.3
60	6 11	18 0	0 41	2 23	17 42	.2	10 1	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 20.8	.8	16.1	$T_{\overline{m}}$ 1 36	1.9	54.6	14.9
12	- 6 11.7	$T_{\overline{m}_\odot}$ 12 h 6.2 min		Starost 16.3 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 55	.1	15	-3.8	♃	7 15	.0	69	-2.0
♂	18 23	.1	262	.7	♄	22 11	.0	204	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 29.3	1 52.5	182 49.2	196 12.7	- 7 12.3	84 18.5	25 36.9
2	208 29.7	1 54.5	212 54.1	226 11.8	- 7 10.0	114 21.1	25 36.7
4	238 30.1	1 56.4	242 59.0	256 11.0	- 7 7.7	144 23.7	25 36.5
6	268 30.4	1 58.4	273 4.0	286 10.1	- 7 5.4	174 26.3	25 36.3
8	298 30.8	2 .4	303 8.9	316 9.3	- 7 3.1	204 28.9	25 36.1
10	328 31.2	2 2.3	333 13.8	346 8.5	- 7 .7	234 31.5	25 35.9
12	358 31.6	2 4.3	3 18.7	16 7.6	- 6 58.4	264 34.1	25 35.7
14	28 32.0	2 6.3	33 23.7	46 6.8	- 6 56.1	294 36.7	25 35.5
16	58 32.3	2 8.2	63 28.6	76 5.9	- 6 53.8	324 39.3	25 35.3
18	88 32.7	2 10.2	93 33.5	106 5.1	- 6 51.5	354 41.8	25 35.1
20	118 33.1	2 12.1	123 38.5	136 4.3	- 6 49.2	24 44.4	25 34.8
22	148 33.5	2 14.1	153 43.4	166 3.4	- 6 46.8	54 47.0	25 34.6
Δ	2	10		-4	12	13	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 52.3	135	-19 50.4	-102	251 57.5	-22 .7	27 14.0	12 8.7
2	354 57.3	134	-20 10.8	-100	282 1.7	-22 .6	57 19.2	12 8.8
4	24 2.1	133	-20 30.7	-98	312 6.0	-22 .5	87 24.4	12 8.9
6	53 6.8	132	-20 50.3	-96	342 10.2	-22 .4	117 29.7	12 9.0
8	82 11.2	131	-21 9.6	-94	12 14.4	-22 .3	147 34.9	12 9.1
10	111 15.4	130	-21 28.5	-92	42 18.7	-22 .2	177 40.1	12 9.2
12	140 19.4	129	-21 46.9	-90	72 22.9	-22 .2	207 45.3	12 9.3
14	169 23.2	128	-22 5.0	-89	102 27.2	-22 .1	237 50.6	12 9.4
16	198 26.7	127	-22 22.7	-87	132 31.4	-22 .0	267 55.8	12 9.5
18	227 30.1	126	-22 40.0	-85	162 35.7	-21 59.9	298 1.0	12 9.6
20	256 33.2	125	-22 56.9	-82	192 39.9	-21 59.8	328 6.2	12 9.7
22	285 36.1	124	-23 13.4	-80	222 44.2	-21 59.8	358 11.4	12 9.9
Δ					21	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 46	18 28	0 42	2 31	. . . .	.0	5 42	.2
55	5 49	18 24	0 37	2 8	23 34	3.1	6 15	.7
50	5 51	18 21	0 32	1 52	23 4	2.9	6 40	1.0
45	5 53	18 19	0 29	1 40	22 42	2.7	6 59	1.2
40	5 55	18 17	0 27	1 32	22 23	2.6	7 14	1.3
35	5 56	18 16	0 25	1 25	22 8	2.5	7 27	1.5
30	5 58	18 15	0 24	1 20	21 55	2.4	7 39	1.5
20	5 60	18 13	0 22	1 14	21 33	2.2	7 58	1.7
10	6 1	18 11	0 21	1 10	21 14	2.1	8 16	1.8
0	6 3	18 9	0 21	1 9	20 56	2.0	8 32	2.0
10	6 4	18 8	0 21	1 10	20 38	1.9	8 48	2.1
20	6 5	18 6	0 22	1 13	20 19	1.8	9 6	2.2
30	6 7	18 5	0 24	1 19	19 58	1.7	9 26	2.4
35	6 7	18 4	0 25	1 24	19 45	1.6	9 38	2.5
40	6 8	18 3	0 27	1 30	19 30	1.5	9 51	2.6
45	6 9	18 2	0 29	1 38	19 13	1.3	10 7	2.7
50	6 10	18 1	0 32	1 48	18 52	1.2	10 27	2.9
55	6 11	17 59	0 36	2 2	18 25	.9	10 54	3.2
60	6 13	17 57	0 41	2 22	17 45	.3	11 31	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 6 2.6	.8	16.1	$T_{\overline{m}}$ 2 21	1.9	54.4	14.8
12	- 5 53.5	$T_{\overline{m}_\odot}$ 12 h 5.9 min		Starost 17.3 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 55	.1	13	-3.8	♄	7 11	.0	69	-2.0
♂	18 21	.1	261	.7	♄	22 7	.0	204	.4

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 33.9	2 16.1	183 48.3	196 2.6	- 6 44.5	84 49.6	25 34.4
2	208 34.2	2 18.0	213 53.2	226 1.8	- 6 42.2	114 52.2	25 34.2
4	238 34.6	2 20.0	243 58.2	256 .9	- 6 39.9	144 54.8	25 34.0
6	268 35.0	2 21.9	274 3.1	286 .1	- 6 37.5	174 57.4	25 33.8
8	298 35.4	2 23.9	304 8.0	315 59.3	- 6 35.2	204 60.0	25 33.6
10	328 35.8	2 25.9	334 13.0	345 58.4	- 6 32.9	235 2.5	25 33.3
12	358 36.1	2 27.8	4 17.9	15 57.6	- 6 30.5	265 5.1	25 33.1
14	28 36.5	2 29.8	34 22.8	45 56.8	- 6 28.2	295 7.7	25 32.9
16	58 36.9	2 31.7	64 27.7	75 55.9	- 6 25.9	325 10.3	25 32.7
18	88 37.3	2 33.7	94 32.7	105 55.1	- 6 23.5	355 12.8	25 32.5
20	118 37.7	2 35.7	124 37.6	135 54.3	- 6 21.2	25 15.4	25 32.3
22	148 38.0	2 37.6	154 42.5	165 53.5	- 6 18.9	55 18.0	25 32.0
Δ	2	10		-4	12	13	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	314 38.8	122	-23 29.5	-78	252 48.4	-21 59.7	28 16.7	12 10.0
2	343 41.3	121	-23 45.1	-76	282 52.7	-21 59.6	58 21.9	12 10.1
4	12 43.6	120	-24 .4	-74	312 56.9	-21 59.5	88 27.1	12 10.2
6	41 45.6	119	-24 15.1	-72	343 1.2	-21 59.4	118 32.3	12 10.3
8	70 47.5	118	-24 29.5	-70	13 5.4	-21 59.3	148 37.5	12 10.4
10	99 49.1	117	-24 43.4	-67	43 9.7	-21 59.3	178 42.7	12 10.5
12	128 50.5	116	-24 56.8	-65	73 14.0	-21 59.2	208 48.0	12 10.6
14	157 51.7	115	-25 9.8	-63	103 18.2	-21 59.1	238 53.2	12 10.7
16	186 52.8	114	-25 22.4	-60	133 22.5	-21 59.0	268 58.4	12 10.8
18	215 53.6	113	-25 34.4	-58	163 26.7	-21 58.9	299 3.6	12 10.9
20	244 54.2	112	-25 46.0	-56	193 31.0	-21 58.9	329 8.8	12 11.0
22	273 54.6	111	-25 57.2	-53	223 35.3	-21 58.8	359 14.0	12 11.1
Δ					21	0	26	1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 43	18 30	0 42	2 32	0 20	3.7	5 47	.5
55	5 46	18 26	0 37	2 8	. . . .	.0	6 32	1.1
50	5 49	18 23	0 33	1 52	. . . .	.0	7 4	1.3
45	5 51	18 21	0 29	1 40	23 46	2.5	7 27	1.5
40	5 53	18 18	0 27	1 32	23 25	2.4	7 46	1.6
35	5 55	18 17	0 25	1 25	23 7	2.4	8 2	1.7
30	5 56	18 15	0 24	1 20	22 52	2.3	8 16	1.8
20	5 59	18 13	0 22	1 14	22 27	2.2	8 39	1.9
10	6 1	18 11	0 21	1 10	22 5	2.2	8 60	2.0
0	6 2	18 9	0 21	1 9	21 44	2.1	9 19	2.1
10	6 4	18 7	0 21	1 10	21 24	2.0	9 38	2.1
20	6 6	18 5	0 22	1 13	21 2	2.0	9 59	2.2
30	6 7	18 3	0 24	1 19	20 37	1.9	10 23	2.3
35	6 8	18 2	0 25	1 24	20 22	1.8	10 37	2.4
40	6 9	18 1	0 27	1 30	20 5	1.8	10 53	2.5
45	6 10	17 60	0 29	1 38	19 45	1.7	11 13	2.6
50	6 12	17 58	0 32	1 48	19 20	1.5	11 38	2.7
55	6 13	17 57	0 36	2 2	18 46	1.3	12 11	3.0
60	6 15	17 54	0 41	2 22	17 54	.8	13 2	3.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 5 44.4	.8	16.1	$T_{\overline{m}}$ 3 7	2.0	54.2	14.8
12	- 5 35.3	$T_{\overline{m}_\odot}$ 12 h 5.6 min		Starost 18.3 d	Faza ◑		

PLANETE Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 56	.1	12	-3.8	♄	7 8	.0	69	-2.0
♂	18 19	.1	261	.7	♄	22 3	.0	204	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 38.4	2 39.6	184 47.5	195 52.7	− 6 16.5	85 20.5	25 31.8
2	208 38.8	2 41.5	214 52.4	225 51.8	− 6 14.2	115 23.1	25 31.6
4	238 39.2	2 43.5	244 57.3	255 51.0	− 6 11.9	145 25.7	25 31.4
6	268 39.5	2 45.4	275 2.2	285 50.2	− 6 9.5	175 28.2	25 31.2
8	298 39.9	2 47.4	305 7.2	315 49.4	− 6 7.2	205 30.8	25 30.9
10	328 40.3	2 49.4	335 12.1	345 48.6	− 6 4.8	235 33.4	25 30.7
12	358 40.7	2 51.3	5 17.0	15 47.7	− 6 2.5	265 35.9	25 30.5
14	28 41.1	2 53.3	35 22.0	45 46.9	− 6 .1	295 38.5	25 30.3
16	58 41.4	2 55.2	65 26.9	75 46.1	− 5 57.8	325 41.0	25 30.0
18	88 41.8	2 57.2	95 31.8	105 45.3	− 5 55.4	355 43.6	25 29.8
20	118 42.2	2 59.1	125 36.7	135 44.5	− 5 53.1	25 46.2	25 29.6
22	148 42.6	3 1.1	155 41.7	165 43.7	− 5 50.7	55 48.7	25 29.3
Δ	2	10		−4	12	13	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	302 54.8	110	−26 7.8	−51	253 39.5	−21 58.7	29 19.2	12 11.2
2	331 54.8	109	−26 18.0	−48	283 43.8	−21 58.6	59 24.5	12 11.3
4	0 54.7	108	−26 27.6	−46	313 48.1	−21 58.5	89 29.7	12 11.4
6	29 54.4	108	−26 36.8	−43	343 52.3	−21 58.5	119 34.9	12 11.5
8	58 53.9	107	−26 45.5	−41	13 56.6	−21 58.4	149 40.1	12 11.6
10	87 53.2	106	−26 53.7	−38	44 .9	−21 58.3	179 45.3	12 11.7
12	116 52.4	105	−27 1.3	−36	74 5.1	−21 58.2	209 50.5	12 11.8
14	145 51.4	104	−27 8.5	−33	104 9.4	−21 58.1	239 55.7	12 12.0
16	174 50.3	104	−27 15.2	−31	134 13.7	−21 58.1	270 .9	12 12.1
18	203 49.0	103	−27 21.3	−28	164 18.0	−21 58.0	300 6.1	12 12.2
20	232 47.6	102	−27 26.9	−25	194 22.2	−21 57.9	330 11.4	12 12.3
22	261 46.0	102	−27 32.0	−23	224 26.5	−21 57.8	0 16.6	12 12.4
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 40	18 32	0 42	2 34	1 49	3.3	5 58	1.1
55	5 44	18 28	0 37	2 9	0 50	2.8	6 58	1.6
50	5 47	18 25	0 33	1 52	0 13	2.6	7 35	1.8
45	5 50	18 22	0 30	1 41	. . ..	.0	8 3	1.8
40	5 52	18 20	0 27	1 32	. . ..	.0	8 24	1.9
35	5 54	18 18	0 25	1 25	. . ..	.0	8 42	2.0
30	5 55	18 16	0 24	1 20	23 47	2.2	8 58	2.0
20	5 58	18 13	0 22	1 14	23 20	2.2	9 24	2.0
10	6 0	18 11	0 21	1 10	22 56	2.2	9 47	2.1
0	6 2	18 9	0 21	1 9	22 35	2.1	10 8	2.1
10	6 4	18 7	0 21	1 10	22 13	2.1	10 30	2.2
20	6 6	18 4	0 22	1 13	21 49	2.1	10 52	2.2
30	6 8	18 2	0 24	1 19	21 22	2.1	11 19	2.2
35	6 9	18 1	0 25	1 24	21 6	2.1	11 35	2.3
40	6 10	17 60	0 27	1 30	20 48	2.1	11 53	2.3
45	6 12	17 58	0 29	1 38	20 25	2.0	12 15	2.3
50	6 13	17 56	0 32	1 48	19 57	2.0	12 43	2.4
55	6 15	17 54	0 36	2 2	19 17	1.9	13 22	2.5
60	6 18	17 51	0 41	2 21	18 12	1.7	14 27	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	− 5 26.2	.8	16.1	$T_{\overline{m}}$	3 56	2.1	54.1	14.7
12	− 5 17.1	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost 19.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 57	.1	11	−3.8	♃	7 4	.0	69	−2.0
♂	18 17	.1	261	.7	♄	21 59	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 43.0	3 3.0	185 46.6	195 42.9	− 5 48.4	85 51.3	25 29.1
2	208 43.3	3 5.0	215 51.5	225 42.0	− 5 46.0	115 53.8	25 28.9
4	238 43.7	3 6.9	245 56.4	255 41.2	− 5 43.7	145 56.4	25 28.7
6	268 44.1	3 8.9	276 1.4	285 40.4	− 5 41.3	175 58.9	25 28.4
8	298 44.5	3 10.8	306 6.3	315 39.6	− 5 39.0	206 1.4	25 28.2
10	328 44.8	3 12.8	336 11.2	345 38.8	− 5 36.6	236 4.0	25 28.0
12	358 45.2	3 14.7	6 16.2	15 38.0	− 5 34.2	266 6.5	25 27.7
14	28 45.6	3 16.7	36 21.1	45 37.2	− 5 31.9	296 9.1	25 27.5
16	58 46.0	3 18.6	66 26.0	75 36.4	− 5 29.5	326 11.6	25 27.3
18	88 46.4	3 20.6	96 30.9	105 35.6	− 5 27.2	356 14.1	25 27.0
20	118 46.7	3 22.5	126 35.9	135 34.8	− 5 24.8	26 16.7	25 26.8
22	148 47.1	3 24.5	156 40.8	165 34.0	− 5 22.4	56 19.2	25 26.6
Δ	2	10		−4	12	13	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 44.4	101	−27 36.6	−20	254 30.8	−21 57.7	30 21.8	12 12.5
2	319 42.6	101	−27 40.6	−18	284 35.1	−21 57.7	60 27.0	12 12.6
4	348 40.7	100	−27 44.1	−15	314 39.3	−21 57.6	90 32.2	12 12.7
6	17 38.7	100	−27 47.1	−12	344 43.6	−21 57.5	120 37.4	12 12.8
8	46 36.6	99	−27 49.5	−9	14 47.9	−21 57.4	150 42.6	12 12.9
10	75 34.4	99	−27 51.4	−7	44 52.2	−21 57.3	180 47.8	12 13.0
12	104 32.1	98	−27 52.7	−4	74 56.5	−21 57.3	210 53.0	12 13.1
14	133 29.8	98	−27 53.5	−1	105 .8	−21 57.2	240 58.2	12 13.2
16	162 27.4	98	−27 53.8	1	135 5.0	−21 57.1	271 3.4	12 13.3
18	191 25.0	98	−27 53.5	4	165 9.3	−21 57.0	301 8.6	12 13.4
20	220 22.5	97	−27 52.7	7	195 13.6	−21 57.0	331 13.8	12 13.5
22	249 20.0	97	−27 51.3	10	225 17.9	−21 56.9	1 19.0	12 13.6
Δ					21	0	26	1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 37	18 35	0 43	2 35	3 7	2.2	6 25	2.3
55	5 41	18 30	0 37	2 9	1 56	2.2	7 36	2.3
50	5 45	18 26	0 33	1 53	1 15	2.2	8 17	2.2
45	5 48	18 23	0 30	1 41	0 46	2.2	8 47	2.2
40	5 50	18 21	0 27	1 32	0 23	2.2	9 10	2.2
35	5 52	18 18	0 25	1 26	0 4	2.2	9 29	2.2
30	5 54	18 17	0 24	1 21	. . ..	.0	9 46	2.2
20	5 57	18 13	0 22	1 14	. . ..	.0	10 13	2.2
10	5 59	18 11	0 21	1 10	23 48	2.1	10 37	2.2
0	6 2	18 8	0 21	1 9	23 26	2.2	10 59	2.2
10	6 4	18 6	0 21	1 10	23 4	2.2	11 22	2.1
20	6 6	18 4	0 22	1 13	22 40	2.2	11 45	2.1
30	6 8	18 1	0 24	1 19	22 13	2.3	12 13	2.1
35	6 10	17 60	0 25	1 24	21 56	2.3	12 29	2.1
40	6 11	17 58	0 27	1 30	21 37	2.4	12 48	2.1
45	6 13	17 56	0 29	1 38	21 14	2.4	13 11	2.0
50	6 15	17 54	0 32	1 48	20 45	2.5	13 41	2.0
55	6 17	17 52	0 36	2 2	20 3	2.6	14 22	1.9
60	6 20	17 48	0 41	2 21	18 52	2.9	15 33	1.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h	min	min	′	′
00	− 5 8.0	.8	16.0	$T_{\overline{m}}$	4 47	2.2	54.2	14.8
12	− 4 58.9	$T_{\overline{m}_\odot}$ 12 h 5.0 min		Starost 20.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	10 57	.1	10	−3.8	♃	7 1	.0	69	−2.0
♂	18 15	.1	260	.7	♄	21 55	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	$S_♀$	$\delta_♀$	$S_♂$	$\delta_♂$
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 47.5	3 26.4	186 45.7	195 33.2	-5 20.1	86 21.7	25 26.3
2	208 47.9	3 28.4	216 50.7	225 32.4	-5 17.7	116 24.3	25 26.1
4	238 48.2	3 30.3	246 55.6	255 31.6	-5 15.3	146 26.8	25 25.9
6	268 48.6	3 32.3	277 .5	285 30.8	-5 13.0	176 29.3	25 25.6
8	298 49.0	3 34.2	307 5.4	315 30.0	-5 10.6	206 31.9	25 25.4
10	328 49.4	3 36.2	337 10.4	345 29.2	-5 8.2	236 34.4	25 25.1
12	358 49.8	3 38.1	7 15.3	15 28.4	-5 5.9	266 36.9	25 24.9
14	28 50.1	3 40.0	37 20.2	45 27.6	-5 3.5	296 39.4	25 24.7
16	58 50.5	3 42.0	67 25.2	75 26.8	-5 1.1	326 41.9	25 24.4
18	88 50.9	3 43.9	97 30.1	105 26.0	-4 58.7	356 44.5	25 24.2
20	118 51.3	3 45.9	127 35.0	135 25.2	-4 56.4	26 47.0	25 23.9
22	148 51.6	3 47.8	157 39.9	165 24.4	-4 54.0	56 49.5	25 23.7
Δ	2	10		-4	12	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_☾$	Δ	$\delta_☾$	Δ	$S_♃$	$\delta_♃$	$S_♄$	$\delta_♄$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	278 17.4	97	-27 49.4	12	255 22.2	-21 56.8	31 24.2	12 13.7
2	307 14.8	97	-27 46.9	15	285 26.5	-21 56.7	61 29.4	12 13.8
4	336 12.2	97	-27 43.9	18	315 30.8	-21 56.6	91 34.6	12 13.9
6	5 9.6	97	-27 40.3	21	345 35.1	-21 56.6	121 39.8	12 14.0
8	34 7.0	97	-27 36.2	23	15 39.4	-21 56.5	151 45.0	12 14.1
10	63 4.4	97	-27 31.5	26	45 43.7	-21 56.4	181 50.2	12 14.2
12	92 1.8	97	-27 26.3	29	75 48.0	-21 56.3	211 55.4	12 14.3
14	120 59.3	97	-27 20.5	32	105 52.3	-21 56.3	242 .6	12 14.4
16	149 56.7	98	-27 14.2	34	135 56.6	-21 56.2	272 5.8	12 14.4
18	178 54.2	98	-27 7.3	37	166 .9	-21 56.1	302 11.0	12 14.5
20	207 51.8	98	-26 59.9	40	196 5.2	-21 56.0	332 16.2	12 14.6
22	236 49.4	98	-26 51.9	43	226 9.5	-21 55.9	2 21.4	12 14.7
Δ					21	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 33	18 37	0 43	2 36	3 60	1.1	7 20	3.4
55	5 39	18 32	0 37	2 10	2 49	1.6	8 30	2.9
50	5 43	18 28	0 33	1 53	2 8	1.7	9 11	2.7
45	5 46	18 24	0 30	1 41	1 38	1.8	9 41	2.6
40	5 49	18 22	0 27	1 32	1 15	1.9	10 4	2.5
35	5 51	18 19	0 25	1 26	0 56	2.0	10 22	2.4
30	5 53	18 17	0 24	1 21	0 40	2.0	10 39	2.4
20	5 56	18 14	0 22	1 14	0 12	2.1	11 6	2.3
10	5 59	18 11	0 21	1 10	. . .	.0	11 29	2.2
0	6 1	18 8	0 21	1 9	. . .	.0	11 51	2.1
10	6 4	18 5	0 21	1 10	23 57	2.2	12 13	2.1
20	6 6	18 3	0 22	1 13	23 34	2.3	12 36	2.0
30	6 9	17 60	0 24	1 19	23 8	2.4	13 3	1.9
35	6 11	17 58	0 25	1 24	22 52	2.5	13 19	1.8
40	6 12	17 56	0 27	1 30	22 34	2.6	13 38	1.8
45	6 14	17 54	0 29	1 38	22 12	2.7	13 60	1.7
50	6 16	17 52	0 32	1 48	21 44	2.9	14 28	1.5
55	6 19	17 49	0 36	2 1	21 6	3.1	15 7	1.3
60	6 23	17 45	0 41	2 21	20 3	3.7	16 11	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_☾$	r
h	min s	s	′	h min	min	′	′
00	- 4 49.8	.8	16.0	$T_{\overline{m}}$ 5 39	2.1	54.5	14.8
12	- 4 40.8	$T_{\overline{m}_\odot}$ 12 h 4.7 min		Starost 21.3 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 58	.1	9	-3.8	♃	6 58	.0	69	-2.0
♂	18 13	.1	260	.8	♄	21 51	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	$S_♀$	$\delta_♀$	$S_♂$	$\delta_♂$
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 52.0	3 49.8	187 44.9	195 23.6	-4 51.6	86 52.0	25 23.4
2	208 52.4	3 51.7	217 49.8	225 22.8	-4 49.2	116 54.5	25 23.2
4	238 52.8	3 53.6	247 54.7	255 22.0	-4 46.8	146 57.0	25 23.0
6	268 53.1	3 55.6	277 59.7	285 21.3	-4 44.5	176 59.5	25 22.7
8	298 53.5	3 57.5	308 4.6	315 20.5	-4 42.1	207 2.1	25 22.5
10	328 53.9	3 59.5	338 9.5	345 19.7	-4 39.7	237 4.6	25 22.2
12	358 54.3	4 1.4	8 14.4	15 18.9	-4 37.3	267 7.1	25 22.0
14	28 54.6	4 3.3	38 19.4	45 18.1	-4 34.9	297 9.6	25 21.7
16	58 55.0	4 5.3	68 24.3	75 17.3	-4 32.5	327 12.1	25 21.5
18	88 55.4	4 7.2	98 29.2	105 16.5	-4 30.2	357 14.6	25 21.2
20	118 55.8	4 9.2	128 34.2	135 15.8	-4 27.8	27 17.1	25 21.0
22	148 56.1	4 11.1	158 39.1	165 15.0	-4 25.4	57 19.6	25 20.7
Δ	2	10		-4	12	13	-1

UT	MESEC				JUPITER		SATURN	
	$S_☾$	Δ	$\delta_☾$	Δ	$S_♃$	$\delta_♃$	$S_♄$	$\delta_♄$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 47.1	99	-26 43.4	45	256 13.8	-21 55.9	32 26.6	12 14.8
2	294 44.8	99	-26 34.4	48	286 18.1	-21 55.8	62 31.8	12 14.9
4	323 42.7	99	-26 24.8	51	316 22.4	-21 55.7	92 37.0	12 15.0
6	352 40.5	100	-26 14.6	53	346 26.7	-21 55.6	122 42.2	12 15.1
8	21 38.5	100	-26 4.0	56	16 31.0	-21 55.6	152 47.4	12 15.2
10	50 36.6	101	-25 52.8	59	46 35.3	-21 55.5	182 52.6	12 15.3
12	79 34.8	101	-25 41.1	61	76 39.6	-21 55.4	212 57.8	12 15.4
14	108 33.0	102	-25 28.8	64	106 43.9	-21 55.3	243 2.9	12 15.5
16	137 31.4	102	-25 16.0	66	136 48.2	-21 55.3	273 8.1	12 15.6
18	166 29.9	103	-25 2.7	69	166 52.5	-21 55.2	303 13.3	12 15.7
20	195 28.5	104	-24 48.9	72	196 56.9	-21 55.1	333 18.5	12 15.8
22	224 27.2	104	-24 34.6	74	227 1.2	-21 55.0	3 23.7	12 15.9
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 30	18 40	0 43	2 37	4 25	.5	8 43	3.9
55	5 36	18 34	0 37	2 11	3 26	1.1	9 40	3.3
50	5 40	18 29	0 33	1 54	2 50	1.3	10 16	3.0
45	5 44	18 26	0 30	1 42	2 22	1.5	10 43	2.8
40	5 47	18 23	0 27	1 33	2 1	1.6	11 3	2.7
35	5 49	18 20	0 25	1 26	1 43	1.7	11 21	2.6
30	5 52	18 18	0 24	1 21	1 28	1.8	11 36	2.5
20	5 55	18 14	0 22	1 14	1 2	1.9	12 1	2.3
10	5 58	18 11	0 21	1 10	0 39	2.0	12 23	2.2
0	6 1	18 8	0 21	1 9	0 18	2.1	12 43	2.1
10	6 4	18 5	0 21	1 10	. . .	.0	13 3	2.0
20	6 7	18 2	0 22	1 13	. . .	.0	13 24	1.9
30	6 10	17 59	0 24	1 19	. . .	.0	13 49	1.7
35	6 11	17 57	0 25	1 24	23 53	2.6	14 3	1.6
40	6 13	17 55	0 27	1 30	23 37	2.8	14 20	1.5
45	6 15	17 53	0 29	1 38	23 17	2.9	14 40	1.4
50	6 18	17 50	0 32	1 48	22 53	3.1	15 5	1.2
55	6 21	17 47	0 36	2 1	22 21	3.4	15 38	.9
60	6 25	17 42	0 41	2 20	21 32	4.0	16 28	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_☾$	r
h	min s	s	′	h min	min	′	′
00	- 4 31.8	.7	16.0	$T_{\overline{m}}$ 6 30	2.1	54.9	15.0
12	- 4 22.8	$T_{\overline{m}_\odot}$ 12 h 4.4 min		Starost 22.3 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 59	.1	8	-3.8	♃	6 54	.0	68	-2.0
♂	18 11	.1	259	.8	♄	21 46	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 56.5	4 13.0	188 44.0	195 14.2	- 4 23.0	87 22.1	25 20.5
2	208 56.9	4 15.0	218 48.9	225 13.4	- 4 20.6	117 24.6	25 20.2
4	238 57.3	4 16.9	248 53.9	255 12.6	- 4 18.2	147 27.1	25 20.0
6	268 57.6	4 18.8	278 58.8	285 11.8	- 4 15.8	177 29.5	25 19.7
8	298 58.0	4 20.8	309 3.7	315 11.1	- 4 13.4	207 32.0	25 19.5
10	328 58.4	4 22.7	339 8.7	345 10.3	- 4 11.0	237 34.5	25 19.2
12	358 58.7	4 24.6	9 13.6	15 9.5	- 4 8.6	267 37.0	25 18.9
14	28 59.1	4 26.6	39 18.5	45 8.7	- 4 6.3	297 39.5	25 18.7
16	58 59.5	4 28.5	69 23.4	75 8.0	- 4 3.9	327 42.0	25 18.4
18	88 59.9	4 30.4	99 28.4	105 7.2	- 4 1.5	357 44.5	25 18.2
20	119 .2	4 32.4	129 33.3	135 6.4	- 3 59.1	27 47.0	25 17.9
22	149 .6	4 34.3	159 38.2	165 5.6	- 3 56.7	57 49.4	25 17.7
Δ	2	10		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	253 26.0	105	-24 19.7	77	257 5.5	-21 55.0	33 28.9	12 16.0
2	282 25.0	105	-24 4.4	79	287 9.8	-21 54.9	63 34.1	12 16.1
4	311 24.0	106	-23 48.5	82	317 14.1	-21 54.8	93 39.3	12 16.2
6	340 23.3	107	-23 32.2	84	347 18.4	-21 54.7	123 44.5	12 16.3
8	9 22.6	107	-23 15.3	87	17 22.8	-21 54.7	153 49.7	12 16.3
10	38 22.1	108	-22 58.0	89	47 27.1	-21 54.6	183 54.8	12 16.4
12	67 21.7	109	-22 40.1	92	77 31.4	-21 54.5	214 .0	12 16.5
14	96 21.4	109	-22 21.8	94	107 35.7	-21 54.4	244 5.2	12 16.6
16	125 21.3	110	-22 3.1	96	137 40.1	-21 54.4	274 10.4	12 16.7
18	154 21.3	111	-21 43.8	99	167 44.4	-21 54.3	304 15.6	12 16.8
20	183 21.5	111	-21 24.1	101	197 48.7	-21 54.2	334 20.8	12 16.9
22	212 21.8	112	-21 3.9	103	227 53.0	-21 54.1	4 25.9	12 17.0
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 27	18 42	0 43	2 39	4 36	.2	10 17	4.1
55	5 34	18 36	0 37	2 12	3 52	.7	10 60	3.5
50	5 38	18 31	0 33	1 54	3 22	1.0	11 29	3.2
45	5 42	18 27	0 30	1 42	2 59	1.2	11 51	3.0
40	5 45	18 24	0 27	1 33	2 40	1.4	12 8	2.8
35	5 48	18 21	0 25	1 26	2 25	1.5	12 23	2.7
30	5 50	18 18	0 24	1 21	2 11	1.6	12 36	2.6
20	5 54	18 14	0 22	1 14	1 48	1.8	12 57	2.4
10	5 58	18 11	0 21	1 10	1 28	1.9	13 16	2.2
0	6 1	18 7	0 21	1 9	1 9	2.1	13 33	2.0
10	6 4	18 4	0 21	1 10	0 50	2.2	13 50	1.9
20	6 7	18 1	0 22	1 13	0 30	2.4	14 9	1.7
30	6 10	17 57	0 24	1 19	0 7	2.5	14 30	1.5
35	6 12	17 55	0 25	1 24	. . . .	.0	14 42	1.4
40	6 14	17 53	0 27	1 30	. . . .	.0	14 56	1.3
45	6 17	17 51	0 29	1 37	. . . .	.0	15 12	1.1
50	6 20	17 48	0 32	1 48	. . . .	.0	15 33	.9
55	6 23	17 44	0 36	2 1	23 43	3.6	15 59	.6
60	6 28	17 39	0 41	2 20	23 8	4.1	16 35	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 4 13.8	.7	16.0	$T_{\overline{m}}$ 7 21	2.1	55.5	15.1
12	- 4 4.9	$T_{\overline{m}_\odot}$ 12 h 4.1 min		Starost 23.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 59	.1	6	-3.8	♆	6 51	.0	68	-2.0
♂	18 9	.1	259	.8	♇	21 42	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 1.0	4 36.2	189 43.1	195 4.9	- 3 54.3	87 51.9	25 17.4
2	209 1.3	4 38.1	219 48.1	225 4.1	- 3 51.9	117 54.4	25 17.1
4	239 1.7	4 40.1	249 53.0	255 3.3	- 3 49.5	147 56.9	25 16.9
6	269 2.1	4 42.0	279 57.9	285 2.5	- 3 47.1	177 59.4	25 16.6
8	299 2.5	4 43.9	310 2.9	315 1.8	- 3 44.7	208 1.8	25 16.3
10	329 2.8	4 45.9	340 7.8	345 1.0	- 3 42.3	238 4.3	25 16.1
12	359 3.2	4 47.8	10 12.7	15 .2	- 3 39.9	268 6.8	25 15.8
14	29 3.6	4 49.7	40 17.6	44 59.5	- 3 37.5	298 9.2	25 15.6
16	59 3.9	4 51.6	70 22.6	74 58.7	- 3 35.0	328 11.7	25 15.3
18	89 4.3	4 53.6	100 27.5	104 57.9	- 3 32.6	358 14.2	25 15.0
20	119 4.7	4 55.5	130 32.4	134 57.1	- 3 30.2	28 16.6	25 14.8
22	149 5.0	4 57.4	160 37.4	164 56.4	- 3 27.8	58 19.1	25 14.5
Δ	2	10		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	241 22.2	113	-20 43.2	105	257 57.4	-21 54.1	34 31.1	12 17.1
2	270 22.8	113	-20 22.1	108	288 1.7	-21 54.0	64 36.3	12 17.2
4	299 23.5	114	-20 .6	110	318 6.0	-21 53.9	94 41.5	12 17.3
6	328 24.3	115	-19 38.6	112	348 10.4	-21 53.8	124 46.7	12 17.4
8	357 25.2	115	-19 16.2	114	18 14.7	-21 53.8	154 51.9	12 17.4
10	26 26.3	116	-18 53.4	116	48 19.0	-21 53.7	184 57.0	12 17.5
12	55 27.5	117	-18 30.1	118	78 23.4	-21 53.6	215 2.2	12 17.6
14	84 28.9	117	-18 6.4	120	108 27.7	-21 53.5	245 7.4	12 17.7
16	113 30.3	118	-17 42.3	122	138 32.0	-21 53.5	275 12.6	12 17.8
18	142 31.9	118	-17 17.8	124	168 36.4	-21 53.4	305 17.7	12 17.9
20	171 33.6	119	-16 52.9	126	198 40.7	-21 53.3	335 22.9	12 18.0
22	200 35.4	119	-16 27.7	128	228 45.1	-21 53.3	5 28.1	12 18.1
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 24	18 45	0 43	2 41	4 41	.1	11 55	4.1
55	5 31	18 38	0 37	2 12	4 9	.5	12 24	3.6
50	5 36	18 32	0 33	1 55	3 46	.8	12 46	3.3
45	5 40	18 28	0 30	1 42	3 28	1.0	13 2	3.1
40	5 44	18 25	0 27	1 33	3 13	1.2	13 16	2.9
35	5 47	18 22	0 26	1 26	3 1	1.3	13 27	2.7
30	5 49	18 19	0 24	1 21	2 50	1.5	13 37	2.6
20	5 53	18 14	0 22	1 14	2 31	1.7	13 54	2.4
10	5 57	18 11	0 21	1 10	2 14	1.9	14 9	2.2
0	6 1	18 7	0 21	1 9	1 59	2.0	14 22	2.0
10	6 4	18 4	0 21	1 10	1 43	2.2	14 36	1.8
20	6 7	18 0	0 22	1 13	1 27	2.4	14 50	1.6
30	6 11	17 56	0 24	1 19	1 7	2.6	15 7	1.4
35	6 13	17 54	0 25	1 24	0 56	2.7	15 16	1.3
40	6 15	17 52	0 27	1 30	0 43	2.9	15 27	1.1
45	6 18	17 49	0 29	1 37	0 28	3.0	15 39	1.0
50	6 21	17 46	0 32	1 47	0 9	3.3	15 54	.7
55	6 25	17 42	0 36	2 1	. . . .	.0	16 13	.5
60	6 30	17 36	0 41	2 20	. . . .	.0	16 39	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 3 55.9	.7	16.0	$T_{\overline{m}}$ 8 11	2.0	56.3	15.3
12	- 3 47.0	$T_{\overline{m}_\odot}$ 12 h 3.8 min		Starost 24.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	10 60	.1	5	-3.8	♆	6 47	.0	68	-2.0
♂	18 7	.1	258	.8	♇	21 38	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 5.4	4 59.3	190 42.3	194 55.6	- 3 25.4	88 21.6	25 14.2
2	209 5.8	5 1.2	220 47.2	224 54.8	- 3 23.0	118 24.0	25 13.9
4	239 6.1	5 3.2	250 52.1	254 54.1	- 3 20.6	148 26.5	25 13.7
6	269 6.5	5 5.1	280 57.1	284 53.3	- 3 18.2	178 29.0	25 13.4
8	299 6.9	5 7.0	311 2.0	314 52.5	- 3 15.8	208 31.4	25 13.1
10	329 7.2	5 8.9	341 6.9	344 51.8	- 3 13.4	238 33.9	25 12.9
12	359 7.6	5 10.8	11 11.9	14 51.0	- 3 11.0	268 36.3	25 12.6
14	29 8.0	5 12.8	41 16.8	44 50.3	- 3 8.5	298 38.8	25 12.3
16	59 8.3	5 14.7	71 21.7	74 49.5	- 3 6.1	328 41.2	25 12.0
18	89 8.7	5 16.6	101 26.6	104 48.7	- 3 3.7	358 43.7	25 11.8
20	119 9.1	5 18.5	131 31.6	134 48.0	- 3 1.3	28 46.1	25 11.5
22	149 9.4	5 20.4	161 36.5	164 47.2	- 2 58.9	58 48.6	25 11.2
Δ	2	10		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	229 37.3	120	-16 2.0	130	258 49.4	-21 53.2	35 33.3	12 18.2
2	258 39.3	120	-15 35.9	132	288 53.8	-21 53.1	65 38.5	12 18.2
4	287 41.4	121	-15 9.5	134	318 58.1	-21 53.0	95 43.6	12 18.3
6	316 43.5	121	-14 42.8	136	349 2.4	-21 53.0	125 48.8	12 18.4
8	345 45.8	122	-14 15.6	137	19 6.8	-21 52.9	155 54.0	12 18.5
10	14 48.2	122	-13 48.2	139	49 11.1	-21 52.8	185 59.1	12 18.6
12	43 50.6	122	-13 20.4	141	79 15.5	-21 52.8	216 4.3	12 18.7
14	72 53.1	123	-12 52.2	142	109 19.8	-21 52.7	246 9.5	12 18.8
16	101 55.6	123	-12 23.8	144	139 24.2	-21 52.6	276 14.7	12 18.9
18	130 58.2	123	-11 55.0	145	169 28.5	-21 52.5	306 19.8	12 18.9
20	160 .9	123	-11 25.9	147	199 32.9	-21 52.5	336 25.0	12 19.0
22	189 3.6	124	-10 56.5	148	229 37.3	-21 52.4	6 30.2	12 19.1
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 21	18 47	0 43	2 42	4 43	.0	13 32	4.0
55	5 29	18 40	0 37	2 13	4 22	.4	13 51	3.6
50	5 34	18 34	0 33	1 55	4 6	.7	14 5	3.3
45	5 38	18 29	0 30	1 43	3 53	.9	14 16	3.1
40	5 42	18 26	0 27	1 33	3 42	1.1	14 25	2.9
35	5 45	18 22	0 26	1 26	3 33	1.2	14 32	2.8
30	5 48	18 20	0 24	1 21	3 25	1.4	14 39	2.6
20	5 53	18 15	0 22	1 14	3 11	1.6	14 51	2.4
10	5 57	18 11	0 21	1 10	2 59	1.8	15 1	2.2
0	6 0	18 7	0 21	1 9	2 47	2.0	15 10	2.0
10	6 4	18 3	0 21	1 10	2 36	2.2	15 19	1.8
20	6 7	17 59	0 22	1 13	2 24	2.4	15 29	1.6
30	6 11	17 55	0 24	1 19	2 9	2.6	15 40	1.3
35	6 14	17 53	0 25	1 24	2 1	2.7	15 47	1.2
40	6 16	17 50	0 27	1 30	1 52	2.9	15 54	1.0
45	6 19	17 47	0 29	1 37	1 41	3.1	16 2	.9
50	6 23	17 43	0 32	1 47	1 27	3.3	16 12	.6
55	6 27	17 39	0 36	2 1	1 10	3.6	16 25	.4
60	6 32	17 33	0 41	2 19	0 47	4.0	16 40	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 3 38.2	.7	16.0	$T_{\overline{m}}$	8 59	2.0	57.1	15.6
12	- 3 29.4	$T_{\overline{m}_\odot}$	12 h 3.5 min	Starost 25.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 1	.1	4	-3.8	♃	6 44	.0	68	-2.0
♂	18 5	.1	258	.8	♄	21 34	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 9.8	5 22.3	191 41.4	194 46.5	- 2 56.5	88 51.0	25 10.9
2	209 10.2	5 24.3	221 46.4	224 45.7	- 2 54.1	118 53.5	25 10.7
4	239 10.5	5 26.2	251 51.3	254 44.9	- 2 51.6	148 55.9	25 10.4
6	269 10.9	5 28.1	281 56.2	284 44.2	- 2 49.2	178 58.4	25 10.1
8	299 11.3	5 30.0	312 1.1	314 43.4	- 2 46.8	209 .8	25 9.8
10	329 11.6	5 31.9	342 6.1	344 42.7	- 2 44.4	239 3.3	25 9.5
12	359 12.0	5 33.8	12 11.0	14 41.9	- 2 42.0	269 5.7	25 9.3
14	29 12.4	5 35.7	42 15.9	44 41.1	- 2 39.5	299 8.1	25 9.0
16	59 12.7	5 37.6	72 20.9	74 40.4	- 2 37.1	329 10.6	25 8.7
18	89 13.1	5 39.5	102 25.8	104 39.6	- 2 34.7	359 13.0	25 8.4
20	119 13.4	5 41.5	132 30.7	134 38.9	- 2 32.3	29 15.4	25 8.1
22	149 13.8	5 43.4	162 35.6	164 38.1	- 2 29.9	59 17.9	25 7.8
Δ	2	10		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	218 6.3	124	-10 26.8	150	259 41.6	-21 52.3	36 35.3	12 19.2
2	247 9.1	124	- 9 56.9	151	289 46.0	-21 52.3	66 40.5	12 19.3
4	276 11.8	124	- 9 26.6	152	319 50.3	-21 52.2	96 45.7	12 19.4
6	305 14.6	124	- 8 56.1	154	349 54.7	-21 52.1	126 50.9	12 19.5
8	334 17.4	124	- 8 25.4	155	19 59.1	-21 52.0	156 56.0	12 19.5
10	3 20.2	124	- 7 54.4	156	50 3.4	-21 52.0	187 1.2	12 19.6
12	32 23.0	124	- 7 23.2	157	80 7.8	-21 51.9	217 6.4	12 19.7
14	61 25.8	124	- 6 51.7	158	110 12.1	-21 51.8	247 11.5	12 19.8
16	90 28.5	124	- 6 20.0	159	140 16.5	-21 51.8	277 16.7	12 19.9
18	119 31.2	123	- 5 48.1	160	170 20.9	-21 51.7	307 21.8	12 20.0
20	148 33.9	123	- 5 16.1	161	200 25.2	-21 51.6	337 27.0	12 20.0
22	177 36.5	123	- 4 43.8	162	230 29.6	-21 51.6	7 32.2	12 20.1
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 18	18 50	0 44	2 44	4 44	.0	15 9	4.1
55	5 26	18 42	0 37	2 14	4 32	.4	15 18	3.7
50	5 32	18 36	0 33	1 56	4 22	.6	15 25	3.4
45	5 37	18 31	0 30	1 43	4 15	.8	15 30	3.2
40	5 40	18 27	0 27	1 34	4 8	1.0	15 35	3.0
35	5 44	18 23	0 26	1 27	4 3	1.2	15 39	2.8
30	5 47	18 20	0 24	1 21	3 58	1.3	15 42	2.7
20	5 52	18 15	0 22	1 14	3 49	1.6	15 48	2.4
10	5 56	18 11	0 21	1 10	3 42	1.8	15 53	2.2
0	5 60	18 6	0 21	1 9	3 35	2.0	15 57	2.0
10	6 4	18 3	0 21	1 10	3 28	2.2	16 2	1.8
20	6 8	17 58	0 22	1 13	3 20	2.4	16 7	1.6
30	6 12	17 54	0 24	1 19	3 12	2.6	16 12	1.3
35	6 15	17 51	0 25	1 24	3 7	2.8	16 16	1.2
40	6 17	17 48	0 27	1 30	3 1	3.0	16 19	1.0
45	6 21	17 45	0 29	1 37	2 55	3.1	16 23	.8
50	6 24	17 41	0 32	1 47	2 47	3.4	16 28	.6
55	6 29	17 37	0 36	2 1	2 37	3.7	16 34	.4
60	6 35	17 30	0 41	2 19	2 24	4.1	16 41	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 3 20.6	.7	16.0	$T_{\overline{m}}$	9 46	2.0	58.0	15.8
12	- 3 11.8	$T_{\overline{m}_\odot}$	12 h 3.2 min	Starost 26.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 1	.1	3	-3.8	♃	6 40	.0	68	-2.0
♂	18 3	.1	257	.8	♄	21 30	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 14.2	5 45.3	192 40.6	194 37.4	- 2 27.4	89 20.3	25 7.6
2	209 14.5	5 47.2	222 45.5	224 36.6	- 2 25.0	119 22.7	25 7.3
4	239 14.9	5 49.1	252 50.4	254 35.9	- 2 22.6	149 25.2	25 7.0
6	269 15.3	5 51.0	282 55.3	284 35.1	- 2 20.2	179 27.6	25 6.7
8	299 15.6	5 52.9	313 .3	314 34.4	- 2 17.7	209 30.0	25 6.4
10	329 16.0	5 54.8	343 5.2	344 33.6	- 2 15.3	239 32.5	25 6.1
12	359 16.3	5 56.7	13 10.1	14 32.9	- 2 12.9	269 34.9	25 5.8
14	29 16.7	5 58.6	43 15.1	44 32.1	- 2 10.5	299 37.3	25 5.5
16	59 17.1	6 .5	73 20.0	74 31.4	- 2 8.0	329 39.7	25 5.3
18	89 17.4	6 2.4	103 24.9	104 30.6	- 2 5.6	359 42.1	25 5.0
20	119 17.8	6 4.3	133 29.8	134 29.8	- 2 3.2	29 44.6	25 4.7
22	149 18.1	6 6.2	163 34.8	164 29.1	- 2 .7	59 47.0	25 4.4
Δ	2	10		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	206 39.0	122	- 4 11.4	163	260 34.0	-21 51.5	37 37.3	12 20.2
2	235 41.5	122	- 3 38.8	164	290 38.4	-21 51.4	67 42.5	12 20.3
4	264 43.9	122	- 3 6.0	164	320 42.7	-21 51.3	97 47.7	12 20.4
6	293 46.2	121	- 2 33.2	165	350 47.1	-21 51.3	127 52.8	12 20.5
8	322 48.4	120	- 2 .1	166	20 51.5	-21 51.2	157 58.0	12 20.5
10	351 50.5	120	- 1 27.0	166	50 55.9	-21 51.1	188 3.1	12 20.6
12	20 52.4	119	- 0 53.8	167	81 .2	-21 51.1	218 8.3	12 20.7
14	49 54.3	119	- 0 20.4	167	111 4.6	-21 51.0	248 13.5	12 20.8
16	78 56.0	118	0 13.0	167	141 9.0	-21 50.9	278 18.6	12 20.9
18	107 57.6	117	0 46.5	168	171 13.4	-21 50.9	308 23.8	12 20.9
20	136 59.0	116	1 20.0	168	201 17.8	-21 50.8	338 28.9	12 21.0
22	166 .2	115	1 53.6	168	231 22.1	-21 50.7	8 34.1	12 21.1
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 15	18 52	0 44	2 46	4 44	.0	16 47	4.2
55	5 23	18 44	0 38	2 15	4 40	.4	16 47	3.8
50	5 30	18 37	0 33	1 56	4 37	.6	16 47	3.5
45	5 35	18 32	0 30	1 43	4 35	.8	16 47	3.3
40	5 39	18 28	0 27	1 34	4 33	1.0	16 46	3.1
35	5 42	18 24	0 26	1 27	4 31	1.2	16 46	2.9
30	5 46	18 21	0 24	1 21	4 30	1.3	16 46	2.8
20	5 51	18 15	0 22	1 14	4 27	1.6	16 46	2.5
10	5 55	18 11	0 21	1 10	4 25	1.8	16 45	2.3
0	5 60	18 6	0 21	1 9	4 22	2.0	16 45	2.1
10	6 4	18 2	0 21	1 10	4 20	2.2	16 45	1.8
20	6 8	17 58	0 22	1 13	4 18	2.5	16 44	1.6
30	6 13	17 53	0 24	1 19	4 15	2.7	16 44	1.4
35	6 15	17 50	0 25	1 24	4 14	2.9	16 44	1.2
40	6 18	17 47	0 27	1 30	4 12	3.0	16 43	1.1
45	6 22	17 43	0 29	1 37	4 10	3.2	16 43	.9
50	6 26	17 39	0 32	1 47	4 8	3.5	16 43	.6
55	6 31	17 34	0 36	2 1	4 5	3.8	16 42	.4
60	6 37	17 27	0 42	2 19	4 1	4.2	16 41	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 3 3.1	.7	16.0	$T_{\overline{m}}$	10 34	2.0	58.9	16.0
12	- 2 54.5	$T_{\overline{m}_\odot}$ 12 h 2.9 min		Starost 27.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 2	.1	2	-3.8	♃	6 37	.0	68	-2.0
♂	18 1	.1	257	.9	♄	21 26	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 18.5	6 8.1	193 39.7	194 28.3	- 1 58.3	89 49.4	25 4.1
2	209 18.8	6 10.0	223 44.6	224 27.6	- 1 55.9	119 51.8	25 3.8
4	239 19.2	6 11.9	253 49.6	254 26.9	- 1 53.5	149 54.2	25 3.5
6	269 19.6	6 13.8	283 54.5	284 26.1	- 1 51.0	179 56.6	25 3.2
8	299 19.9	6 15.7	313 59.4	314 25.4	- 1 48.6	209 59.1	25 2.9
10	329 20.3	6 17.6	344 4.3	344 24.6	- 1 46.2	240 1.5	25 2.6
12	359 20.6	6 19.5	14 9.3	14 23.9	- 1 43.7	270 3.9	25 2.3
14	29 21.0	6 21.4	44 14.2	44 23.1	- 1 41.3	300 6.3	25 2.0
16	59 21.3	6 23.3	74 19.1	74 22.4	- 1 38.9	330 8.7	25 1.7
18	89 21.7	6 25.2	104 24.1	104 21.6	- 1 36.4	0 11.1	25 1.4
20	119 22.1	6 27.0	134 29.0	134 20.9	- 1 34.0	30 13.5	25 1.1
22	149 22.4	6 28.9	164 33.9	164 20.1	- 1 31.6	60 15.9	25 .8
Δ	2	9		-4	12	12	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 1.3	114	2 27.2	168	261 26.5	-21 50.7	38 39.2	12 21.2
2	224 2.2	113	3 .8	168	291 30.9	-21 50.6	68 44.4	12 21.3
4	253 2.9	112	3 34.5	168	321 35.3	-21 50.5	98 49.6	12 21.3
6	282 3.4	111	4 8.1	168	351 39.7	-21 50.5	128 54.7	12 21.4
8	311 3.7	110	4 41.7	168	21 44.1	-21 50.4	158 59.9	12 21.5
10	340 3.7	109	5 15.2	168	51 48.5	-21 50.3	189 5.0	12 21.6
12	9 3.5	108	5 48.7	167	81 52.9	-21 50.3	219 10.2	12 21.7
14	38 3.1	107	6 22.2	167	111 57.2	-21 50.2	249 15.3	12 21.7
16	67 2.4	105	6 55.5	166	142 1.6	-21 50.1	279 20.5	12 21.8
18	96 1.5	104	7 28.8	166	172 6.0	-21 50.1	309 25.6	12 21.9
20	125 .3	103	8 1.9	165	202 10.4	-21 50.0	339 30.8	12 22.0
22	153 58.8	101	8 34.9	164	232 14.8	-21 49.9	9 35.9	12 22.0
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 12	18 54	0 44	2 48	4 45	.0	18 29	4.4
55	5 21	18 46	0 38	2 16	4 49	.4	18 19	4.0
50	5 28	18 39	0 33	1 57	4 52	.7	18 11	3.7
45	5 33	18 33	0 30	1 44	4 55	.9	18 5	3.4
40	5 37	18 29	0 28	1 34	4 58	1.1	18 0	3.2
35	5 41	18 25	0 26	1 27	4 60	1.3	17 56	3.0
30	5 44	18 21	0 24	1 22	5 2	1.4	17 52	2.9
20	5 50	18 16	0 22	1 14	5 5	1.7	17 46	2.6
10	5 55	18 11	0 21	1 10	5 8	1.9	17 40	2.4
0	5 59	18 6	0 21	1 9	5 11	2.1	17 34	2.2
10	6 4	18 1	0 21	1 10	5 14	2.3	17 29	2.0
20	6 8	17 57	0 22	1 13	5 17	2.6	17 23	1.7
30	6 13	17 52	0 24	1 19	5 20	2.8	17 17	1.5
35	6 16	17 49	0 25	1 24	5 22	3.0	17 13	1.3
40	6 19	17 45	0 27	1 30	5 25	3.1	17 9	1.2
45	6 23	17 42	0 29	1 37	5 28	3.4	17 4	1.0
50	6 27	17 37	0 32	1 47	5 31	3.6	16 58	.7
55	6 33	17 32	0 36	2 1	5 35	3.9	16 51	.4
60	6 40	17 25	0 42	2 19	5 41	4.3	16 42	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 2 45.9	.7	16.0	$T_{\overline{m}}$	11 23	2.1	59.7	16.3
12	- 2 37.3	$T_{\overline{m}_\odot}$ 12 h 2.6 min		Starost 28.3 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 2	.1	1	-3.8	♃	6 33	.0	68	-2.0
♂	17 59	.1	256	.9	♄	21 22	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 22.8	6 30.8	194 38.8	194 19.4	- 1 29.1	90 18.3	25 .5
2	209 23.1	6 32.7	224 43.8	224 18.6	- 1 26.7	120 20.7	25 .2
4	239 23.5	6 34.6	254 48.7	254 17.9	- 1 24.3	150 23.1	24 59.9
6	269 23.8	6 36.5	284 53.6	284 17.2	- 1 21.8	180 25.5	24 59.6
8	299 24.2	6 38.4	314 58.6	314 16.4	- 1 19.4	210 27.9	24 59.3
10	329 24.5	6 40.3	345 3.5	344 15.7	- 1 16.9	240 30.3	24 59.0
12	359 24.9	6 42.1	15 8.4	14 14.9	- 1 14.5	270 32.7	24 58.7
14	29 25.2	6 44.0	45 13.3	44 14.2	- 1 12.1	300 35.1	24 58.3
16	59 25.6	6 45.9	75 18.3	74 13.4	- 1 9.6	330 37.5	24 58.0
18	89 25.9	6 47.8	105 23.2	104 12.7	- 1 7.2	0 39.9	24 57.7
20	119 26.3	6 49.7	135 28.1	134 12.0	- 1 4.8	30 42.3	24 57.4
22	149 26.6	6 51.6	165 33.1	164 11.2	- 1 2.3	60 44.7	24 57.1
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	182 57.1	100	9 7.8	164	262 19.2	-21 49.9	39 41.1	12 22.1
2	211 55.0	98	9 40.5	163	292 23.6	-21 49.8	69 46.2	12 22.2
4	240 52.6	97	10 13.0	162	322 28.0	-21 49.7	99 51.4	12 22.3
6	269 50.0	95	10 45.3	161	352 32.4	-21 49.7	129 56.5	12 22.3
8	298 47.0	93	11 17.5	160	22 36.8	-21 49.6	160 1.7	12 22.4
10	327 43.6	92	11 49.4	158	52 41.2	-21 49.5	190 6.8	12 22.5
12	356 40.0	90	12 21.0	157	82 45.6	-21 49.5	220 11.9	12 22.6
14	25 35.9	88	12 52.4	156	112 50.0	-21 49.4	250 17.1	12 22.6
16	54 31.6	86	13 23.6	154	142 54.5	-21 49.3	280 22.2	12 22.7
18	83 26.9	85	13 54.4	153	172 58.9	-21 49.3	310 27.4	12 22.8
20	112 21.8	83	14 24.9	151	203 3.3	-21 49.2	340 32.5	12 22.9
22	141 16.3	81	14 55.1	149	233 7.7	-21 49.1	10 37.7	12 22.9
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 9	18 57	0 44	2 50	4 46	.1	20 15	4.7
55	5 18	18 47	0 38	2 17	4 59	.5	19 55	4.1
50	5 25	18 40	0 33	1 57	5 9	.8	19 39	3.8
45	5 31	18 34	0 30	1 44	5 17	1.1	19 27	3.5
40	5 36	18 30	0 28	1 34	5 24	1.3	19 17	3.3
35	5 40	18 26	0 26	1 27	5 30	1.4	19 9	3.1
30	5 43	18 22	0 24	1 22	5 36	1.6	19 1	3.0
20	5 49	18 16	0 22	1 14	5 45	1.8	18 48	2.7
10	5 54	18 10	0 21	1 11	5 53	2.0	18 37	2.5
0	5 59	18 6	0 21	1 9	6 1	2.3	18 26	2.3
10	6 4	18 1	0 21	1 10	6 9	2.5	18 16	2.1
20	6 9	17 56	0 22	1 13	6 18	2.7	18 5	1.9
30	6 14	17 50	0 24	1 19	6 28	2.9	17 52	1.7
35	6 17	17 47	0 25	1 24	6 34	3.1	17 45	1.5
40	6 20	17 44	0 27	1 30	6 40	3.3	17 37	1.4
45	6 24	17 40	0 29	1 37	6 48	3.5	17 27	1.2
50	6 29	17 35	0 32	1 47	6 58	3.7	17 16	.9
55	6 35	17 29	0 36	2 0	7 9	4.1	17 1	.6
60	6 42	17 22	0 42	2 19	7 25	4.6	16 43	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 2 28.8	.7	16.0	$T_{\overline{m}}$ 12 14	2.3	60.3	16.4
12	- 2 20.3	$T_{\overline{m}_\odot}$ 12 h	2.3 min	Starost 29.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 3	.1	360	-3.8	♄	6 30	.0	68	-2.0
♂	17 57	.1	256	.9	♇	21 18	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 27.0	6 53.4	195 38.0	194 10.5	- 0 59.9	90 47.0	24 56.8
2	209 27.3	6 55.3	225 42.9	224 9.7	- 0 57.4	120 49.4	24 56.5
4	239 27.7	6 57.2	255 47.8	254 9.0	- 0 55.0	150 51.8	24 56.2
6	269 28.0	6 59.1	285 52.8	284 8.3	- 0 52.6	180 54.2	24 55.9
8	299 28.4	7 .9	315 57.7	314 7.5	- 0 50.1	210 56.6	24 55.5
10	329 28.7	7 2.8	346 2.6	344 6.8	- 0 47.7	240 59.0	24 55.2
12	359 29.1	7 4.7	16 7.6	14 6.0	- 0 45.2	271 1.3	24 54.9
14	29 29.4	7 6.6	46 12.5	44 5.3	- 0 42.8	301 3.7	24 54.6
16	59 29.8	7 8.4	76 17.4	74 4.6	- 0 40.4	331 6.1	24 54.3
18	89 30.1	7 10.3	106 22.3	104 3.8	- 0 37.9	1 8.5	24 53.9
20	119 30.5	7 12.2	136 27.3	134 3.1	- 0 35.5	31 10.9	24 53.6
22	149 30.8	7 14.1	166 32.2	164 2.3	- 0 33.0	61 13.2	24 53.3
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	170 10.5	79	15 25.0	148	263 12.1	-21 49.1	40 42.8	12 23.0
2	199 4.3	77	15 54.5	146	293 16.5	-21 49.0	70 47.9	12 23.1
4	227 57.7	75	16 23.6	144	323 20.9	-21 49.0	100 53.1	12 23.2
6	256 50.8	73	16 52.3	142	353 25.3	-21 48.9	130 58.2	12 23.2
8	285 43.4	71	17 20.6	139	23 29.8	-21 48.8	161 3.4	12 23.3
10	314 35.7	69	17 48.5	137	53 34.2	-21 48.8	191 8.5	12 23.4
12	343 27.5	67	18 16.0	135	83 38.6	-21 48.7	221 13.6	12 23.5
14	12 19.0	65	18 43.0	133	113 43.0	-21 48.6	251 18.8	12 23.5
16	41 10.1	63	19 9.5	130	143 47.4	-21 48.6	281 23.9	12 23.6
18	70 .7	61	19 35.5	127	173 51.9	-21 48.5	311 29.1	12 23.7
20	98 51.0	59	20 1.0	125	203 56.3	-21 48.4	341 34.2	12 23.7
22	127 40.9	58	20 25.9	122	234 .7	-21 48.4	11 39.3	12 23.8
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 6	18 59	0 44	2 52	4 48	.2	22 8	4.8
55	5 16	18 49	0 38	2 18	5 11	.7	21 34	4.1
50	5 23	18 42	0 33	1 58	5 29	1.1	21 10	3.8
45	5 29	18 36	0 30	1 44	5 43	1.3	20 52	3.5
40	5 34	18 31	0 28	1 35	5 55	1.5	20 37	3.3
35	5 38	18 26	0 26	1 27	6 5	1.7	20 24	3.2
30	5 42	18 23	0 24	1 22	6 14	1.8	20 13	3.1
20	5 48	18 16	0 22	1 15	6 29	2.0	19 54	2.8
10	5 54	18 10	0 21	1 11	6 43	2.2	19 38	2.7
0	5 59	18 5	0 21	1 9	6 55	2.4	19 22	2.5
10	6 4	18 0	0 21	1 10	7 8	2.6	19 7	2.3
20	6 9	17 55	0 22	1 13	7 22	2.8	18 51	2.2
30	6 14	17 49	0 24	1 19	7 38	3.0	18 33	2.0
35	6 18	17 46	0 25	1 24	7 48	3.2	18 22	1.8
40	6 21	17 42	0 27	1 30	7 59	3.3	18 10	1.7
45	6 26	17 38	0 29	1 37	8 12	3.5	17 55	1.5
50	6 30	17 33	0 32	1 47	8 27	3.8	17 38	1.2
55	6 37	17 27	0 36	2 0	8 48	4.2	17 16	.9
60	6 44	17 19	0 42	2 19	9 16	4.8	16 45	.3
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 2 11.9	.7	16.0	$T_{\overline{m}}$ 13 9	2.5	60.6	16.5
12	- 2 3.6	$T_{\overline{m}_\odot}$ 12 h	2.1 min	Starost .8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 4	.1	359	-3.8	♄	6 26	.0	68	-2.0
♂	17 55	.1	255	.9	♇	21 14	.0	205	.4

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UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 31.1	7 15.9	196 37.1	194 1.6	− 0 30.6	91 15.6	24 53.0
2	209 31.5	7 17.8	226 42.0	224 .9	− 0 28.2	121 18.0	24 52.7
4	239 31.8	7 19.7	256 47.0	254 .1	− 0 25.7	151 20.4	24 52.3
6	269 32.2	7 21.5	286 51.9	283 59.4	− 0 23.3	181 22.7	24 52.0
8	299 32.5	7 23.4	316 56.8	313 58.6	− 0 20.8	211 25.1	24 51.7
10	329 32.9	7 25.3	347 1.8	343 57.9	− 0 18.4	241 27.5	24 51.4
12	359 33.2	7 27.1	17 6.7	13 57.2	− 0 15.9	271 29.8	24 51.0
14	29 33.5	7 29.0	47 11.6	43 56.4	− 0 13.5	301 32.2	24 50.7
16	59 33.9	7 30.8	77 16.5	73 55.7	− 0 11.0	331 34.6	24 50.4
18	89 34.2	7 32.7	107 21.5	103 55.0	− 0 8.6	1 36.9	24 50.1
20	119 34.6	7 34.6	137 26.4	133 54.2	− 0 6.2	31 39.3	24 49.7
22	149 34.9	7 36.4	167 31.3	163 53.5	− 0 3.7	61 41.7	24 49.4
Δ	2	9		−4	12	12	−2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	156 30.4	56	20 50.3	119	264 5.1	−21 48.3	41 44.5	12 23.9
2	185 19.5	54	21 14.2	116	294 9.6	−21 48.3	71 49.6	12 24.0
4	214 8.2	52	21 37.5	113	324 14.0	−21 48.2	101 54.7	12 24.0
6	242 56.6	50	22 .2	110	354 18.4	−21 48.1	131 59.9	12 24.1
8	271 44.6	48	22 22.3	107	24 22.9	−21 48.1	162 5.0	12 24.2
10	300 32.2	46	22 43.7	104	54 27.3	−21 48.0	192 10.1	12 24.2
12	329 19.5	45	23 4.6	101	84 31.7	−21 48.0	222 15.2	12 24.3
14	358 6.4	43	23 24.8	98	114 36.2	−21 47.9	252 20.4	12 24.4
16	26 53.0	41	23 44.3	94	144 40.6	−21 47.8	282 25.5	12 24.4
18	55 39.2	40	24 3.1	91	174 45.0	−21 47.8	312 30.6	12 24.5
20	84 25.2	38	24 21.3	87	204 49.5	−21 47.7	342 35.8	12 24.6
22	113 10.8	37	24 38.7	84	234 53.9	−21 47.6	12 40.9	12 24.6
Δ					22	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 3	19 2	0 45	2 55	4 53	.5	.. ..	.0
55	5 13	18 51	0 38	2 19	5 29	1.1	23 14	3.7
50	5 21	18 43	0 34	1 59	5 54	1.5	22 41	3.5
45	5 27	18 37	0 30	1 45	6 14	1.7	22 16	3.3
40	5 33	18 32	0 28	1 35	6 31	1.9	21 57	3.2
35	5 37	18 27	0 26	1 28	6 45	2.0	21 40	3.1
30	5 41	18 23	0 24	1 22	6 57	2.1	21 26	3.0
20	5 48	18 16	0 22	1 15	7 18	2.3	21 2	2.9
10	5 53	18 10	0 21	1 11	7 36	2.4	20 42	2.7
0	5 58	18 5	0 21	1 9	7 53	2.6	20 23	2.6
10	6 4	17 60	0 21	1 10	8 11	2.7	20 3	2.5
20	6 9	17 54	0 22	1 13	8 30	2.9	19 43	2.4
30	6 15	17 48	0 24	1 19	8 51	3.0	19 19	2.3
35	6 19	17 45	0 25	1 24	9 4	3.1	19 6	2.2
40	6 22	17 41	0 27	1 30	9 19	3.3	18 50	2.1
45	6 27	17 36	0 29	1 37	9 37	3.4	18 31	1.9
50	6 32	17 31	0 32	1 47	9 59	3.7	18 8	1.7
55	6 38	17 24	0 36	2 0	10 28	4.0	17 37	1.4
60	6 47	17 16	0 42	2 19	11 12	4.8	16 52	.7
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 1 55.3	.7	16.0	$T_{\overline{m}}$ 14 8	2.6	60.7	16.5
12	− 1 47.0	$T_{\overline{m}_\odot}$ 12 h	1.8 min	Starost 1.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 4	.1	357	−3.8	♃	6 23	.0	67	−2.0
♂	17 54	.1	255	.9	♄	21 9	.0	205	.4

9. APRIL SREDA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 35.2	7 38.3	197 36.3	193 52.8	− 0 1.3	91 44.0	24 49.1
2	209 35.6	7 40.1	227 41.2	223 52.0	0 1.2	121 46.4	24 48.7
4	239 35.9	7 42.0	257 46.1	253 51.3	0 3.6	151 48.7	24 48.4
6	269 36.3	7 43.9	287 51.0	283 50.5	0 6.1	181 51.1	24 48.1
8	299 36.6	7 45.7	317 56.0	313 49.8	0 8.5	211 53.4	24 47.7
10	329 36.9	7 47.6	348 .9	343 49.1	0 10.9	241 55.8	24 47.4
12	359 37.3	7 49.4	18 5.8	13 48.3	0 13.4	271 58.2	24 47.1
14	29 37.6	7 51.3	48 10.8	43 47.6	0 15.8	302 .5	24 46.7
16	59 37.9	7 53.1	78 15.7	73 46.9	0 18.3	332 2.9	24 46.4
18	89 38.3	7 55.0	108 20.6	103 46.1	0 20.7	2 5.2	24 46.1
20	119 38.6	7 56.8	138 25.5	133 45.4	0 23.2	32 7.6	24 45.7
22	149 38.9	7 58.7	168 30.5	163 44.7	0 25.6	62 9.9	24 45.4
Δ	2	9		−4	12	12	−2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	141 56.2	35	24 55.5	80	264 58.4	−21 47.6	42 46.0	12 24.7
2	170 41.2	34	25 11.5	76	295 2.8	−21 47.5	72 51.1	12 24.8
4	199 26.0	33	25 26.8	73	325 7.2	−21 47.5	102 56.3	12 24.8
6	228 10.6	32	25 41.3	69	355 11.7	−21 47.4	133 1.4	12 24.9
8	256 54.9	31	25 55.1	65	25 16.1	−21 47.3	163 6.5	12 25.0
10	285 39.0	30	26 8.1	61	55 20.6	−21 47.3	193 11.6	12 25.0
12	314 23.0	29	26 20.4	57	85 25.0	−21 47.2	223 16.8	12 25.1
14	343 6.7	28	26 31.8	54	115 29.5	−21 47.2	253 21.9	12 25.2
16	11 50.3	27	26 42.5	50	145 33.9	−21 47.1	283 27.0	12 25.2
18	40 33.8	27	26 52.4	46	175 38.4	−21 47.0	313 32.1	12 25.3
20	69 17.1	26	27 1.6	42	205 42.8	−21 47.0	343 37.3	12 25.4
22	98 .4	26	27 9.9	38	235 47.3	−21 46.9	13 42.4	12 25.4
Δ					22	0	26	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 0	19 4	0 45	2 58	5 4	1.2	0 5	4.4
55	5 11	18 53	0 38	2 20	5 56	1.8	.. ..	.0
50	5 19	18 45	0 34	1 59	6 30	2.1	.. ..	.0
45	5 26	18 38	0 30	1 45	6 55	2.2	23 35	2.8
40	5 31	18 33	0 28	1 35	7 16	2.3	23 12	2.8
35	5 36	18 28	0 26	1 28	7 33	2.4	22 54	2.8
30	5 40	18 24	0 24	1 22	7 48	2.4	22 38	2.7
20	5 47	18 17	0 22	1 15	8 13	2.5	22 11	2.7
10	5 53	18 10	0 21	1 11	8 35	2.6	21 47	2.7
0	5 58	18 5	0 21	1 9	8 55	2.7	21 26	2.7
10	6 4	17 59	0 21	1 10	9 16	2.7	21 4	2.6
20	6 9	17 53	0 22	1 13	9 38	2.8	20 41	2.6
30	6 16	17 47	0 24	1 19	10 4	2.9	20 14	2.6
35	6 19	17 43	0 25	1 24	10 20	2.9	19 58	2.5
40	6 23	17 39	0 27	1 30	10 38	3.0	19 40	2.5
45	6 28	17 34	0 29	1 37	10 59	3.1	19 17	2.5
50	6 34	17 29	0 32	1 47	11 27	3.2	18 49	2.4
55	6 40	17 22	0 36	2 0	12 5	3.3	18 11	2.2
60	6 49	17 13	0 42	2 19	13 6	3.8	17 8	1.8
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 1 38.8	.7	16.0	$T_{\overline{m}}$ 15 11	2.7	60.5	16.5
12	− 1 30.8	$T_{\overline{m}_\odot}$ 12 h	1.5 min	Starost 2.8 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 5	.1	356	−3.8	♃	6 19	.0	67	−2.1
♂	17 52	.1	254	.9	♄	21 5	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 39.3	8 .5	198 35.4	193 43.9	0 28.1	92 12.3	24 45.0
2	209 39.6	8 2.4	228 40.3	223 43.2	0 30.5	122 14.6	24 44.7
4	239 40.0	8 4.2	258 45.3	253 42.5	0 33.0	152 17.0	24 44.4
6	269 40.3	8 6.1	288 50.2	283 41.7	0 35.4	182 19.3	24 44.0
8	299 40.6	8 7.9	318 55.1	313 41.0	0 37.8	212 21.6	24 43.7
10	329 40.9	8 9.8	349 .0	343 40.2	0 40.3	242 24.0	24 43.3
12	359 41.3	8 11.6	19 5.0	13 39.5	0 42.7	272 26.3	24 43.0
14	29 41.6	8 13.4	49 9.9	43 38.8	0 45.2	302 28.7	24 42.7
16	59 41.9	8 15.3	79 14.8	73 38.0	0 47.6	332 31.0	24 42.3
18	89 42.3	8 17.1	109 19.8	103 37.3	0 50.1	2 33.3	24 42.0
20	119 42.6	8 19.0	139 24.7	133 36.6	0 52.5	32 35.7	24 41.6
22	149 42.9	8 20.8	169 29.6	163 35.8	0 55.0	62 38.0	24 41.3
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	126 43.6	26	27 17.4	34	265 51.8	-21 46.9	43 47.5	12 25.5
2	155 26.7	25	27 24.1	30	295 56.2	-21 46.8	73 52.6	12 25.6
4	184 9.8	25	27 30.0	26	326 .7	-21 46.8	103 57.7	12 25.6
6	212 52.9	26	27 35.1	21	356 5.1	-21 46.7	134 2.8	12 25.7
8	241 36.0	26	27 39.4	17	26 9.6	-21 46.6	164 8.0	12 25.8
10	270 19.1	26	27 42.9	13	56 14.0	-21 46.6	194 13.1	12 25.8
12	299 2.3	26	27 45.5	9	86 18.5	-21 46.5	224 18.2	12 25.9
14	327 45.6	27	27 47.4	5	116 23.0	-21 46.5	254 23.3	12 25.9
16	356 29.0	28	27 48.5	1	146 27.4	-21 46.4	284 28.4	12 26.0
18	25 12.5	28	27 48.7	-3	176 31.9	-21 46.3	314 33.5	12 26.1
20	53 56.2	29	27 48.2	-7	206 36.4	-21 46.3	344 38.7	12 26.1
22	82 40.0	30	27 46.9	-10	236 40.8	-21 46.2	14 43.8	12 26.2
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 57	19 7	0 45	3 0	5 32	2.7	1 50	2.9
55	5 8	18 55	0 38	2 22	6 39	2.7	0 43	2.8
50	5 17	18 47	0 34	1 60	7 19	2.7	0 4	2.8
45	5 24	18 40	0 30	1 46	7 48	2.7	. . .	.0
40	5 29	18 34	0 28	1 36	8 11	2.7	. . .	.0
35	5 34	18 29	0 26	1 28	8 30	2.7	23 60	2.3
30	5 39	18 24	0 24	1 22	8 46	2.7	23 44	2.4
20	5 46	18 17	0 22	1 15	9 13	2.7	23 16	2.5
10	5 52	18 10	0 21	1 11	9 37	2.7	22 52	2.5
0	5 58	18 5	0 21	1 9	9 59	2.6	22 30	2.6
10	6 4	17 59	0 21	1 10	10 22	2.6	22 8	2.6
20	6 10	17 53	0 22	1 13	10 46	2.6	21 44	2.7
30	6 16	17 46	0 24	1 20	11 13	2.6	21 16	2.8
35	6 20	17 42	0 25	1 24	11 30	2.5	20 59	2.8
40	6 24	17 38	0 27	1 30	11 49	2.5	20 40	2.8
45	6 29	17 33	0 30	1 37	12 13	2.5	20 16	2.9
50	6 35	17 27	0 33	1 47	12 43	2.4	19 46	3.0
55	6 42	17 19	0 36	2 0	13 25	2.3	19 4	3.1
60	6 52	17 10	0 42	2 19	14 38	1.9	17 51	3.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 22.7	.7	16.0	$T_{\overline{m}}$ 16 15	2.6	60.1	16.4
12	- 1 14.7	$T_{\overline{m}_\odot}$ 12 h	1.2 min	Starost 3.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 5	.1	355	-3.8	♄	6 16	.0	67	-2.1
♂	17 50	.1	254	.9	♇	21 1	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 43.3	8 22.6	199 34.5	193 35.1	0 57.4	92 40.4	24 40.9
2	209 43.6	8 24.5	229 39.5	223 34.4	0 59.9	122 42.7	24 40.6
4	239 43.9	8 26.3	259 44.4	253 33.6	1 2.3	152 45.0	24 40.2
6	269 44.2	8 28.1	289 49.3	283 32.9	1 4.7	182 47.4	24 39.9
8	299 44.6	8 30.0	319 54.3	313 32.2	1 7.2	212 49.7	24 39.5
10	329 44.9	8 31.8	349 59.2	343 31.4	1 9.6	242 52.0	24 39.2
12	359 45.2	8 33.6	20 4.1	13 30.7	1 12.1	272 54.3	24 38.8
14	29 45.5	8 35.5	50 9.0	43 30.0	1 14.5	302 56.7	24 38.5
16	59 45.9	8 37.3	80 14.0	73 29.2	1 17.0	332 59.0	24 38.1
18	89 46.2	8 39.1	110 18.9	103 28.5	1 19.4	3 1.3	24 37.7
20	119 46.5	8 40.9	140 23.8	133 27.8	1 21.9	33 3.7	24 37.4
22	149 46.8	8 42.8	170 28.7	163 27.0	1 24.3	63 6.0	24 37.0
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	111 24.1	31	27 44.8	-14	266 45.3	-21 46.2	44 48.9	12 26.3
2	140 8.3	32	27 41.9	-18	296 49.8	-21 46.1	74 54.0	12 26.3
4	168 52.8	34	27 38.3	-22	326 54.3	-21 46.1	104 59.1	12 26.4
6	197 37.5	35	27 33.9	-26	356 58.7	-21 46.0	135 4.2	12 26.4
8	226 22.5	36	27 28.7	-30	27 3.2	-21 45.9	165 9.3	12 26.5
10	255 7.8	38	27 22.8	-33	57 7.7	-21 45.9	195 14.4	12 26.6
12	283 53.4	40	27 16.1	-37	87 12.2	-21 45.8	225 19.5	12 26.6
14	312 39.3	41	27 8.7	-41	117 16.6	-21 45.8	255 24.6	12 26.7
16	341 25.5	43	27 .6	-44	147 21.1	-21 45.7	285 29.7	12 26.7
18	10 12.1	45	26 51.8	-48	177 25.6	-21 45.7	315 34.9	12 26.8
20	38 59.0	47	26 42.3	-51	207 30.1	-21 45.6	345 40.0	12 26.9
22	67 46.4	49	26 32.1	-54	237 34.6	-21 45.6	15 45.1	12 26.9
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 54	19 9	0 45	3 4	6 36	4.0	2 60	1.3
55	5 6	18 57	0 39	2 23	7 44	3.4	1 52	1.9
50	5 15	18 48	0 34	2 1	8 24	3.2	1 11	2.1
45	5 22	18 41	0 30	1 46	8 53	3.1	0 42	2.2
40	5 28	18 35	0 28	1 36	9 15	2.9	0 19	2.3
35	5 33	18 30	0 26	1 28	9 34	2.9	. . .	.0
30	5 37	18 25	0 24	1 23	9 50	2.8	. . .	.0
20	5 45	18 17	0 22	1 15	10 18	2.7	. . .	.0
10	5 52	18 10	0 21	1 11	10 41	2.6	23 53	2.3
0	5 58	18 4	0 21	1 9	11 3	2.5	23 32	2.4
10	6 4	17 58	0 21	1 10	11 25	2.4	23 11	2.5
20	6 10	17 52	0 22	1 13	11 48	2.3	22 48	2.7
30	6 17	17 45	0 24	1 20	12 15	2.2	22 22	2.8
35	6 21	17 41	0 25	1 24	12 31	2.1	22 6	2.9
40	6 25	17 36	0 27	1 30	12 50	2.0	21 48	3.0
45	6 31	17 31	0 30	1 37	13 12	1.9	21 26	3.1
50	6 37	17 25	0 33	1 47	13 41	1.7	20 58	3.3
55	6 44	17 17	0 37	2 0	14 20	1.4	20 20	3.7
60	6 54	17 7	0 42	2 19	15 25	.7	19 16	4.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 6.8	.7	16.0	$T_{\overline{m}}$ 17 17	2.5	59.6	16.2
12	- 0 59.0	$T_{\overline{m}_\odot}$ 12 h	1.0 min	Starost 4.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 6	.1	354	-3.8	♄	6 12	.0	67	-2.1
♂	17 48	.1	253	1.0	♇	20 57	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 47.2	8 44.6	200 33.7	193 26.3	1 26.8	93 8.3	24 36.7
2	209 47.5	8 46.4	230 38.6	223 25.6	1 29.2	123 10.6	24 36.3
4	239 47.8	8 48.2	260 43.5	253 24.8	1 31.6	153 13.0	24 36.0
6	269 48.1	8 50.1	290 48.5	283 24.1	1 34.1	183 15.3	24 35.6
8	299 48.5	8 51.9	320 53.4	313 23.3	1 36.5	213 17.6	24 35.2
10	329 48.8	8 53.7	350 58.3	343 22.6	1 39.0	243 19.9	24 34.9
12	359 49.1	8 55.5	21 3.2	13 21.9	1 41.4	273 22.2	24 34.5
14	29 49.4	8 57.3	51 8.2	43 21.1	1 43.9	303 24.6	24 34.1
16	59 49.7	8 59.1	81 13.1	73 20.4	1 46.3	333 26.9	24 33.8
18	89 50.0	9 1.0	111 18.0	103 19.7	1 48.8	3 29.2	24 33.4
20	119 50.4	9 2.8	141 23.0	133 18.9	1 51.2	33 31.5	24 33.0
22	149 50.7	9 4.6	171 27.9	163 18.2	1 53.6	63 33.8	24 32.7
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	96 34.1	51	26 21.2	-58	267 39.1	-21 45.5	45 50.2	12 27.0
2	125 22.2	53	26 9.7	-61	297 43.5	-21 45.4	75 55.3	12 27.0
4	154 10.8	55	25 57.5	-64	327 48.0	-21 45.4	106 .4	12 27.1
6	182 59.7	57	25 44.6	-67	357 52.5	-21 45.3	136 5.5	12 27.1
8	211 49.1	59	25 31.2	-70	27 57.0	-21 45.3	166 10.6	12 27.2
10	240 39.0	61	25 17.1	-73	58 1.5	-21 45.2	196 15.7	12 27.3
12	269 29.3	64	25 2.4	-76	88 6.0	-21 45.2	226 20.8	12 27.3
14	298 20.0	66	24 47.2	-79	118 10.5	-21 45.1	256 25.9	12 27.4
16	327 11.2	68	24 31.3	-82	148 15.0	-21 45.1	286 31.0	12 27.4
18	356 2.8	71	24 14.9	-85	178 19.5	-21 45.0	316 36.1	12 27.5
20	24 55.0	73	23 58.0	-87	208 24.0	-21 45.0	346 41.2	12 27.5
22	53 47.5	75	23 40.5	-90	238 28.5	-21 44.9	16 46.3	12 27.6
Δ					22	0	26	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 51	19 12	0 46	3 7	8 13	4.4	3 31	.5
55	5 4	18 59	0 39	2 24	9 6	3.7	2 36	1.1
50	5 13	18 50	0 34	2 1	9 41	3.4	2 1	1.5
45	5 20	18 42	0 31	1 47	10 6	3.2	1 34	1.7
40	5 26	18 36	0 28	1 36	10 26	3.0	1 13	1.8
35	5 32	18 30	0 26	1 29	10 43	2.9	0 56	1.9
30	5 36	18 26	0 24	1 23	10 57	2.8	0 41	2.0
20	5 44	18 18	0 22	1 15	11 22	2.6	0 15	2.2
10	5 51	18 11	0 21	1 11	11 43	2.4	.. ..	.0
0	5 57	18 4	0 21	1 10	12 3	2.3	.. ..	.0
10	6 4	17 58	0 21	1 10	12 22	2.2	.. ..	.0
20	6 10	17 51	0 22	1 14	12 43	2.0	23 52	2.5
30	6 17	17 44	0 24	1 20	13 8	1.8	23 29	2.7
35	6 22	17 39	0 25	1 24	13 22	1.7	23 16	2.8
40	6 26	17 35	0 27	1 30	13 38	1.6	23 0	3.0
45	6 32	17 29	0 30	1 38	13 58	1.4	22 42	3.2
50	6 38	17 22	0 33	1 47	14 22	1.2	22 18	3.4
55	6 46	17 14	0 37	2 1	14 54	.9	21 47	3.7
60	6 56	17 4	0 42	2 19	15 42	.3	21 1	4.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 51.2	.6	16.0	$T_{\overline{m}}$ 18 16	2.2	58.9	16.1
12	− 0 43.5	$T_{\overline{m}_\odot}$ 12 h .7 min		Starost 5.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 7	.1	353	-3.8	♄	6 8	.0	67	-2.1
♂	17 46	.1	253	1.0	♃	20 53	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 51.0	9 6.4	201 32.8	193 17.5	1 56.1	93 36.1	24 32.3
2	209 51.3	9 8.2	231 37.7	223 16.7	1 58.5	123 38.4	24 31.9
4	239 51.6	9 10.0	261 42.7	253 16.0	2 1.0	153 40.7	24 31.6
6	269 51.9	9 11.8	291 47.6	283 15.3	2 3.4	183 43.1	24 31.2
8	299 52.3	9 13.6	321 52.5	313 14.5	2 5.9	213 45.4	24 30.8
10	329 52.6	9 15.4	351 57.5	343 13.8	2 8.3	243 47.7	24 30.5
12	359 52.9	9 17.2	22 2.4	13 13.0	2 10.7	273 50.0	24 30.1
14	29 53.2	9 19.0	52 7.3	43 12.3	2 13.2	303 52.3	24 29.7
16	59 53.5	9 20.9	82 12.2	73 11.6	2 15.6	333 54.6	24 29.3
18	89 53.8	9 22.7	112 17.2	103 10.8	2 18.1	3 56.9	24 29.0
20	119 54.1	9 24.5	142 22.1	133 10.1	2 20.5	33 59.2	24 28.6
22	149 54.5	9 26.3	172 27.0	163 9.4	2 22.9	64 1.5	24 28.2
Δ	2	9		-4	12	12	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	82 40.6	78	23 22.5	-93	268 33.0	-21 44.9	46 51.4	12 27.7
2	111 34.1	80	23 4.0	-95	298 37.5	-21 44.8	76 56.5	12 27.7
4	140 28.1	82	22 45.0	-97	328 42.0	-21 44.8	107 1.6	12 27.8
6	169 22.6	85	22 25.5	-100	358 46.5	-21 44.7	137 6.7	12 27.8
8	198 17.5	87	22 5.6	-102	28 51.0	-21 44.6	167 11.8	12 27.9
10	227 12.9	89	21 45.2	-104	58 55.5	-21 44.6	197 16.8	12 27.9
12	256 8.8	92	21 24.3	-106	89 .0	-21 44.5	227 21.9	12 28.0
14	285 5.1	94	21 3.0	-108	119 4.5	-21 44.5	257 27.0	12 28.0
16	314 1.9	96	20 41.4	-110	149 9.0	-21 44.4	287 32.1	12 28.1
18	342 59.2	99	20 19.3	-112	179 13.5	-21 44.4	317 37.2	12 28.1
20	11 56.9	101	19 56.8	-114	209 18.1	-21 44.3	347 42.3	12 28.2
22	40 55.0	103	19 33.9	-116	239 22.6	-21 44.3	17 47.4	12 28.2
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 48	19 14	0 46	3 11	9 58	4.2	3 43	.2
55	5 1	19 1	0 39	2 26	10 36	3.7	3 3	.7
50	5 11	18 51	0 34	2 2	11 2	3.4	2 36	1.0
45	5 18	18 43	0 31	1 47	11 22	3.1	2 14	1.3
40	5 25	18 37	0 28	1 37	11 38	2.9	1 57	1.4
35	5 30	18 31	0 26	1 29	11 52	2.8	1 42	1.6
30	5 35	18 26	0 24	1 23	12 4	2.7	1 29	1.7
20	5 43	18 18	0 22	1 15	12 24	2.4	1 7	1.9
10	5 51	18 11	0 21	1 11	12 42	2.3	0 48	2.0
0	5 57	18 4	0 21	1 10	12 58	2.1	0 30	2.2
10	6 4	17 57	0 21	1 10	13 14	1.9	0 12	2.4
20	6 10	17 50	0 22	1 14	13 32	1.8	.. ..	.0
30	6 18	17 42	0 24	1 20	13 51	1.5	.. ..	.0
35	6 22	17 38	0 26	1 24	14 3	1.4	.. ..	.0
40	6 27	17 33	0 27	1 30	14 16	1.3	.. ..	.0
45	6 33	17 27	0 30	1 38	14 32	1.1	23 58	3.1
50	6 40	17 20	0 33	1 47	14 51	.9	23 40	3.3
55	6 48	17 12	0 37	2 1	15 15	.6	23 17	3.6
60	6 59	17 1	0 42	2 19	15 49	.1	22 45	4.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 0 35.8	.6	16.0	$T_{\overline{m}}$ 19 10	2.1	58.2	15.9
12	− 0 28.3	$T_{\overline{m}_\odot}$ 12 h .5 min		Starost 6.8 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 7	.1	352	-3.8	♄	6 5	.0	67	-2.1
♂	17 44	.1	252	1.0	♃	20 49	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 54.8	9 28.1	202 32.0	193 8.6	2 25.4	94 3.8	24 27.8
2	209 55.1	9 29.9	232 36.9	223 7.9	2 27.8	124 6.1	24 27.5
4	239 55.4	9 31.6	262 41.8	253 7.1	2 30.3	154 8.4	24 27.1
6	269 55.7	9 33.4	292 46.7	283 6.4	2 32.7	184 10.7	24 26.7
8	299 56.0	9 35.2	322 51.7	313 5.7	2 35.1	214 13.0	24 26.3
10	329 56.3	9 37.0	352 56.6	343 4.9	2 37.6	244 15.3	24 25.9
12	359 56.6	9 38.8	23 1.5	13 4.2	2 40.0	274 17.6	24 25.6
14	29 56.9	9 40.6	53 6.5	43 3.4	2 42.5	304 19.9	24 25.2
16	59 57.2	9 42.4	83 11.4	73 2.7	2 44.9	334 22.2	24 24.8
18	89 57.5	9 44.2	113 16.3	103 2.0	2 47.3	4 24.5	24 24.4
20	119 57.8	9 46.0	143 21.2	133 1.2	2 49.8	34 26.8	24 24.0
22	149 58.1	9 47.8	173 26.2	163 .5	2 52.2	64 29.1	24 23.6
Δ	2	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	69 53.6	105	19 10.7	-118	269 27.1	-21 44.2	47 52.5	12 28.3
2	98 52.7	107	18 47.2	-120	299 31.6	-21 44.2	77 57.6	12 28.3
4	127 52.1	109	18 23.3	-121	329 36.1	-21 44.1	108 2.7	12 28.4
6	156 52.0	111	17 59.0	-123	359 40.6	-21 44.1	138 7.7	12 28.4
8	185 52.3	114	17 34.5	-124	29 45.2	-21 44.0	168 12.8	12 28.5
10	214 53.0	116	17 9.6	-126	59 49.7	-21 44.0	198 17.9	12 28.6
12	243 54.1	118	16 44.5	-127	89 54.2	-21 43.9	228 23.0	12 28.6
14	272 55.6	119	16 19.1	-128	119 58.7	-21 43.9	258 28.1	12 28.7
16	301 57.5	121	15 53.4	-130	150 3.2	-21 43.8	288 33.2	12 28.7
18	330 59.8	123	15 27.5	-131	180 7.8	-21 43.8	318 38.2	12 28.8
20	0 2.4	125	15 1.3	-132	210 12.3	-21 43.7	348 43.3	12 28.8
22	29 5.4	127	14 34.8	-133	240 16.8	-21 43.7	18 48.4	12 28.9
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 46	19 17	0 46	3 15	11 39	3.9	3 48	.1
55	4 59	19 3	0 39	2 27	12 4	3.5	3 21	.5
50	5 9	18 53	0 34	2 3	12 22	3.2	3 0	.8
45	5 17	18 45	0 31	1 48	12 37	3.0	2 44	1.0
40	5 23	18 38	0 28	1 37	12 49	2.8	2 31	1.2
35	5 29	18 32	0 26	1 29	12 59	2.7	2 19	1.3
30	5 34	18 27	0 25	1 23	13 8	2.5	2 9	1.4
20	5 43	18 18	0 22	1 15	13 23	2.3	1 52	1.7
10	5 50	18 11	0 21	1 11	13 36	2.1	1 37	1.8
0	5 57	18 4	0 21	1 10	13 48	1.9	1 23	2.0
10	6 4	17 57	0 21	1 10	14 1	1.8	1 8	2.2
20	6 11	17 49	0 22	1 14	14 14	1.6	0 53	2.4
30	6 19	17 41	0 24	1 20	14 29	1.3	0 35	2.6
35	6 23	17 37	0 26	1 24	14 37	1.2	0 25	2.7
40	6 28	17 32	0 27	1 30	14 47	1.1	0 12	2.9
45	6 34	17 26	0 30	1 38	14 58	.9	. . .	.0
50	6 41	17 18	0 33	1 48	15 12	.7	. . .	.0
55	6 50	17 10	0 37	2 1	15 29	.4	. . .	.0
60	7 1	16 58	0 42	2 19	15 51	.0	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 20.8	.6	16.0	$T_{\overline{m}}$	19 60	1.9	57.5	15.7
12	− 0 13.4	$T_{\overline{m}_\odot}$ 12 h .2 min		Starost 7.8 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 8	.1	351	-3.8	♃	6 1	.0	67	-2.1
♂	17 42	.1	252	1.0	♄	20 45	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 58.4	9 49.6	203 31.1	192 59.7	2 54.6	94 31.4	24 23.3
2	209 58.7	9 51.3	233 36.0	222 59.0	2 57.1	124 33.6	24 22.9
4	239 59.0	9 53.1	263 40.9	252 58.3	2 59.5	154 35.9	24 22.5
6	269 59.3	9 54.9	293 45.9	282 57.5	3 1.9	184 38.2	24 22.1
8	299 59.6	9 56.7	323 50.8	312 56.8	3 4.4	214 40.5	24 21.7
10	330 .0	9 58.5	353 55.7	342 56.0	3 6.8	244 42.8	24 21.3
12	0 .3	10 .2	24 .7	12 55.3	3 9.3	274 45.1	24 20.9
14	30 .5	10 2.0	54 5.6	42 54.5	3 11.7	304 47.4	24 20.5
16	60 .8	10 3.8	84 10.5	72 53.8	3 14.1	334 49.7	24 20.1
18	90 1.1	10 5.6	114 15.4	102 53.1	3 16.6	4 51.9	24 19.7
20	120 1.4	10 7.3	144 20.4	132 52.3	3 19.0	34 54.2	24 19.3
22	150 1.7	10 9.1	174 25.3	162 51.6	3 21.4	64 56.5	24 19.0
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	58 8.7	128	14 8.2	-134	270 21.4	-21 43.6	48 53.5	12 28.9
2	87 12.4	130	13 41.3	-135	300 25.9	-21 43.6	78 58.6	12 28.9
4	116 16.5	132	13 14.3	-136	330 30.4	-21 43.5	109 3.7	12 29.0
6	145 20.8	133	12 47.0	-137	0 35.0	-21 43.5	139 8.7	12 29.0
8	174 25.5	135	12 19.6	-138	30 39.5	-21 43.4	169 13.8	12 29.1
10	203 30.5	136	11 52.0	-139	60 44.0	-21 43.4	199 18.9	12 29.1
12	232 35.8	138	11 24.2	-140	90 48.6	-21 43.4	229 24.0	12 29.2
14	261 41.3	139	10 56.2	-140	120 53.1	-21 43.3	259 29.0	12 29.2
16	290 47.2	141	10 28.2	-141	150 57.6	-21 43.3	289 34.1	12 29.3
18	319 53.3	142	9 59.9	-142	181 2.2	-21 43.2	319 39.2	12 29.3
20	348 59.7	143	9 31.6	-142	211 6.7	-21 43.2	349 44.3	12 29.4
22	18 6.3	144	9 3.1	-143	241 11.3	-21 43.1	19 49.3	12 29.4
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 43	19 19	0 47	3 20	13 13	3.7	3 50	.0
55	4 56	19 5	0 39	2 28	13 28	3.4	3 33	.4
50	5 7	18 54	0 34	2 4	13 40	3.1	3 19	.6
45	5 15	18 46	0 31	1 48	13 49	2.9	3 8	.8
40	5 22	18 39	0 28	1 37	13 56	2.7	2 59	1.0
35	5 28	18 33	0 26	1 29	14 3	2.5	2 51	1.1
30	5 33	18 27	0 25	1 23	14 9	2.4	2 44	1.3
20	5 42	18 18	0 22	1 16	14 18	2.2	2 32	1.5
10	5 50	18 11	0 21	1 11	14 27	2.0	2 21	1.7
0	5 57	18 3	0 21	1 10	14 35	1.8	2 11	1.9
10	6 4	17 56	0 21	1 11	14 43	1.6	2 1	2.0
20	6 11	17 49	0 22	1 14	14 51	1.4	1 50	2.2
30	6 19	17 40	0 24	1 20	15 1	1.2	1 37	2.5
35	6 24	17 35	0 26	1 24	15 6	1.1	1 30	2.6
40	6 29	17 30	0 27	1 30	15 12	.9	1 22	2.8
45	6 35	17 24	0 30	1 38	15 20	.8	1 12	2.9
50	6 43	17 16	0 33	1 48	15 28	.6	1 0	3.2
55	6 52	17 7	0 37	2 1	15 39	.3	0 45	3.4
60	7 4	16 55	0 43	2 19	15 52	.0	0 25	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 0 6.1	.6	16.0	$T_{\overline{m}}$	20 45	1.8	56.9	15.5
12	0 1.2	$T_{\overline{m}_\odot}$ 11 h 60.0 min		Starost 8.8 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 8	.1	349	-3.8	♃	5 58	.0	67	-2.1
♂	17 41	.1	251	1.0	♄	20 41	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 2.0	10 10.9	204 30.2	192 50.8	3 23.9	94 58.8	24 18.6
2	210 2.3	10 12.7	234 35.2	222 50.1	3 26.3	125 1.1	24 18.2
4	240 2.6	10 14.4	264 40.1	252 49.3	3 28.7	155 3.4	24 17.8
6	270 2.9	10 16.2	294 45.0	282 48.6	3 31.1	185 5.6	24 17.4
8	300 3.2	10 18.0	324 49.9	312 47.8	3 33.6	215 7.9	24 17.0
10	330 3.5	10 19.7	354 54.9	342 47.1	3 36.0	245 10.2	24 16.6
12	0 3.8	10 21.5	24 59.8	12 46.3	3 38.4	275 12.5	24 16.2
14	30 4.1	10 23.2	55 4.7	42 45.6	3 40.9	305 14.7	24 15.8
16	60 4.4	10 25.0	85 9.7	72 44.8	3 43.3	335 17.0	24 15.4
18	90 4.7	10 26.8	115 14.6	102 44.1	3 45.7	5 19.3	24 15.0
20	120 5.0	10 28.5	145 19.5	132 43.3	3 48.1	35 21.6	24 14.6
22	150 5.3	10 30.3	175 24.4	162 42.6	3 50.6	65 23.8	24 14.1
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 13.1	145	8 34.6	-143	271 15.8	-21 43.1	49 54.4	12 29.5
2	76 20.2	147	8 5.9	-144	301 20.4	-21 43.0	79 59.5	12 29.5
4	105 27.6	148	7 37.1	-144	331 24.9	-21 43.0	110 4.6	12 29.6
6	134 35.1	149	7 8.3	-145	1 29.5	-21 42.9	140 9.6	12 29.6
8	163 42.8	150	6 39.4	-145	31 34.0	-21 42.9	170 14.7	12 29.6
10	192 50.8	151	6 10.4	-145	61 38.6	-21 42.8	200 19.8	12 29.7
12	221 58.9	151	5 41.3	-145	91 43.1	-21 42.8	230 24.8	12 29.7
14	251 7.2	152	5 12.2	-146	121 47.7	-21 42.7	260 29.9	12 29.8
16	280 15.6	153	4 43.1	-146	151 52.2	-21 42.7	290 35.0	12 29.8
18	309 24.2	154	4 13.9	-146	181 56.8	-21 42.7	320 40.0	12 29.9
20	338 33.0	154	3 44.7	-146	212 1.3	-21 42.6	350 45.1	12 29.9
22	7 41.9	155	3 15.5	-146	242 5.9	-21 42.6	20 50.2	12 30.0
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 40	19 21	0 47	3 25	14 42	3.6	3 51	.0
55	4 54	19 7	0 39	2 30	14 49	3.3	3 42	.3
50	5 5	18 56	0 34	2 5	14 54	3.0	3 34	.6
45	5 13	18 47	0 31	1 49	14 58	2.8	3 28	.7
40	5 20	18 40	0 28	1 38	15 1	2.6	3 23	.9
35	5 27	18 34	0 26	1 30	15 4	2.5	3 18	1.1
30	5 32	18 28	0 25	1 24	15 7	2.3	3 14	1.2
20	5 41	18 19	0 23	1 16	15 11	2.1	3 8	1.4
10	5 49	18 11	0 21	1 11	15 15	1.9	3 2	1.6
0	5 56	18 3	0 21	1 10	15 18	1.7	2 56	1.8
10	6 4	17 56	0 21	1 11	15 22	1.6	2 50	2.0
20	6 11	17 48	0 22	1 14	15 26	1.4	2 44	2.2
30	6 20	17 39	0 24	1 20	15 30	1.1	2 37	2.4
35	6 25	17 34	0 26	1 24	15 32	1.0	2 33	2.5
40	6 30	17 29	0 27	1 30	15 35	.9	2 28	2.7
45	6 37	17 22	0 30	1 38	15 38	.7	2 22	2.8
50	6 44	17 14	0 33	1 48	15 42	.5	2 16	3.0
55	6 54	17 5	0 37	2 1	15 47	.3	2 8	3.3
60	7 6	16 52	0 43	2 19	15 53	.0	1 57	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 8.3	.6	16.0	$T_{\overline{m}}$	21 28	1.7	56.3	15.3
12	0 15.4	$T_{\overline{m}_\odot}$	11 h 59.7 min	Starost	9.8 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 9	.1	348	-3.8	♃	5 54	.0	67	-2.1
♂	17 39	.1	250	1.0	♄	20 37	.0	205	.4

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 5.5	10 32.0	205 29.4	192 41.8	3 53.0	95 26.1	24 13.7
2	210 5.8	10 33.8	235 34.3	222 41.1	3 55.4	125 28.4	24 13.3
4	240 6.1	10 35.6	265 39.2	252 40.3	3 57.9	155 30.6	24 12.9
6	270 6.4	10 37.3	295 44.2	282 39.6	4 .3	185 32.9	24 12.5
8	300 6.7	10 39.1	325 49.1	312 38.8	4 2.7	215 35.2	24 12.1
10	330 7.0	10 40.8	355 54.0	342 38.1	4 5.1	245 37.5	24 11.7
12	0 7.3	10 42.6	25 58.9	12 37.3	4 7.5	275 39.7	24 11.3
14	30 7.6	10 44.3	56 3.9	42 36.6	4 10.0	305 42.0	24 10.9
16	60 7.8	10 46.1	86 8.8	72 35.8	4 12.4	335 44.3	24 10.5
18	90 8.1	10 47.8	116 13.7	102 35.1	4 14.8	5 46.5	24 10.1
20	120 8.4	10 49.5	146 18.7	132 34.3	4 17.2	35 48.8	24 9.6
22	150 8.7	10 51.3	176 23.6	162 33.6	4 19.7	65 51.0	24 9.2
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	36 50.9	156	2 46.3	-146	272 10.5	-21 42.5	50 55.2	12 30.0
2	66 .0	156	2 17.0	-146	302 15.0	-21 42.5	81 .3	12 30.0
4	95 9.3	157	1 47.8	-146	332 19.6	-21 42.4	111 5.4	12 30.1
6	124 18.6	157	1 18.6	-146	2 24.1	-21 42.4	141 10.4	12 30.1
8	153 28.1	158	0 49.4	-146	32 28.7	-21 42.3	171 15.5	12 30.2
10	182 37.6	158	0 20.2	-146	62 33.3	-21 42.3	201 20.6	12 30.2
12	211 47.2	158	- 0 8.9	-146	92 37.9	-21 42.3	231 25.6	12 30.2
14	240 56.9	159	- 0 38.0	-145	122 42.4	-21 42.2	261 30.7	12 30.3
16	270 6.6	159	- 1 7.1	-145	152 47.0	-21 42.2	291 35.7	12 30.3
18	299 16.4	159	- 1 36.1	-145	182 51.6	-21 42.1	321 40.8	12 30.4
20	328 26.2	159	- 2 5.0	-144	212 56.1	-21 42.1	351 45.9	12 30.4
22	357 36.0	159	- 2 33.9	-144	243 .7	-21 42.0	21 50.9	12 30.5
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 37	19 24	0 47	3 32	16 8	3.5	3 51	.0
55	4 51	19 9	0 40	2 32	16 7	3.2	3 49	.3
50	5 3	18 57	0 35	2 5	16 6	3.0	3 47	.5
45	5 11	18 48	0 31	1 49	16 5	2.8	3 46	.7
40	5 19	18 41	0 28	1 38	16 4	2.6	3 45	.9
35	5 25	18 34	0 26	1 30	16 3	2.4	3 44	1.0
30	5 31	18 29	0 25	1 24	16 3	2.3	3 43	1.1
20	5 40	18 19	0 23	1 16	16 2	2.1	3 41	1.4
10	5 49	18 11	0 21	1 12	16 1	1.9	3 40	1.5
0	5 56	18 3	0 21	1 10	15 60	1.7	3 38	1.7
10	6 4	17 55	0 21	1 11	15 59	1.5	3 37	1.9
20	6 12	17 47	0 22	1 14	15 58	1.4	3 35	2.1
30	6 21	17 38	0 24	1 20	15 57	1.1	3 34	2.3
35	6 26	17 33	0 26	1 24	15 57	1.0	3 33	2.5
40	6 31	17 27	0 27	1 30	15 56	.9	3 32	2.6
45	6 38	17 20	0 30	1 38	15 56	.7	3 30	2.8
50	6 46	17 12	0 33	1 48	15 55	.5	3 29	3.0
55	6 56	17 2	0 37	2 1	15 54	.3	3 27	3.2
60	7 8	16 50	0 43	2 19	15 52	.0	3 24	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 22.4	.6	16.0	$T_{\overline{m}}$	22 10	1.7	55.8	15.2
12	0 29.2	$T_{\overline{m}_\odot}$	11 h 59.5 min	Starost	10.8 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 9	.1	347	-3.8	♃	5 50	.0	67	-2.1
♂	17 37	.1	250	1.0	♄	20 33	.0	205	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 9.0	10 53.0	206 28.5	192 32.8	4 22.1	95 53.3	24 8.8
2	210 9.2	10 54.8	236 33.4	222 32.1	4 24.5	125 55.6	24 8.4
4	240 9.5	10 56.5	266 38.4	252 31.3	4 26.9	155 57.8	24 8.0
6	270 9.8	10 58.3	296 43.3	282 30.5	4 29.3	186 .1	24 7.6
8	300 10.1	11 .0	326 48.2	312 29.8	4 31.8	216 2.3	24 7.1
10	330 10.4	11 1.7	356 53.2	342 29.0	4 34.2	246 4.6	24 6.7
12	0 10.6	11 3.5	26 58.1	12 28.3	4 36.6	276 6.9	24 6.3
14	30 10.9	11 5.2	57 3.0	42 27.5	4 39.0	306 9.1	24 5.9
16	60 11.2	11 6.9	87 7.9	72 26.8	4 41.4	336 11.4	24 5.5
18	90 11.5	11 8.7	117 12.9	102 26.0	4 43.8	6 13.6	24 5.0
20	120 11.7	11 10.4	147 17.8	132 25.2	4 46.2	36 15.9	24 4.6
22	150 12.0	11 12.1	177 22.7	162 24.5	4 48.7	66 18.1	24 4.2
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	26 45.9	159	-3 2.7	-144	273 5.3	-21 42.0	51 56.0	12 30.5
2	55 55.8	159	-3 31.4	-143	303 9.9	-21 42.0	82 1.0	12 30.5
4	85 5.7	159	-4 .1	-143	333 14.4	-21 41.9	112 6.1	12 30.6
6	114 15.5	159	-4 28.6	-142	3 19.0	-21 41.9	142 11.1	12 30.6
8	143 25.4	159	-4 57.1	-142	33 23.6	-21 41.8	172 16.2	12 30.6
10	172 35.3	159	-5 25.4	-141	63 28.2	-21 41.8	202 21.2	12 30.7
12	201 45.1	159	-5 53.6	-140	93 32.8	-21 41.8	232 26.3	12 30.7
14	230 54.9	159	-6 21.7	-140	123 37.4	-21 41.7	262 31.4	12 30.8
16	260 4.6	159	-6 49.6	-139	153 41.9	-21 41.7	292 36.4	12 30.8
18	289 14.3	158	-7 17.5	-138	183 46.5	-21 41.6	322 41.5	12 30.8
20	318 24.0	158	-7 45.1	-138	213 51.1	-21 41.6	352 46.5	12 30.9
22	347 33.6	158	-8 12.7	-137	243 55.7	-21 41.5	22 51.6	12 30.9
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 34	19 26	0 48	3 40	17 33	3.6	3 51	.0
55	4 49	19 11	0 40	2 34	17 24	3.2	3 56	.3
50	5 1	18 59	0 35	2 6	17 17	3.0	4 0	.5
45	5 10	18 50	0 31	1 50	17 11	2.7	4 3	.7
40	5 17	18 42	0 28	1 38	17 6	2.6	4 6	.9
35	5 24	18 35	0 26	1 30	17 2	2.4	4 8	1.0
30	5 30	18 29	0 25	1 24	16 58	2.3	4 10	1.2
20	5 40	18 19	0 23	1 16	16 52	2.1	4 14	1.4
10	5 48	18 11	0 21	1 12	16 46	1.9	4 17	1.6
0	5 56	18 3	0 21	1 10	16 41	1.7	4 20	1.7
10	6 4	17 55	0 21	1 11	16 36	1.6	4 23	1.9
20	6 12	17 46	0 22	1 14	16 31	1.4	4 26	2.1
30	6 21	17 37	0 24	1 20	16 25	1.2	4 30	2.3
35	6 26	17 32	0 26	1 25	16 21	1.1	4 32	2.4
40	6 32	17 26	0 28	1 30	16 17	.9	4 34	2.6
45	6 39	17 19	0 30	1 38	16 13	.8	4 37	2.7
50	6 47	17 10	0 33	1 48	16 8	.6	4 40	2.9
55	6 58	17 0	0 37	2 1	16 1	.3	4 44	3.2
60	7 11	16 47	0 43	2 19	15 52	.0	4 50	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 36.0	.6	16.0	$T_{\overline{m}}$	22 51	1.7	55.3	15.1
12	0 42.7	$T_{\overline{m}_\odot}$	11 h 59.3 min	Starost 11.8 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 10	.1	346	-3.8	♄	5 47	.0	67	-2.1
♂	17 35	.1	249	1.1	♃	20 29	.0	205	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 12.3	11 13.8	207 27.6	192 23.7	4 51.1	96 20.4	24 3.8
2	210 12.6	11 15.6	237 32.6	222 23.0	4 53.5	126 22.6	24 3.3
4	240 12.8	11 17.3	267 37.5	252 22.2	4 55.9	156 24.9	24 2.9
6	270 13.1	11 19.0	297 42.4	282 21.4	4 58.3	186 27.2	24 2.5
8	300 13.4	11 20.7	327 47.4	312 20.7	5 .7	216 29.4	24 2.1
10	330 13.6	11 22.5	357 52.3	342 19.9	5 3.1	246 31.7	24 1.6
12	0 13.9	11 24.2	27 57.2	12 19.1	5 5.5	276 33.9	24 1.2
14	30 14.2	11 25.9	58 2.1	42 18.4	5 7.9	306 36.2	24 .8
16	60 14.4	11 27.6	88 7.1	72 17.6	5 10.3	336 38.4	24 .3
18	90 14.7	11 29.3	118 12.0	102 16.8	5 12.8	6 40.6	23 59.9
20	120 15.0	11 31.0	148 16.9	132 16.1	5 15.2	36 42.9	23 59.5
22	150 15.2	11 32.8	178 21.9	162 15.3	5 17.6	66 45.1	23 59.0
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	16 43.1	157	-8 40.0	-136	274 .3	-21 41.5	52 56.6	12 30.9
2	45 52.5	157	-9 7.3	-135	304 4.9	-21 41.5	83 1.7	12 31.0
4	75 1.9	156	-9 34.3	-134	334 9.5	-21 41.4	113 6.7	12 31.0
6	104 11.1	156	-10 1.2	-133	4 14.1	-21 41.4	143 11.7	12 31.1
8	133 20.3	155	-10 27.9	-132	34 18.7	-21 41.3	173 16.8	12 31.1
10	162 29.4	155	-10 54.4	-132	64 23.3	-21 41.3	203 21.8	12 31.1
12	191 38.3	154	-11 20.7	-130	94 27.9	-21 41.3	233 26.9	12 31.2
14	220 47.1	154	-11 46.7	-129	124 32.5	-21 41.2	263 31.9	12 31.2
16	249 55.8	153	-12 12.6	-128	154 37.1	-21 41.2	293 37.0	12 31.2
18	279 4.4	152	-12 38.3	-127	184 41.7	-21 41.2	323 42.0	12 31.3
20	308 12.8	151	-13 3.8	-126	214 46.3	-21 41.1	353 47.1	12 31.3
22	337 21.1	151	-13 29.0	-125	244 50.9	-21 41.1	23 52.1	12 31.3
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 31	19 29	0 48	3 51	18 59	3.7	3 52	.0
55	4 47	19 13	0 40	2 35	18 41	3.3	4 4	.4
50	4 59	19 1	0 35	2 7	18 28	3.0	4 13	.6
45	5 8	18 51	0 31	1 50	18 17	2.8	4 21	.8
40	5 16	18 43	0 28	1 39	18 8	2.6	4 27	1.0
35	5 23	18 36	0 26	1 30	18 0	2.5	4 33	1.1
30	5 29	18 30	0 25	1 24	17 54	2.3	4 38	1.2
20	5 39	18 20	0 23	1 16	17 42	2.1	4 46	1.4
10	5 48	18 11	0 21	1 12	17 32	2.0	4 54	1.6
0	5 56	18 2	0 21	1 10	17 23	1.8	5 1	1.8
10	6 4	17 54	0 21	1 11	17 14	1.6	5 8	1.9
20	6 12	17 46	0 22	1 14	17 4	1.5	5 16	2.1
30	6 22	17 36	0 24	1 20	16 53	1.3	5 25	2.3
35	6 27	17 31	0 26	1 25	16 47	1.2	5 30	2.4
40	6 33	17 24	0 28	1 30	16 40	1.0	5 36	2.6
45	6 40	17 17	0 30	1 38	16 31	.9	5 43	2.8
50	6 49	17 8	0 33	1 48	16 21	.7	5 51	3.0
55	6 59	16 58	0 37	2 1	16 9	.4	6 1	3.2
60	7 13	16 44	0 43	2 20	15 53	.1	6 15	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 49.3	.5	15.9	$T_{\overline{m}}$	23 33	1.8	54.9	15.0
12	0 55.7	$T_{\overline{m}_\odot}$	11 h 59.1 min	Starost 12.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 11	.1	345	-3.8	♄	5 43	.0	67	-2.1
♂	17 33	.1	249	1.1	♃	20 25	.0	205	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 15.5	11 34.5	208 26.8	192 14.5	5 20.0	96 47.4	23 58.6
2	210 15.8	11 36.2	238 31.7	222 13.8	5 22.4	126 49.6	23 58.2
4	240 16.0	11 37.9	268 36.6	252 13.0	5 24.8	156 51.9	23 57.7
6	270 16.3	11 39.6	298 41.6	282 12.2	5 27.2	186 54.1	23 57.3
8	300 16.5	11 41.3	328 46.5	312 11.4	5 29.6	216 56.4	23 56.9
10	330 16.8	11 43.0	358 51.4	342 10.7	5 32.0	246 58.6	23 56.4
12	0 17.1	11 44.7	28 56.4	12 9.9	5 34.4	277 .8	23 56.0
14	30 17.3	11 46.4	59 1.3	42 9.1	5 36.8	307 3.1	23 55.5
16	60 17.6	11 48.1	89 6.2	72 8.4	5 39.2	337 5.3	23 55.1
18	90 17.8	11 49.8	119 11.1	102 7.6	5 41.6	7 7.6	23 54.7
20	120 18.1	11 51.5	149 16.1	132 6.8	5 44.0	37 9.8	23 54.2
22	150 18.3	11 53.2	179 21.0	162 6.0	5 46.4	67 12.0	23 53.8
Δ	1	9		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	6 29.3	150	-13 54.0	-124	274 55.5	-21 41.0	53 57.1	12 31.4
2	35 37.3	149	-14 18.7	-122	305 .1	-21 41.0	84 2.2	12 31.4
4	64 45.1	148	-14 43.2	-121	335 4.7	-21 41.0	114 7.2	12 31.4
6	93 52.8	147	-15 7.4	-120	5 9.3	-21 40.9	144 12.3	12 31.5
8	123 .3	147	-15 31.4	-119	35 13.9	-21 40.9	174 17.3	12 31.5
10	152 7.6	146	-15 55.1	-117	65 18.5	-21 40.9	204 22.3	12 31.5
12	181 14.7	145	-16 18.5	-116	95 23.2	-21 40.8	234 27.4	12 31.6
14	210 21.7	144	-16 41.6	-114	125 27.8	-21 40.8	264 32.4	12 31.6
16	239 28.5	143	-17 4.5	-113	155 32.4	-21 40.7	294 37.4	12 31.6
18	268 35.1	142	-17 27.1	-111	185 37.0	-21 40.7	324 42.5	12 31.6
20	297 41.5	141	-17 49.3	-110	215 41.6	-21 40.7	354 47.5	12 31.7
22	326 47.6	140	-18 11.2	-108	245 46.2	-21 40.6	24 52.6	12 31.7
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 28	19 31	0 48	4 9	20 27	3.7	3 52	.1
55	4 44	19 15	0 40	2 37	19 59	3.3	4 12	.5
50	4 57	19 2	0 35	2 8	19 39	3.0	4 28	.7
45	5 6	18 52	0 31	1 51	19 23	2.8	4 40	.9
40	5 15	18 44	0 28	1 39	19 10	2.6	4 50	1.1
35	5 22	18 37	0 26	1 31	18 59	2.5	4 59	1.2
30	5 28	18 31	0 25	1 24	18 50	2.4	5 7	1.3
20	5 38	18 20	0 23	1 16	18 34	2.2	5 21	1.5
10	5 47	18 11	0 22	1 12	18 19	2.0	5 32	1.7
0	5 56	18 2	0 21	1 10	18 6	1.9	5 44	1.8
10	6 4	17 54	0 21	1 11	17 53	1.7	5 55	2.0
20	6 13	17 45	0 22	1 14	17 39	1.6	6 7	2.2
30	6 22	17 35	0 24	1 20	17 23	1.4	6 21	2.4
35	6 28	17 29	0 26	1 25	17 14	1.3	6 29	2.5
40	6 34	17 23	0 28	1 31	17 4	1.2	6 38	2.6
45	6 42	17 15	0 30	1 38	16 52	1.0	6 49	2.8
50	6 50	17 7	0 33	1 48	16 37	.8	7 2	3.0
55	7 1	16 55	0 37	2 1	16 19	.5	7 19	3.3
60	7 16	16 41	0 43	2 20	15 54	.1	7 41	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 2.2	.5	15.9	$T_{\overline{m}}$	. . . .	1.0	54.6	14.9
12	1 8.4	$T_{\overline{m}_\odot}$	11 h 58.9 min	Starost 13.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 11	.1	344	-3.8	♆	5 39	.0	66	-2.1
♂	17 32	.1	248	1.1	♄	20 21	.0	205	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 18.6	11 54.9	209 25.9	192 5.2	5 48.8	97 14.3	23 53.3
2	210 18.9	11 56.6	239 30.9	222 4.5	5 51.1	127 16.5	23 52.9
4	240 19.1	11 58.3	269 35.8	252 3.7	5 53.5	157 18.7	23 52.4
6	270 19.4	12 .0	299 40.7	282 2.9	5 55.9	187 21.0	23 52.0
8	300 19.6	12 1.7	329 45.6	312 2.1	5 58.3	217 23.2	23 51.5
10	330 19.9	12 3.4	359 50.6	342 1.4	6 .7	247 25.4	23 51.1
12	0 20.1	12 5.0	29 55.5	12 .6	6 3.1	277 27.7	23 50.6
14	30 20.4	12 6.7	60 .4	41 59.8	6 5.5	307 29.9	23 50.2
16	60 20.6	12 8.4	90 5.4	71 59.0	6 7.9	337 32.1	23 49.7
18	90 20.9	12 10.1	120 10.3	101 58.2	6 10.3	7 34.4	23 49.3
20	120 21.1	12 11.8	150 15.2	131 57.4	6 12.7	37 36.6	23 48.8
22	150 21.4	12 13.5	180 20.1	161 56.7	6 15.0	67 38.8	23 48.4
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	355 53.6	139	-18 32.9	-107	275 50.9	-21 40.6	54 57.6	12 31.7
2	24 59.4	138	-18 54.2	-105	305 55.5	-21 40.6	85 2.6	12 31.8
4	54 5.0	137	-19 15.1	-103	336 .1	-21 40.5	115 7.6	12 31.8
6	83 10.4	136	-19 35.8	-101	6 4.7	-21 40.5	145 12.7	12 31.8
8	112 15.5	135	-19 56.1	-100	36 9.4	-21 40.5	175 17.7	12 31.9
10	141 20.5	134	-20 16.0	-98	66 14.0	-21 40.4	205 22.7	12 31.9
12	170 25.2	133	-20 35.6	-96	96 18.6	-21 40.4	235 27.8	12 31.9
14	199 29.7	131	-20 54.8	-94	126 23.3	-21 40.4	265 32.8	12 31.9
16	228 34.0	130	-21 13.7	-92	156 27.9	-21 40.3	295 37.8	12 32.0
18	257 38.1	129	-21 32.2	-91	186 32.5	-21 40.3	325 42.9	12 32.0
20	286 41.9	128	-21 50.3	-89	216 37.2	-21 40.3	355 47.9	12 32.0
22	315 45.6	127	-22 8.0	-87	246 41.8	-21 40.2	25 52.9	12 32.1
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 25	19 34	0 49	: : :	21 57	3.7	3 54	.2
55	4 42	19 17	0 41	2 39	21 17	3.2	4 24	.6
50	4 55	19 4	0 35	2 9	20 50	2.9	4 45	.9
45	5 5	18 53	0 31	1 51	20 30	2.7	5 2	1.1
40	5 13	18 45	0 29	1 40	20 13	2.6	5 16	1.3
35	5 20	18 38	0 26	1 31	19 59	2.5	5 28	1.4
30	5 27	18 31	0 25	1 25	19 47	2.4	5 39	1.5
20	5 37	18 20	0 23	1 16	19 26	2.2	5 57	1.7
10	5 47	18 11	0 22	1 12	19 8	2.1	6 13	1.8
0	5 55	18 2	0 21	1 10	18 51	2.0	6 28	1.9
10	6 4	17 53	0 21	1 11	18 35	1.9	6 43	2.1
20	6 13	17 44	0 22	1 14	18 17	1.7	6 59	2.2
30	6 23	17 34	0 24	1 20	17 57	1.6	7 17	2.4
35	6 29	17 28	0 26	1 25	17 45	1.5	7 28	2.5
40	6 35	17 21	0 28	1 31	17 32	1.4	7 41	2.6
45	6 43	17 14	0 30	1 38	17 16	1.2	7 55	2.7
50	6 52	17 5	0 33	1 48	16 57	1.1	8 13	2.9
55	7 3	16 53	0 38	2 2	16 32	.8	8 37	3.2
60	7 18	16 38	0 44	2 20	15 57	.3	9 10	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 14.6	.5	15.9	$T_{\overline{m}}$	0 17	1.9	54.3	14.8
12	1 20.6	$T_{\overline{m}_\odot}$	11 h 58.7 min	Starost 14.8 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 12	.1	343	-3.8	♆	5 36	.0	66	-2.1
♂	17 30	.1	248	1.1	♄	20 17	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 21.6	12 15.1	210 25.1	191 55.9	6 17.4	97 41.1	23 47.9
2	210 21.8	12 16.8	240 30.0	221 55.1	6 19.8	127 43.3	23 47.5
4	240 22.1	12 18.5	270 34.9	251 54.3	6 22.2	157 45.5	23 47.0
6	270 22.3	12 20.2	300 39.8	281 53.5	6 24.6	187 47.7	23 46.6
8	300 22.6	12 21.8	330 44.8	311 52.7	6 27.0	217 50.0	23 46.1
10	330 22.8	12 23.5	0 49.7	341 51.9	6 29.3	247 52.2	23 45.6
12	0 23.1	12 25.2	30 54.6	11 51.1	6 31.7	277 54.4	23 45.2
14	30 23.3	12 26.8	60 59.6	41 50.3	6 34.1	307 56.6	23 44.7
16	60 23.5	12 28.5	91 4.5	71 49.6	6 36.5	337 58.9	23 44.3
18	90 23.8	12 30.2	121 9.4	101 48.8	6 38.8	8 1.1	23 43.8
20	120 24.0	12 31.8	151 14.3	131 48.0	6 41.2	38 3.3	23 43.3
22	150 24.3	12 33.5	181 19.3	161 47.2	6 43.6	68 5.5	23 42.9
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	344 49.0	126	-22 25.3	-85	276 46.4	-21 40.2	55 57.9	12 32.1
2	13 52.2	125	-22 42.2	-83	306 51.1	-21 40.2	86 3.0	12 32.1
4	42 55.1	124	-22 58.7	-81	336 55.7	-21 40.1	116 8.0	12 32.1
6	71 57.9	123	-23 14.8	-78	7 .4	-21 40.1	146 13.0	12 32.2
8	101 .4	122	-23 30.5	-76	37 5.0	-21 40.1	176 18.0	12 32.2
10	130 2.7	121	-23 45.8	-74	67 9.6	-21 40.0	206 23.0	12 32.2
12	159 4.8	119	-24 .6	-72	97 14.3	-21 40.0	236 28.1	12 32.2
14	188 6.7	118	-24 15.0	-70	127 18.9	-21 40.0	266 33.1	12 32.3
16	217 8.4	117	-24 28.9	-68	157 23.6	-21 39.9	296 38.1	12 32.3
18	246 9.9	116	-24 42.4	-65	187 28.2	-21 39.9	326 43.1	12 32.3
20	275 11.1	115	-24 55.5	-63	217 32.9	-21 39.9	356 48.1	12 32.3
22	304 12.2	114	-25 8.1	-61	247 37.5	-21 39.8	26 53.2	12 32.4
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 22	19 36	0 49	: ::	23 27	3.5	3 59	.4
55	4 40	19 19	0 41	2 42	22 34	2.9	4 39	.9
50	4 53	19 5	0 35	2 10	21 60	2.7	5 7	1.2
45	5 3	18 55	0 31	1 52	21 35	2.6	5 29	1.4
40	5 12	18 46	0 29	1 40	21 15	2.5	5 47	1.5
35	5 19	18 38	0 27	1 31	20 58	2.4	6 2	1.6
30	5 26	18 32	0 25	1 25	20 44	2.3	6 15	1.7
20	5 37	18 21	0 23	1 17	20 19	2.2	6 37	1.8
10	5 46	18 11	0 22	1 12	19 58	2.1	6 56	1.9
0	5 55	18 2	0 21	1 10	19 39	2.1	7 14	2.0
10	6 4	17 53	0 21	1 11	19 20	2.0	7 32	2.1
20	6 13	17 44	0 22	1 14	18 59	1.9	7 52	2.2
30	6 24	17 33	0 24	1 20	18 35	1.8	8 14	2.4
35	6 30	17 27	0 26	1 25	18 21	1.7	8 28	2.4
40	6 36	17 20	0 28	1 31	18 5	1.6	8 43	2.5
45	6 44	17 12	0 30	1 38	17 46	1.5	9 1	2.6
50	6 54	17 3	0 33	1 48	17 22	1.4	9 24	2.8
55	7 5	16 51	0 38	2 2	16 51	1.2	9 55	3.1
60	7 20	16 36	0 44	2 20	16 4	.6	10 40	3.6
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 26.6	.5	15.9	$T_{\overline{m}}$	1 3	2.0	54.1	14.7
12	1 32.4	$T_{\overline{m}_\odot}$	11 h 58.5 min	Starost 15.8 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 13	.1	342	-3.8	♃	5 32	.0	66	-2.1
♂	17 28	.1	247	1.1	♄	20 13	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 24.5	12 35.2	211 24.2	191 46.4	6 46.0	98 7.8	23 42.4
2	210 24.7	12 36.8	241 29.1	221 45.6	6 48.3	128 10.0	23 41.9
4	240 25.0	12 38.5	271 34.1	251 44.8	6 50.7	158 12.2	23 41.5
6	270 25.2	12 40.1	301 39.0	281 44.0	6 53.1	188 14.4	23 41.0
8	300 25.4	12 41.8	331 43.9	311 43.2	6 55.4	218 16.6	23 40.5
10	330 25.7	12 43.5	1 48.8	341 42.4	6 57.8	248 18.9	23 40.1
12	0 25.9	12 45.1	31 53.8	11 41.6	7 .2	278 21.1	23 39.6
14	30 26.1	12 46.8	61 58.7	41 40.8	7 2.5	308 23.3	23 39.1
16	60 26.3	12 48.4	92 3.6	71 40.0	7 4.9	338 25.5	23 38.7
18	90 26.6	12 50.1	122 8.6	101 39.2	7 7.3	8 27.7	23 38.2
20	120 26.8	12 51.7	152 13.5	131 38.4	7 9.6	38 29.9	23 37.7
22	150 27.0	12 53.4	182 18.4	161 37.6	7 12.0	68 32.1	23 37.2
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	333 13.1	113	-25 20.2	-58	277 42.2	-21 39.8	56 58.2	12 32.4
2	2 13.8	112	-25 31.8	-56	307 46.8	-21 39.8	87 3.2	12 32.4
4	31 14.3	112	-25 43.0	-54	337 51.5	-21 39.7	117 8.2	12 32.4
6	60 14.6	111	-25 53.7	-51	7 56.2	-21 39.7	147 13.2	12 32.4
8	89 14.7	110	-26 4.0	-49	38 .8	-21 39.7	177 18.2	12 32.5
10	118 14.7	109	-26 13.7	-46	68 5.5	-21 39.6	207 23.2	12 32.5
12	147 14.4	108	-26 23.0	-44	98 10.1	-21 39.6	237 28.3	12 32.5
14	176 14.1	107	-26 31.7	-41	128 14.8	-21 39.6	267 33.3	12 32.5
16	205 13.5	107	-26 40.0	-39	158 19.5	-21 39.6	297 38.3	12 32.6
18	234 12.9	106	-26 47.7	-36	188 24.1	-21 39.5	327 43.3	12 32.6
20	263 12.1	105	-26 55.0	-34	218 28.8	-21 39.5	357 48.3	12 32.6
22	292 11.1	105	-27 1.7	-31	248 33.5	-21 39.5	27 53.3	12 32.6
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 19	19 39	0 50	: ::	.. ..	.0	4 8	.9
55	4 37	19 21	0 41	2 44	23 44	2.4	5 1	1.4
50	4 51	19 7	0 35	2 11	23 4	2.3	5 36	1.6
45	5 1	18 56	0 32	1 53	22 36	2.3	6 2	1.7
40	5 10	18 47	0 29	1 40	22 14	2.3	6 23	1.8
35	5 18	18 39	0 27	1 32	21 55	2.2	6 40	1.9
30	5 25	18 32	0 25	1 25	21 40	2.2	6 55	1.9
20	5 36	18 21	0 23	1 17	21 13	2.2	7 20	2.0
10	5 46	18 11	0 22	1 12	20 50	2.2	7 42	2.0
0	5 55	18 2	0 21	1 10	20 29	2.1	8 3	2.1
10	6 4	17 52	0 21	1 11	20 7	2.1	8 23	2.2
20	6 13	17 43	0 23	1 14	19 45	2.1	8 45	2.2
30	6 24	17 32	0 24	1 20	19 18	2.0	9 11	2.3
35	6 30	17 26	0 26	1 25	19 3	2.0	9 26	2.3
40	6 37	17 19	0 28	1 31	18 45	2.0	9 43	2.4
45	6 45	17 11	0 30	1 39	18 23	1.9	10 5	2.4
50	6 55	17 1	0 33	1 49	17 56	1.8	10 31	2.5
55	7 7	16 49	0 38	2 2	17 19	1.7	11 8	2.7
60	7 23	16 33	0 44	2 21	16 19	1.3	12 7	3.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	1 38.1	.5	15.9	$T_{\overline{m}}$	1 51	2.1	54.0	14.7
12	1 43.7	$T_{\overline{m}_\odot}$	11 h 58.3 min	Starost 16.8 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 13	.1	340	-3.8	♃	5 28	.0	66	-2.2
♂	17 26	.1	247	1.1	♄	20 9	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 27.3	12 55.0	212 23.3	191 36.8	7 14.4	98 34.4	23 36.8
2	210 27.5	12 56.6	242 28.3	221 36.0	7 16.7	128 36.6	23 36.3
4	240 27.7	12 58.3	272 33.2	251 35.1	7 19.1	158 38.8	23 35.8
6	270 27.9	12 59.9	302 38.1	281 34.3	7 21.4	188 41.0	23 35.3
8	300 28.1	13 1.6	332 43.1	311 33.5	7 23.8	218 43.2	23 34.9
10	330 28.4	13 3.2	2 48.0	341 32.7	7 26.2	248 45.4	23 34.4
12	0 28.6	13 4.8	32 52.9	11 31.9	7 28.5	278 47.6	23 33.9
14	30 28.8	13 6.5	62 57.8	41 31.1	7 30.9	308 49.8	23 33.4
16	60 29.0	13 8.1	93 2.8	71 30.3	7 33.2	338 52.0	23 32.9
18	90 29.2	13 9.7	123 7.7	101 29.5	7 35.6	8 54.3	23 32.5
20	120 29.5	13 11.4	153 12.6	131 28.6	7 37.9	38 56.5	23 32.0
22	150 29.7	13 13.0	183 17.6	161 27.8	7 40.3	68 58.7	23 31.5
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	321 10.0	104	-27 7.9	-29	278 38.1	-21 39.4	57 58.3	12 32.6
2	350 8.8	103	-27 13.6	-26	308 42.8	-21 39.4	88 3.3	12 32.7
4	19 7.5	103	-27 18.8	-23	338 47.5	-21 39.4	118 8.3	12 32.7
6	48 6.1	102	-27 23.5	-21	8 52.2	-21 39.4	148 13.3	12 32.7
8	77 4.6	102	-27 27.6	-18	38 56.8	-21 39.3	178 18.3	12 32.7
10	106 2.9	102	-27 31.3	-15	69 1.5	-21 39.3	208 23.3	12 32.7
12	135 1.3	101	-27 34.3	-13	99 6.2	-21 39.3	238 28.4	12 32.8
14	163 59.5	101	-27 36.9	-10	129 10.9	-21 39.2	268 33.4	12 32.8
16	192 57.7	101	-27 38.9	-7	159 15.5	-21 39.2	298 38.4	12 32.8
18	221 55.8	100	-27 40.4	-5	189 20.2	-21 39.2	328 43.4	12 32.8
20	250 53.8	100	-27 41.4	-2	219 24.9	-21 39.2	358 48.4	12 32.8
22	279 51.9	100	-27 41.8	1	249 29.6	-21 39.1	28 53.4	12 32.8
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 17	19 41	0 50	: ::	0 50	2.6	4 29	1.9
55	4 35	19 23	0 41	2 46	. . . .	.0	5 35	2.0
50	4 49	19 8	0 36	2 12	. . . .	.0	6 15	2.1
45	4 60	18 57	0 32	1 53	23 31	1.9	6 43	2.1
40	5 9	18 48	0 29	1 41	23 8	2.0	7 6	2.1
35	5 17	18 40	0 27	1 32	22 49	2.0	7 25	2.1
30	5 24	18 33	0 25	1 25	22 33	2.0	7 41	2.1
20	5 35	18 21	0 23	1 17	22 5	2.1	8 8	2.1
10	5 45	18 11	0 22	1 12	21 42	2.1	8 31	2.1
0	5 55	18 1	0 21	1 11	21 20	2.1	8 53	2.1
10	6 4	17 52	0 22	1 11	20 58	2.2	9 15	2.1
20	6 14	17 42	0 23	1 14	20 34	2.2	9 38	2.1
30	6 25	17 31	0 24	1 21	20 7	2.2	10 6	2.1
35	6 31	17 25	0 26	1 25	19 50	2.2	10 22	2.1
40	6 38	17 17	0 28	1 31	19 32	2.2	10 40	2.1
45	6 47	17 9	0 30	1 39	19 9	2.3	11 3	2.1
50	6 57	16 59	0 34	1 49	18 40	2.3	11 32	2.1
55	7 9	16 46	0 38	2 2	17 59	2.3	12 12	2.1
60	7 25	16 30	0 44	2 21	16 51	2.5	13 20	2.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 49.2	.4	15.9	$T_{\overline{m}}$ 2 41	2.1	54.0	14.7
12	1 54.5	$T_{\overline{m}_\odot}$ 11 h 58.1 min		Starost 17.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 14	.1	339	-3.8	♄	5 25	.0	66	-2.2
♂	17 24	.1	246	1.1	♃	20 5	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 29.9	13 14.6	213 22.5	191 27.0	7 42.6	99 .9	23 31.0
2	210 30.1	13 16.2	243 27.4	221 26.2	7 45.0	129 3.1	23 30.5
4	240 30.3	13 17.9	273 32.3	251 25.4	7 47.3	159 5.3	23 30.0
6	270 30.5	13 19.5	303 37.3	281 24.6	7 49.6	189 7.5	23 29.6
8	300 30.8	13 21.1	333 42.2	311 23.7	7 52.0	219 9.7	23 29.1
10	330 31.0	13 22.7	3 47.1	341 22.9	7 54.3	249 11.9	23 28.6
12	0 31.2	13 24.4	33 52.1	11 22.1	7 56.7	279 14.1	23 28.1
14	30 31.4	13 26.0	63 57.0	41 21.3	7 59.0	309 16.3	23 27.6
16	60 31.6	13 27.6	94 1.9	71 20.4	8 1.3	339 18.5	23 27.1
18	90 31.8	13 29.2	124 6.8	101 19.6	8 3.7	9 20.7	23 26.6
20	120 32.0	13 30.8	154 11.8	131 18.8	8 6.0	39 22.9	23 26.1
22	150 32.2	13 32.4	184 16.7	161 18.0	8 8.4	69 25.1	23 25.6
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	308 49.9	100	-27 41.7	3	279 34.3	-21 39.1	58 58.4	12 32.9
2	337 47.8	100	-27 41.0	6	309 39.0	-21 39.1	89 3.4	12 32.9
4	6 45.8	100	-27 39.8	9	339 43.7	-21 39.1	119 8.4	12 32.9
6	35 43.7	100	-27 38.1	11	9 48.3	-21 39.0	149 13.4	12 32.9
8	64 41.7	100	-27 35.8	14	39 53.0	-21 39.0	179 18.4	12 32.9
10	93 39.7	100	-27 33.0	17	69 57.7	-21 39.0	209 23.4	12 32.9
12	122 37.7	100	-27 29.6	19	100 2.4	-21 39.0	239 28.4	12 33.0
14	151 35.7	100	-27 25.8	22	130 7.1	-21 38.9	269 33.3	12 33.0
16	180 33.7	100	-27 21.3	25	160 11.8	-21 38.9	299 38.3	12 33.0
18	209 31.8	101	-27 16.4	27	190 16.5	-21 38.9	329 43.3	12 33.0
20	238 30.0	101	-27 10.9	30	220 21.2	-21 38.9	359 48.3	12 33.0
22	267 28.2	101	-27 4.9	33	250 25.9	-21 38.8	29 53.3	12 33.0
Δ					23	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 14	19 44	0 51	: ::	1 52	1.4	5 13	3.0
55	4 33	19 24	0 42	2 49	0 41	1.8	6 23	2.7
50	4 47	19 10	0 36	2 13	0 0	1.9	7 4	2.5
45	4 58	18 58	0 32	1 54	. . . .	.0	7 34	2.4
40	5 8	18 49	0 29	1 41	23 56	1.7	7 56	2.4
35	5 16	18 41	0 27	1 32	23 38	1.8	8 15	2.3
30	5 23	18 34	0 25	1 26	23 22	1.8	8 32	2.3
20	5 35	18 22	0 23	1 17	22 55	2.0	8 59	2.2
10	5 45	18 11	0 22	1 12	22 32	2.0	9 23	2.2
0	5 55	18 1	0 21	1 11	22 11	2.1	9 44	2.1
10	6 4	17 52	0 22	1 11	21 49	2.2	10 6	2.1
20	6 14	17 42	0 23	1 14	21 26	2.3	10 30	2.0
30	6 25	17 30	0 25	1 21	20 60	2.4	10 57	1.9
35	6 32	17 23	0 26	1 25	20 44	2.4	11 13	1.9
40	6 39	17 16	0 28	1 31	20 25	2.5	11 32	1.8
45	6 48	17 7	0 30	1 39	20 3	2.6	11 54	1.8
50	6 58	16 57	0 34	1 49	19 35	2.7	12 23	1.7
55	7 11	16 44	0 38	2 2	18 56	2.9	13 2	1.5
60	7 28	16 27	0 44	2 21	17 50	3.4	14 8	1.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 59.8	.4	15.9	$T_{\overline{m}}$ 3 32	2.1	54.2	14.8
12	2 4.8	$T_{\overline{m}_\odot}$ 11 h 57.9 min		Starost 18.8 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 15	.1	338	-3.8	♄	5 21	.0	66	-2.2
♂	17 23	.1	246	1.1	♃	20 1	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 32.4	13 34.0	214 21.6	191 17.1	8 10.7	99 27.3	23 25.1
2	210 32.6	13 35.6	244 26.5	221 16.3	8 13.0	129 29.5	23 24.6
4	240 32.8	13 37.2	274 31.5	251 15.5	8 15.3	159 31.7	23 24.1
6	270 33.0	13 38.8	304 36.4	281 14.6	8 17.7	189 33.9	23 23.6
8	300 33.2	13 40.4	334 41.3	311 13.8	8 20.0	219 36.1	23 23.2
10	330 33.4	13 42.0	4 46.3	341 13.0	8 22.3	249 38.3	23 22.7
12	0 33.6	13 43.6	34 51.2	11 12.1	8 24.7	279 40.5	23 22.2
14	30 33.8	13 45.2	64 56.1	41 11.3	8 27.0	309 42.7	23 21.7
16	60 34.0	13 46.8	95 1.0	71 10.5	8 29.3	339 44.9	23 21.2
18	90 34.2	13 48.4	125 6.0	101 9.6	8 31.6	9 47.1	23 20.7
20	120 34.4	13 50.0	155 10.9	131 8.8	8 33.9	39 49.3	23 20.1
22	150 34.6	13 51.6	185 15.8	161 7.9	8 36.3	69 51.5	23 19.6
Δ	1	8		-4	12	11	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	296 26.4	102	-26 58.3	35	280 30.6	-21 38.8	59 58.3	12 33.0
2	325 24.8	102	-26 51.2	38	310 35.3	-21 38.8	90 3.3	12 33.1
4	354 23.2	103	-26 43.6	41	340 40.0	-21 38.8	120 8.3	12 33.1
6	23 21.7	103	-26 35.5	43	10 44.7	-21 38.7	150 13.3	12 33.1
8	52 20.3	104	-26 26.8	46	40 49.4	-21 38.7	180 18.3	12 33.1
10	81 19.0	104	-26 17.7	48	70 54.1	-21 38.7	210 23.3	12 33.1
12	110 17.8	105	-26 8.0	51	100 58.8	-21 38.7	240 28.3	12 33.1
14	139 16.8	105	-25 57.7	54	131 3.6	-21 38.6	270 33.2	12 33.1
16	168 15.8	106	-25 47.0	56	161 8.3	-21 38.6	300 38.2	12 33.1
18	197 15.0	106	-25 35.8	59	191 13.0	-21 38.6	330 43.2	12 33.2
20	226 14.2	107	-25 24.1	61	221 17.7	-21 38.6	0 48.2	12 33.2
22	255 13.7	108	-25 11.8	64	251 22.4	-21 38.6	30 53.2	12 33.2
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 11	19 46	0 51	: ::	2 26	.7	6 26	3.7
55	4 30	19 26	0 42	2 52	1 24	1.2	7 27	3.1
50	4 45	19 12	0 36	2 15	0 46	1.5	8 5	2.9
45	4 57	18 60	0 32	1 55	0 18	1.6	8 32	2.7
40	5 6	18 50	0 29	1 42	. . .	.0	8 54	2.6
35	5 14	18 42	0 27	1 33	. . .	.0	9 11	2.5
30	5 22	18 34	0 25	1 26	. . .	.0	9 27	2.4
20	5 34	18 22	0 23	1 17	23 42	1.8	9 53	2.3
10	5 44	18 11	0 22	1 13	23 21	1.9	10 15	2.2
0	5 54	18 1	0 21	1 11	23 2	2.1	10 36	2.1
10	6 4	17 51	0 22	1 11	22 42	2.2	10 56	2.0
20	6 14	17 41	0 23	1 15	22 21	2.3	11 18	1.9
30	6 26	17 29	0 25	1 21	21 56	2.4	11 44	1.7
35	6 33	17 22	0 26	1 25	21 42	2.5	11 59	1.7
40	6 40	17 15	0 28	1 31	21 25	2.7	12 16	1.6
45	6 49	17 6	0 30	1 39	21 5	2.8	12 37	1.4
50	6 60	16 55	0 34	1 49	20 40	3.0	13 3	1.3
55	7 13	16 42	0 38	2 3	20 5	3.3	13 38	1.0
60	7 30	16 25	0 45	2 22	19 12	3.8	14 32	.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 9.9	.4	15.9	$T_{\overline{m}}$ 4 23	2.1	54.4	14.8
12	2 14.7	$T_{\overline{m}_\odot}$ 11 h 57.8 min		Starost 19.8 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 15	.1	337	-3.8	♃	5 17	.0	66	-2.2
♂	17 21	.1	245	1.2	♄	19 57	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 34.8	13 53.2	215 20.8	191 7.1	8 38.6	99 53.7	23 19.1
2	210 35.0	13 54.8	245 25.7	221 6.2	8 40.9	129 55.9	23 18.6
4	240 35.2	13 56.4	275 30.6	251 5.4	8 43.2	159 58.0	23 18.1
6	270 35.4	13 58.0	305 35.5	281 4.6	8 45.5	190 .2	23 17.6
8	300 35.6	13 59.6	335 40.5	311 3.7	8 47.8	220 2.4	23 17.1
10	330 35.8	14 1.1	5 45.4	341 2.9	8 50.2	250 4.6	23 16.6
12	0 36.0	14 2.7	35 50.3	11 2.0	8 52.5	280 6.8	23 16.1
14	30 36.2	14 4.3	65 55.3	41 1.2	8 54.8	310 9.0	23 15.6
16	60 36.3	14 5.9	96 .2	71 .3	8 57.1	340 11.2	23 15.1
18	90 36.5	14 7.5	126 5.1	100 59.5	8 59.4	10 13.4	23 14.6
20	120 36.7	14 9.0	156 10.0	130 58.6	9 1.7	40 15.6	23 14.1
22	150 36.9	14 10.6	186 15.0	160 57.8	9 4.0	70 17.7	23 13.5
Δ	1	8		-4	12	11	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	284 13.2	108	-24 59.1	66	281 27.1	-21 38.5	60 58.2	12 33.2
2	313 12.9	109	-24 45.9	69	311 31.9	-21 38.5	91 3.1	12 33.2
4	342 12.7	110	-24 32.2	71	341 36.6	-21 38.5	121 8.1	12 33.2
6	11 12.7	111	-24 18.0	73	11 41.3	-21 38.5	151 13.1	12 33.2
8	40 12.8	111	-24 3.3	76	41 46.0	-21 38.5	181 18.1	12 33.2
10	69 13.0	112	-23 48.1	78	71 50.7	-21 38.4	211 23.1	12 33.2
12	98 13.4	113	-23 32.5	81	101 55.5	-21 38.4	241 28.0	12 33.3
14	127 14.0	114	-23 16.4	83	132 .2	-21 38.4	271 33.0	12 33.3
16	156 14.7	114	-22 59.8	85	162 4.9	-21 38.4	301 38.0	12 33.3
18	185 15.6	115	-22 42.8	87	192 9.7	-21 38.4	331 43.0	12 33.3
20	214 16.6	116	-22 25.3	90	222 14.4	-21 38.3	1 48.0	12 33.3
22	243 17.8	117	-22 7.4	92	252 19.1	-21 38.3	31 52.9	12 33.3
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 8	19 49	0 52	: ::	2 41	.3	7 55	3.9
55	4 28	19 28	0 42	2 55	1 53	.8	8 42	3.4
50	4 43	19 13	0 36	2 16	1 21	1.1	9 13	3.1
45	4 55	19 1	0 32	1 55	0 56	1.3	9 37	2.9
40	5 5	18 51	0 29	1 42	0 37	1.4	9 55	2.7
35	5 13	18 42	0 27	1 33	0 20	1.6	10 11	2.6
30	5 21	18 35	0 25	1 26	0 6	1.7	10 25	2.5
20	5 33	18 22	0 23	1 17	. . .	.0	10 47	2.3
10	5 44	18 11	0 22	1 13	. . .	.0	11 7	2.2
0	5 54	18 1	0 21	1 11	23 51	2.0	11 26	2.0
10	6 4	17 51	0 22	1 12	23 34	2.1	11 44	1.9
20	6 15	17 40	0 23	1 15	23 16	2.3	12 3	1.7
30	6 27	17 28	0 25	1 21	22 55	2.5	12 26	1.6
35	6 34	17 21	0 26	1 25	22 43	2.6	12 39	1.5
40	6 41	17 13	0 28	1 31	22 29	2.7	12 54	1.3
45	6 50	17 4	0 30	1 39	22 12	2.9	13 11	1.2
50	7 1	16 53	0 34	1 49	21 51	3.1	13 33	1.0
55	7 15	16 40	0 38	2 3	21 24	3.4	14 2	.7
60	7 32	16 22	0 45	2 22	20 44	3.9	14 42	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 19.4	.4	15.9	$T_{\overline{m}}$ 5 14	2.0	54.9	14.9
12	2 24.0	$T_{\overline{m}_\odot}$ 11 h 57.6 min		Starost 20.8 d		Faza ◑	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 16	.1	336	-3.8	♃	5 13	.0	66	-2.2
♂	17 19	.1	245	1.2	♄	19 53	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 37.1	14 12.2	216 19.9	190 56.9	9 6.3	100 19.9	23 13.0
2	210 37.3	14 13.7	246 24.8	220 56.0	9 8.6	130 22.1	23 12.5
4	240 37.4	14 15.3	276 29.8	250 55.2	9 10.9	160 24.3	23 12.0
6	270 37.6	14 16.9	306 34.7	280 54.3	9 13.2	190 26.5	23 11.5
8	300 37.8	14 18.4	336 39.6	310 53.5	9 15.5	220 28.7	23 11.0
10	330 38.0	14 20.0	6 44.5	340 52.6	9 17.8	250 30.9	23 10.4
12	0 38.2	14 21.6	36 49.5	10 51.7	9 20.1	280 33.0	23 9.9
14	30 38.3	14 23.1	66 54.4	40 50.9	9 22.4	310 35.2	23 9.4
16	60 38.5	14 24.7	96 59.3	70 50.0	9 24.7	340 37.4	23 8.9
18	90 38.7	14 26.2	127 4.3	100 49.1	9 26.9	10 39.6	23 8.4
20	120 38.9	14 27.8	157 9.2	130 48.3	9 29.2	40 41.8	23 7.8
22	150 39.0	14 29.3	187 14.1	160 47.4	9 31.5	70 44.0	23 7.3
Δ	1	8		-4	11	11	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	272 19.1	117	-21 49.0	94	282 23.9	-21 38.3	61 57.9	12 33.3
2	301 20.6	118	-21 30.1	96	312 28.6	-21 38.3	92 2.9	12 33.3
4	330 22.2	119	-21 10.9	98	342 33.3	-21 38.3	122 7.9	12 33.3
6	359 24.0	120	-20 51.2	101	12 38.1	-21 38.2	152 12.8	12 33.3
8	28 25.9	120	-20 31.1	103	42 42.8	-21 38.2	182 17.8	12 33.3
10	57 28.0	121	-20 10.5	105	72 47.5	-21 38.2	212 22.8	12 33.3
12	86 30.2	122	-19 49.6	107	102 52.3	-21 38.2	242 27.7	12 33.3
14	115 32.6	123	-19 28.2	109	132 57.0	-21 38.2	272 32.7	12 33.3
16	144 35.1	123	-19 6.5	111	163 1.8	-21 38.2	302 37.7	12 33.4
18	173 37.7	124	-18 44.3	113	193 6.5	-21 38.1	332 42.7	12 33.4
20	202 40.5	125	-18 21.7	115	223 11.3	-21 38.1	2 47.6	12 33.4
22	231 43.4	125	-17 58.8	117	253 16.0	-21 38.1	32 52.6	12 33.4
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 5	19 51	0 52	: ::	2 49	.1	9 29	3.9
55	4 26	19 30	0 42	2 58	2 13	.6	10 3	3.5
50	4 41	19 15	0 36	2 17	1 47	.9	10 27	3.2
45	4 54	19 2	0 32	1 56	1 28	1.1	10 45	2.9
40	5 4	18 52	0 29	1 43	1 12	1.2	11 0	2.8
35	5 12	18 43	0 27	1 33	0 58	1.4	11 13	2.6
30	5 20	18 36	0 25	1 26	0 46	1.5	11 24	2.5
20	5 33	18 23	0 23	1 18	0 25	1.7	11 43	2.3
10	5 44	18 11	0 22	1 13	0 8	1.8	11 59	2.1
0	5 54	18 1	0 21	1 11	. . ..	.0	12 14	2.0
10	6 4	17 51	0 22	1 12	. . ..	.0	12 29	1.8
20	6 15	17 40	0 23	1 15	. . ..	.0	12 45	1.6
30	6 27	17 27	0 25	1 21	23 55	2.5	13 3	1.4
35	6 34	17 20	0 26	1 26	23 45	2.6	13 14	1.3
40	6 42	17 12	0 28	1 32	23 35	2.8	13 26	1.2
45	6 52	17 3	0 31	1 39	23 22	3.0	13 40	1.0
50	7 3	16 52	0 34	1 49	23 6	3.2	13 57	.8
55	7 16	16 38	0 38	2 3	22 46	3.5	14 18	.5
60	7 35	16 19	0 45	2 22	22 18	3.9	14 48	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 28.5	.4	15.9	$T_{\overline{m}}$ 6 2	2.0	55.4	15.1
12	2 32.8	$T_{\overline{m}_\odot}$ 11 h 57.5 min		Starost 21.8 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 17	.1	335	-3.8	♃	5 10	.0	66	-2.2
♂	17 17	.1	244	1.2	♄	19 49	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 39.2	14 30.9	217 19.0	190 46.5	9 33.8	100 46.1	23 6.8
2	210 39.4	14 32.4	247 24.0	220 45.7	9 36.1	130 48.3	23 6.3
4	240 39.6	14 34.0	277 28.9	250 44.8	9 38.4	160 50.5	23 5.7
6	270 39.7	14 35.5	307 33.8	280 43.9	9 40.6	190 52.7	23 5.2
8	300 39.9	14 37.1	337 38.7	310 43.0	9 42.9	220 54.9	23 4.7
10	330 40.1	14 38.6	7 43.7	340 42.2	9 45.2	250 57.0	23 4.2
12	0 40.2	14 40.2	37 48.6	10 41.3	9 47.5	280 59.2	23 3.6
14	30 40.4	14 41.7	67 53.5	40 40.4	9 49.7	311 1.4	23 3.1
16	60 40.6	14 43.2	97 58.5	70 39.5	9 52.0	341 3.6	23 2.6
18	90 40.7	14 44.8	128 3.4	100 38.6	9 54.3	11 5.7	23 2.0
20	120 40.9	14 46.3	158 8.3	130 37.8	9 56.6	41 7.9	23 1.5
22	150 41.0	14 47.8	188 13.2	160 36.9	9 58.8	71 10.1	23 1.0
Δ	1	8		-4	11	11	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 46.5	126	-17 35.5	119	283 20.8	-21 38.1	62 57.6	12 33.4
2	289 49.6	126	-17 11.8	120	313 25.5	-21 38.1	93 2.5	12 33.4
4	318 52.9	127	-16 47.7	122	343 30.3	-21 38.1	123 7.5	12 33.4
6	347 56.3	127	-16 23.2	124	13 35.0	-21 38.0	153 12.5	12 33.4
8	16 59.7	128	-15 58.4	126	43 39.8	-21 38.0	183 17.4	12 33.4
10	46 3.3	128	-15 33.3	127	73 44.5	-21 38.0	213 22.4	12 33.4
12	75 7.0	129	-15 7.8	129	103 49.3	-21 38.0	243 27.3	12 33.4
14	104 10.8	129	-14 42.0	131	133 54.1	-21 38.0	273 32.3	12 33.4
16	133 14.7	130	-14 15.8	132	163 58.8	-21 38.0	303 37.3	12 33.4
18	162 18.6	130	-13 49.3	134	194 3.6	-21 37.9	333 42.2	12 33.4
20	191 22.6	130	-13 22.5	136	224 8.3	-21 37.9	3 47.2	12 33.4
22	220 26.7	131	-12 55.3	137	254 13.1	-21 37.9	33 52.2	12 33.4
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 3	19 54	0 53	: ::	2 52	.1	11 3	3.9
55	4 24	19 32	0 43	3 2	2 27	.5	11 26	3.5
50	4 39	19 16	0 36	2 18	2 8	.7	11 43	3.2
45	4 52	19 3	0 32	1 57	1 54	.9	11 56	3.0
40	5 2	18 53	0 29	1 43	1 41	1.1	12 7	2.8
35	5 11	18 44	0 27	1 34	1 31	1.2	12 16	2.7
30	5 19	18 36	0 25	1 27	1 22	1.4	12 24	2.5
20	5 32	18 23	0 23	1 18	1 6	1.6	12 38	2.3
10	5 43	18 11	0 22	1 13	0 52	1.8	12 50	2.1
0	5 54	18 1	0 21	1 11	0 39	1.9	13 1	1.9
10	6 4	17 50	0 22	1 12	0 25	2.1	13 12	1.7
20	6 15	17 39	0 23	1 15	0 11	2.3	13 24	1.5
30	6 28	17 26	0 25	1 21	. . ..	.0	13 37	1.3
35	6 35	17 19	0 26	1 26	. . ..	.0	13 45	1.2
40	6 43	17 11	0 28	1 32	. . ..	.0	13 53	1.0
45	6 53	17 1	0 31	1 39	. . ..	.0	14 3	.9
50	7 4	16 50	0 34	1 50	. . ..	.0	14 16	.7
55	7 18	16 36	0 39	2 3	. . ..	.0	14 31	.4
60	7 37	16 17	0 45	2 23	23 52	3.9	14 50	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 37.0	.3	15.9	$T_{\overline{m}}$ 6 50	1.9	56.2	15.3
12	2 41.0	$T_{\overline{m}_\odot}$ 11 h 57.3 min		Starost 22.8 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 17	.1	333	-3.8	♃	5 6	.0	66	-2.2
♂	17 16	.1	243	1.2	♄	19 45	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.2	14 49.4	218 18.2	190 36.0	10 1.1	101 12.3	23 .4
2	210 41.4	14 50.9	248 23.1	220 35.1	10 3.4	131 14.4	22 59.9
4	240 41.5	14 52.4	278 28.0	250 34.2	10 5.6	161 16.6	22 59.4
6	270 41.7	14 54.0	308 33.0	280 33.3	10 7.9	191 18.8	22 58.8
8	300 41.8	14 55.5	338 37.9	310 32.4	10 10.1	221 21.0	22 58.3
10	330 42.0	14 57.0	8 42.8	340 31.5	10 12.4	251 23.1	22 57.7
12	0 42.2	14 58.5	38 47.7	10 30.7	10 14.7	281 25.3	22 57.2
14	30 42.3	15 .0	68 52.7	40 29.8	10 16.9	311 27.5	22 56.7
16	60 42.5	15 1.6	98 57.6	70 28.9	10 19.2	341 29.6	22 56.1
18	90 42.6	15 3.1	129 2.5	100 28.0	10 21.4	11 31.8	22 55.6
20	120 42.8	15 4.6	159 7.5	130 27.1	10 23.7	41 34.0	22 55.0
22	150 42.9	15 6.1	189 12.4	160 26.2	10 25.9	71 36.1	22 54.5
Δ	1	8		-4	11	11	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	249 30.8	131	-12 27.9	139	284 17.9	-21 37.9	63 57.1	12 33.4
2	278 35.0	131	-12 .2	140	314 22.6	-21 37.9	94 2.1	12 33.4
4	307 39.2	131	-11 32.1	142	344 27.4	-21 37.9	124 7.0	12 33.4
6	336 43.4	131	-11 3.8	143	14 32.2	-21 37.9	154 12.0	12 33.4
8	5 47.7	132	-10 35.2	144	44 37.0	-21 37.9	184 16.9	12 33.4
10	34 52.0	132	-10 6.3	146	74 41.7	-21 37.8	214 21.9	12 33.4
12	63 56.3	132	- 9 37.2	147	104 46.5	-21 37.8	244 26.8	12 33.4
14	93 .7	132	- 9 7.8	148	134 51.3	-21 37.8	274 31.8	12 33.4
16	122 5.0	131	- 8 38.1	149	164 56.1	-21 37.8	304 36.8	12 33.4
18	151 9.3	131	- 8 8.2	151	195 .8	-21 37.8	334 41.7	12 33.4
20	180 13.6	131	- 7 38.1	152	225 5.6	-21 37.8	4 46.7	12 33.4
22	209 17.8	131	- 7 7.7	153	255 10.4	-21 37.8	34 51.6	12 33.4
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 60	19 56	0 53	: ::	2 54	.0	12 37	3.9
55	4 21	19 34	0 43	3 6	2 38	.4	12 50	3.6
50	4 38	19 18	0 37	2 20	2 26	.6	12 60	3.3
45	4 50	19 5	0 32	1 57	2 16	.8	13 8	3.1
40	5 1	18 54	0 29	1 44	2 8	1.0	13 14	2.9
35	5 10	18 45	0 27	1 34	2 1	1.2	13 20	2.7
30	5 18	18 37	0 25	1 27	1 54	1.3	13 25	2.6
20	5 31	18 23	0 23	1 18	1 44	1.5	13 33	2.3
10	5 43	18 12	0 22	1 13	1 34	1.7	13 40	2.1
0	5 54	18 1	0 21	1 11	1 25	1.9	13 47	1.9
10	6 4	17 50	0 22	1 12	1 16	2.1	13 54	1.7
20	6 16	17 38	0 23	1 15	1 7	2.3	14 1	1.5
30	6 29	17 25	0 25	1 21	0 56	2.5	14 9	1.3
35	6 36	17 18	0 26	1 26	0 49	2.7	14 13	1.2
40	6 44	17 10	0 28	1 32	0 42	2.8	14 19	1.0
45	6 54	16 60	0 31	1 40	0 33	3.0	14 25	.8
50	7 6	16 48	0 34	1 50	0 23	3.2	14 32	.6
55	7 20	16 33	0 39	2 4	0 10	3.5	14 40	.4
60	7 39	16 14	0 45	2 23	.. ..	.0	14 51	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 45.0	.3	15.9	$T_{\overline{m}}$ 7 36	1.9	57.0	15.5
12	2 48.7	$T_{\overline{m}_\odot}$ 11 h 57.2 min		Starost 23.8 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 18	.1	332	-3.8	♃	5 2	.0	66	-2.2
♂	17 14	.1	243	1.2	♄	19 41	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 43.1	15 7.6	219 17.3	190 25.3	10 28.2	101 38.3	22 53.9
2	210 43.2	15 9.1	249 22.2	220 24.4	10 30.4	131 40.5	22 53.4
4	240 43.4	15 10.6	279 27.2	250 23.5	10 32.6	161 42.7	22 52.9
6	270 43.5	15 12.1	309 32.1	280 22.6	10 34.9	191 44.8	22 52.3
8	300 43.7	15 13.6	339 37.0	310 21.7	10 37.1	221 47.0	22 51.8
10	330 43.8	15 15.1	9 42.0	340 20.7	10 39.4	251 49.2	22 51.2
12	0 43.9	15 16.6	39 46.9	10 19.8	10 41.6	281 51.3	22 50.7
14	30 44.1	15 18.1	69 51.8	40 18.9	10 43.8	311 53.5	22 50.1
16	60 44.2	15 19.6	99 56.7	70 18.0	10 46.1	341 55.6	22 49.6
18	90 44.4	15 21.1	130 1.7	100 17.1	10 48.3	11 57.8	22 49.0
20	120 44.5	15 22.6	160 6.6	130 16.2	10 50.5	41 60.0	22 48.5
22	150 44.7	15 24.1	190 11.5	160 15.3	10 52.8	72 2.1	22 47.9
Δ	1	7		-5	11	11	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 22.0	131	- 6 37.2	154	285 15.2	-21 37.8	64 56.6	12 33.4
2	267 26.2	130	- 6 6.4	155	315 20.0	-21 37.7	95 1.5	12 33.4
4	296 30.2	130	- 5 35.4	156	345 24.8	-21 37.7	125 6.5	12 33.4
6	325 34.3	130	- 5 4.2	157	15 29.5	-21 37.7	155 11.4	12 33.4
8	354 38.2	129	- 4 32.9	158	45 34.3	-21 37.7	185 16.3	12 33.4
10	23 42.1	129	- 4 1.3	159	75 39.1	-21 37.7	215 21.3	12 33.4
12	52 45.8	128	- 3 29.6	159	105 43.9	-21 37.7	245 26.2	12 33.4
14	81 49.5	128	- 2 57.7	160	135 48.7	-21 37.7	275 31.2	12 33.4
16	110 53.0	127	- 2 25.7	161	165 53.5	-21 37.7	305 36.1	12 33.4
18	139 56.4	126	- 1 53.6	161	195 58.3	-21 37.7	335 41.1	12 33.4
20	168 59.7	126	- 1 21.3	162	226 3.1	-21 37.7	5 46.0	12 33.4
22	198 2.8	125	- 0 48.9	163	256 7.9	-21 37.6	35 51.0	12 33.4
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 57	19 59	0 54	: ::	2 55	.0	14 12	4.1
55	4 19	19 36	0 43	3 10	2 47	.4	14 16	3.7
50	4 36	19 19	0 37	2 21	2 41	.6	14 19	3.4
45	4 49	19 6	0 33	1 58	2 36	.8	14 21	3.2
40	4 60	18 55	0 29	1 44	2 32	1.0	14 23	3.0
35	5 9	18 46	0 27	1 34	2 29	1.2	14 25	2.8
30	5 17	18 38	0 25	1 27	2 26	1.3	14 26	2.7
20	5 31	18 24	0 23	1 18	2 20	1.5	14 29	2.4
10	5 43	18 12	0 22	1 13	2 16	1.7	14 31	2.2
0	5 54	18 0	0 21	1 11	2 11	1.9	14 33	2.0
10	6 5	17 49	0 22	1 12	2 7	2.1	14 35	1.8
20	6 16	17 38	0 23	1 15	2 2	2.4	14 37	1.6
30	6 29	17 25	0 25	1 21	1 57	2.6	14 40	1.3
35	6 37	17 17	0 26	1 26	1 54	2.8	14 41	1.2
40	6 45	17 8	0 28	1 32	1 50	2.9	14 43	1.0
45	6 55	16 58	0 31	1 40	1 46	3.1	14 44	.8
50	7 7	16 46	0 34	1 50	1 41	3.3	14 46	.6
55	7 22	16 31	0 39	2 4	1 35	3.6	14 49	.4
60	7 42	16 11	0 46	2 24	1 27	4.0	14 52	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 52.5	.3	15.9	$T_{\overline{m}}$ 8 22	2.0	58.0	15.8
12	2 55.9	$T_{\overline{m}_\odot}$ 11 h 57.1 min		Starost 24.8 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 19	.1	331	-3.8	♃	4 58	.0	66	-2.2
♂	17 12	.1	242	1.2	♄	19 37	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 44.8	15 25.6	220 16.5	190 14.4	10 55.0	102 4.3	22 47.3
2	210 44.9	15 27.1	250 21.4	220 13.4	10 57.2	132 6.5	22 46.8
4	240 45.1	15 28.6	280 26.3	250 12.5	10 59.4	162 8.6	22 46.2
6	270 45.2	15 30.1	310 31.2	280 11.6	11 1.7	192 10.8	22 45.7
8	300 45.3	15 31.6	340 36.2	310 10.7	11 3.9	222 12.9	22 45.1
10	330 45.5	15 33.0	10 41.1	340 9.7	11 6.1	252 15.1	22 44.6
12	0 45.6	15 34.5	40 46.0	10 8.8	11 8.3	282 17.3	22 44.0
14	30 45.7	15 36.0	70 51.0	40 7.9	11 10.5	312 19.4	22 43.4
16	60 45.9	15 37.5	100 55.9	70 7.0	11 12.7	342 21.6	22 42.9
18	90 46.0	15 38.9	131 .8	100 6.0	11 14.9	12 23.7	22 42.3
20	120 46.1	15 40.4	161 5.7	130 5.1	11 17.2	42 25.9	22 41.8
22	150 46.2	15 41.9	191 10.7	160 4.2	11 19.4	72 28.1	22 41.2
Δ	1	7		−5	11	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	227 5.8	124	− 0 16.4	163	286 12.7	−21 37.6	65 55.9	12 33.3
2	256 8.6	123	0 16.2	163	316 17.5	−21 37.6	96 .8	12 33.3
4	285 11.2	122	0 48.9	164	346 22.3	−21 37.6	126 5.8	12 33.3
6	314 13.6	121	1 21.6	164	16 27.1	−21 37.6	156 10.7	12 33.3
8	343 15.9	120	1 54.5	164	46 31.9	−21 37.6	186 15.7	12 33.3
10	12 17.9	119	2 27.3	165	76 36.7	−21 37.6	216 20.6	12 33.3
12	41 19.6	118	3 .2	165	106 41.5	−21 37.6	246 25.5	12 33.3
14	70 21.2	117	3 33.2	165	136 46.3	−21 37.6	276 30.5	12 33.3
16	99 22.5	115	4 6.1	165	166 51.2	−21 37.6	306 35.4	12 33.3
18	128 23.6	114	4 39.1	165	196 56.0	−21 37.6	336 40.3	12 33.3
20	157 24.3	113	5 12.0	165	227 .8	−21 37.6	6 45.3	12 33.3
22	186 24.8	111	5 44.9	164	257 5.6	−21 37.6	36 50.2	12 33.3
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 54	20 1	0 55	: ::	2 55	.0	15 49	4.3
55	4 17	19 38	0 44	3 15	2 56	.4	15 44	3.9
50	4 34	19 21	0 37	2 22	2 56	.7	15 40	3.6
45	4 48	19 7	0 33	1 59	2 56	.9	15 37	3.3
40	4 59	18 56	0 30	1 44	2 56	1.1	15 34	3.1
35	5 8	18 47	0 27	1 35	2 57	1.2	15 32	2.9
30	5 16	18 38	0 25	1 27	2 57	1.4	15 30	2.8
20	5 30	18 24	0 23	1 18	2 57	1.6	15 27	2.5
10	5 42	18 12	0 22	1 13	2 57	1.8	15 23	2.3
0	5 54	18 0	0 21	1 11	2 58	2.0	15 21	2.1
10	6 5	17 49	0 22	1 12	2 58	2.2	15 18	1.9
20	6 16	17 37	0 23	1 15	2 59	2.5	15 15	1.7
30	6 30	17 24	0 25	1 21	2 59	2.7	15 11	1.4
35	6 38	17 16	0 26	1 26	2 60	2.9	15 9	1.3
40	6 46	17 7	0 28	1 32	3 0	3.0	15 7	1.1
45	6 56	16 57	0 31	1 40	3 1	3.2	15 4	.9
50	7 9	16 45	0 34	1 50	3 1	3.5	15 1	.7
55	7 24	16 29	0 39	2 4	3 2	3.8	14 57	.4
60	7 44	16 9	0 46	2 24	3 3	4.2	14 53	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 59.3	.3	15.9	$T_{\overline{m}}$ 9 9	2.1	58.9	16.1
12	3 2.5	$T_{\overline{m}_\odot}$ 11 h 57.0 min		Starost 25.8 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 19	.1	330	−3.8	♃	4 54	.0	66	−2.2
♂	17 10	.1	242	1.2	♄	19 33	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 46.4	15 43.3	221 15.6	190 3.2	11 21.6	102 30.2	22 40.6
2	210 46.5	15 44.8	251 20.5	220 2.3	11 23.8	132 32.4	22 40.1
4	240 46.6	15 46.3	281 25.4	250 1.4	11 26.0	162 34.5	22 39.5
6	270 46.7	15 47.7	311 30.4	280 .4	11 28.2	192 36.7	22 38.9
8	300 46.9	15 49.2	341 35.3	309 59.5	11 30.4	222 38.8	22 38.4
10	330 47.0	15 50.7	11 40.2	339 58.5	11 32.6	252 41.0	22 37.8
12	0 47.1	15 52.1	41 45.2	9 57.6	11 34.8	282 43.2	22 37.2
14	30 47.2	15 53.6	71 50.1	39 56.7	11 36.9	312 45.3	22 36.6
16	60 47.3	15 55.0	101 55.0	69 55.7	11 39.1	342 47.5	22 36.1
18	90 47.5	15 56.5	131 59.9	99 54.8	11 41.3	12 49.6	22 35.5
20	120 47.6	15 57.9	162 4.9	129 53.8	11 43.5	42 51.8	22 34.9
22	150 47.7	15 59.4	192 9.8	159 52.9	11 45.7	72 53.9	22 34.3
Δ	1	7		−5	11	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	215 25.1	110	6 17.8	164	287 10.4	−21 37.5	66 55.1	12 33.3
2	244 25.0	108	6 50.6	164	317 15.2	−21 37.5	97 .1	12 33.3
4	273 24.6	106	7 23.3	163	347 20.0	−21 37.5	127 5.0	12 33.2
6	302 23.9	105	7 56.0	163	17 24.9	−21 37.5	157 9.9	12 33.2
8	331 22.9	103	8 28.6	162	47 29.7	−21 37.5	187 14.9	12 33.2
10	0 21.5	101	9 1.0	162	77 34.5	−21 37.5	217 19.8	12 33.2
12	29 19.8	100	9 33.4	161	107 39.3	−21 37.5	247 24.7	12 33.2
14	58 17.7	98	10 5.5	160	137 44.2	−21 37.5	277 29.7	12 33.2
16	87 15.3	96	10 37.6	159	167 49.0	−21 37.5	307 34.6	12 33.2
18	116 12.4	94	11 9.4	158	197 53.8	−21 37.5	337 39.5	12 33.2
20	145 9.2	92	11 41.1	157	227 58.7	−21 37.5	7 44.4	12 33.2
22	174 5.6	90	12 12.5	156	258 3.5	−21 37.5	37 49.4	12 33.1
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 52	20 4	0 55	: ::	2 56	.1	17 31	4.6
55	4 15	19 40	0 44	3 21	3 5	.5	17 16	4.1
50	4 32	19 22	0 37	2 24	3 12	.8	17 5	3.7
45	4 46	19 8	0 33	1 60	3 17	1.0	16 56	3.5
40	4 57	18 57	0 30	1 45	3 22	1.2	16 49	3.3
35	5 7	18 47	0 27	1 35	3 26	1.3	16 42	3.1
30	5 15	18 39	0 26	1 28	3 29	1.5	16 37	2.9
20	5 30	18 24	0 23	1 18	3 36	1.7	16 27	2.7
10	5 42	18 12	0 22	1 13	3 41	2.0	16 19	2.5
0	5 53	18 0	0 21	1 12	3 47	2.2	16 11	2.3
10	6 5	17 49	0 22	1 12	3 52	2.4	16 3	2.0
20	6 17	17 37	0 23	1 15	3 58	2.6	15 54	1.8
30	6 30	17 23	0 25	1 21	4 5	2.9	15 45	1.6
35	6 38	17 15	0 26	1 26	4 8	3.0	15 40	1.4
40	6 47	17 6	0 28	1 32	4 13	3.2	15 33	1.3
45	6 58	16 56	0 31	1 40	4 18	3.4	15 26	1.1
50	7 10	16 43	0 34	1 50	4 25	3.7	15 18	.8
55	7 26	16 27	0 39	2 5	4 32	4.0	15 7	.5
60	7 47	16 6	0 46	2 24	4 43	4.4	14 53	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 5.7	.2	15.9	$T_{\overline{m}}$ 9 59	2.2	59.8	16.3
12	3 8.6	$T_{\overline{m}_\odot}$ 11 h 56.9 min		Starost 26.8 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 20	.1	329	−3.8	♃	4 51	.0	66	−2.2
♂	17 9	.1	241	1.2	♄	19 29	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.8	16 .8	222 14.7	189 51.9	11 47.9	102 56.1	22 33.8
2	210 47.9	16 2.3	252 19.7	219 51.0	11 50.1	132 58.2	22 33.2
4	240 48.0	16 3.7	282 24.6	249 50.0	11 52.2	163 .4	22 32.6
6	270 48.2	16 5.2	312 29.5	279 49.0	11 54.4	193 2.5	22 32.0
8	300 48.3	16 6.6	342 34.4	309 48.1	11 56.6	223 4.7	22 31.5
10	330 48.4	16 8.0	12 39.4	339 47.1	11 58.8	253 6.8	22 30.9
12	0 48.5	16 9.5	42 44.3	9 46.2	12 .9	283 9.0	22 30.3
14	30 48.6	16 10.9	72 49.2	39 45.2	12 3.1	313 11.1	22 29.7
16	60 48.7	16 12.3	102 54.2	69 44.2	12 5.3	343 13.3	22 29.1
18	90 48.8	16 13.8	132 59.1	99 43.3	12 7.4	13 15.4	22 28.6
20	120 48.9	16 15.2	163 4.0	129 42.3	12 9.6	43 17.6	22 28.0
22	150 49.0	16 16.6	193 8.9	159 41.3	12 11.8	73 19.7	22 27.4
Δ	1	7		−5	11	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	203 1.6	88	12 43.8	155	288 8.3	−21 37.5	67 54.3	12 33.1
2	231 57.2	86	13 14.7	154	318 13.2	−21 37.5	97 59.2	12 33.1
4	260 52.3	84	13 45.5	152	348 18.0	−21 37.5	128 4.1	12 33.1
6	289 47.1	81	14 15.9	151	18 22.8	−21 37.5	158 9.1	12 33.1
8	318 41.3	79	14 46.1	149	48 27.7	−21 37.5	188 14.0	12 33.1
10	347 35.2	77	15 15.9	148	78 32.5	−21 37.5	218 18.9	12 33.1
12	16 28.6	75	15 45.4	146	108 37.3	−21 37.5	248 23.8	12 33.1
14	45 21.6	72	16 14.6	144	138 42.2	−21 37.5	278 28.7	12 33.0
16	74 14.1	70	16 43.4	142	168 47.0	−21 37.5	308 33.7	12 33.0
18	103 6.1	68	17 11.8	140	198 51.9	−21 37.5	338 38.6	12 33.0
20	131 57.7	66	17 39.8	138	228 56.7	−21 37.5	8 43.5	12 33.0
22	160 48.8	63	18 7.3	136	259 1.6	−21 37.5	38 48.4	12 33.0
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 49	20 6	0 56	: ::	2 58	.2	19 21	4.8
55	4 13	19 42	0 44	3 27	3 16	.6	18 54	4.2
50	4 31	19 24	0 37	2 25	3 30	1.0	18 35	3.9
45	4 45	19 10	0 33	2 0	3 41	1.2	18 20	3.6
40	4 56	18 58	0 30	1 45	3 50	1.4	18 7	3.4
35	5 6	18 48	0 27	1 35	3 58	1.6	17 57	3.2
30	5 14	18 40	0 26	1 28	4 5	1.7	17 47	3.1
20	5 29	18 25	0 23	1 19	4 17	1.9	17 31	2.8
10	5 42	18 12	0 22	1 14	4 28	2.2	17 18	2.6
0	5 53	18 0	0 22	1 12	4 39	2.4	17 5	2.5
10	6 5	17 49	0 22	1 12	4 49	2.6	16 52	2.3
20	6 17	17 36	0 23	1 15	5 0	2.8	16 38	2.1
30	6 31	17 22	0 25	1 22	5 13	3.0	16 23	1.8
35	6 39	17 14	0 26	1 26	5 21	3.2	16 14	1.7
40	6 48	17 5	0 28	1 32	5 30	3.3	16 4	1.5
45	6 59	16 54	0 31	1 40	5 40	3.6	15 52	1.3
50	7 12	16 41	0 35	1 51	5 52	3.8	15 38	1.1
55	7 28	16 25	0 39	2 5	6 8	4.2	15 20	.7
60	7 49	16 4	0 46	2 25	6 29	4.8	14 56	.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 11.4	.2	15.9	$T_{\overline{m}}$ 10 52	2.4	60.6	16.5
12	3 14.0	$T_{\overline{m}_\odot}$ 11 h 56.8 min		Starost 27.8 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 21	.1	328	−3.8	♃	4 47	.0	66	−2.2
♂	17 7	.1	241	1.2	♄	19 25	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.1	16 18.0	223 13.9	189 40.4	12 13.9	103 21.9	22 26.8
2	210 49.2	16 19.5	253 18.8	219 39.4	12 16.1	133 24.0	22 26.2
4	240 49.3	16 20.9	283 23.7	249 38.4	12 18.2	163 26.2	22 25.6
6	270 49.4	16 22.3	313 28.7	279 37.4	12 20.4	193 28.3	22 25.0
8	300 49.5	16 23.7	343 33.6	309 36.5	12 22.5	223 30.5	22 24.5
10	330 49.6	16 25.1	13 38.5	339 35.5	12 24.7	253 32.6	22 23.9
12	0 49.7	16 26.5	43 43.4	9 34.5	12 26.8	283 34.8	22 23.3
14	30 49.8	16 28.0	73 48.4	39 33.5	12 29.0	313 36.9	22 22.7
16	60 49.9	16 29.4	103 53.3	69 32.6	12 31.1	343 39.0	22 22.1
18	90 50.0	16 30.8	133 58.2	99 31.6	12 33.3	13 41.2	22 21.5
20	120 50.1	16 32.2	164 3.2	129 30.6	12 35.4	43 43.3	22 20.9
22	150 50.2	16 33.6	194 8.1	159 29.6	12 37.5	73 45.5	22 20.3
Δ	0	7		−5	11	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	189 39.4	61	18 34.5	133	289 6.4	−21 37.5	68 53.3	12 33.0
2	218 29.6	58	19 1.1	131	319 11.3	−21 37.5	98 58.2	12 33.0
4	247 19.3	56	19 27.3	128	349 16.1	−21 37.5	129 3.2	12 32.9
6	276 8.5	54	19 53.0	126	19 21.0	−21 37.5	159 8.1	12 32.9
8	304 57.3	51	20 18.2	123	49 25.8	−21 37.5	189 13.0	12 32.9
10	333 45.6	49	20 42.8	120	79 30.7	−21 37.5	219 17.9	12 32.9
12	2 33.4	47	21 6.9	118	109 35.6	−21 37.5	249 22.8	12 32.9
14	31 20.8	45	21 30.4	115	139 40.4	−21 37.5	279 27.7	12 32.9
16	60 7.7	42	21 53.3	112	169 45.3	−21 37.5	309 32.6	12 32.8
18	88 54.2	40	22 15.6	108	199 50.1	−21 37.5	339 37.5	12 32.8
20	117 40.2	38	22 37.3	105	229 55.0	−21 37.5	9 42.5	12 32.8
22	146 25.8	36	22 58.4	102	259 59.9	−21 37.5	39 47.4	12 32.8
Δ					24	0	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 46	20 9	0 56	: ::	3 2	.4	21 17	4.8
55	4 11	19 44	0 45	3 36	3 31	.9	20 36	4.1
50	4 29	19 25	0 38	2 27	3 52	1.3	20 7	3.7
45	4 43	19 11	0 33	2 1	4 9	1.5	19 46	3.5
40	4 55	18 59	0 30	1 46	4 23	1.7	19 28	3.3
35	5 5	18 49	0 27	1 36	4 35	1.9	19 14	3.2
30	5 14	18 40	0 26	1 28	4 46	2.0	19 1	3.1
20	5 28	18 25	0 23	1 19	5 4	2.2	18 40	2.9
10	5 41	18 12	0 22	1 14	5 20	2.4	18 21	2.8
0	5 53	18 0	0 22	1 12	5 35	2.6	18 4	2.7
10	6 5	17 48	0 22	1 12	5 50	2.7	17 47	2.5
20	6 18	17 36	0 23	1 15	6 7	2.9	17 28	2.4
30	6 32	17 21	0 25	1 22	6 26	3.1	17 7	2.2
35	6 40	17 13	0 26	1 26	6 37	3.2	16 55	2.1
40	6 49	17 4	0 28	1 32	6 50	3.4	16 41	1.9
45	6 60	16 53	0 31	1 40	7 5	3.6	16 24	1.8
50	7 13	16 40	0 35	1 51	7 24	3.8	16 4	1.5
55	7 29	16 23	0 40	2 5	7 49	4.2	15 37	1.2
60	7 51	16 1	0 47	2 25	8 24	4.9	15 0	.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 16.6	.2	15.9	$T_{\overline{m}}$ 11 49	2.6	61.1	16.6
12	3 18.9	$T_{\overline{m}_\odot}$ 11 h 56.7 min		Starost 28.8 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 22	.1	326	−3.8	♃	4 43	.0	66	−2.2
♂	17 5	.1	240	1.3	♄	19 21	.0	206	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 50.3	16 35.0	224 13.0	189 28.6	12 39.7	103 47.6	22 19.7
2	210 50.4	16 36.4	254 17.9	219 27.6	12 41.8	133 49.8	22 19.1
4	240 50.4	16 37.8	284 22.9	249 26.6	12 43.9	163 51.9	22 18.5
6	270 50.5	16 39.2	314 27.8	279 25.6	12 46.1	193 54.0	22 17.9
8	300 50.6	16 40.6	344 32.7	309 24.6	12 48.2	223 56.2	22 17.3
10	330 50.7	16 42.0	14 37.6	339 23.6	12 50.3	253 58.3	22 16.7
12	0 50.8	16 43.3	44 42.6	9 22.6	12 52.4	284 .5	22 16.1
14	30 50.9	16 44.7	74 47.5	39 21.6	12 54.5	314 2.6	22 15.5
16	60 51.0	16 46.1	104 52.4	69 20.6	12 56.7	344 4.7	22 14.9
18	90 51.0	16 47.5	134 57.4	99 19.6	12 58.8	14 6.9	22 14.3
20	120 51.1	16 48.9	165 2.3	129 18.6	13 .9	44 9.0	22 13.7
22	150 51.2	16 50.3	195 7.2	159 17.6	13 3.0	74 11.2	22 13.1
Δ	0	7		−5	11	11	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	175 11.0	34	23 18.7	99	290 4.7	−21 37.5	69 52.3	12 32.8
2	203 55.8	32	23 38.5	95	320 9.6	−21 37.5	99 57.2	12 32.7
4	232 40.2	30	23 57.5	92	350 14.5	−21 37.5	130 2.1	12 32.7
6	261 24.2	28	24 15.8	88	20 19.3	−21 37.5	160 7.0	12 32.7
8	290 7.8	26	24 33.4	84	50 24.2	−21 37.5	190 11.9	12 32.7
10	318 51.1	25	24 50.2	81	80 29.1	−21 37.5	220 16.8	12 32.7
12	347 34.0	23	25 6.3	77	110 34.0	−21 37.5	250 21.7	12 32.6
14	16 16.6	22	25 21.7	73	140 38.8	−21 37.5	280 26.6	12 32.6
16	44 58.9	20	25 36.2	69	170 43.7	−21 37.5	310 31.5	12 32.6
18	73 41.0	19	25 50.0	65	200 48.6	−21 37.5	340 36.4	12 32.6
20	102 22.7	18	26 3.0	61	230 53.5	−21 37.5	10 41.3	12 32.6
22	131 4.2	17	26 15.2	57	260 58.4	−21 37.5	40 46.2	12 32.5
Δ					24	0	25	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 44	20 11	0 57	: ::	3 11	.8	23 12	3.8
55	4 9	19 46	0 45	3 50	3 54	1.5	22 14	3.4
50	4 27	19 27	0 38	2 28	4 24	1.8	21 37	3.2
45	4 42	19 12	0 33	2 2	4 46	2.0	21 10	3.1
40	4 54	19 0	0 30	1 46	5 5	2.2	20 49	3.1
35	5 4	18 50	0 27	1 36	5 21	2.3	20 31	3.0
30	5 13	18 41	0 26	1 28	5 34	2.4	20 16	3.0
20	5 28	18 26	0 23	1 19	5 57	2.5	19 50	2.9
10	5 41	18 12	0 22	1 14	6 18	2.6	19 28	2.8
0	5 53	18 0	0 22	1 12	6 37	2.7	19 7	2.8
10	6 5	17 48	0 22	1 12	6 56	2.8	18 47	2.7
20	6 18	17 35	0 23	1 16	7 17	2.9	18 25	2.6
30	6 32	17 21	0 25	1 22	7 41	3.1	17 59	2.5
35	6 41	17 12	0 27	1 27	7 55	3.1	17 44	2.5
40	6 50	17 3	0 29	1 33	8 11	3.2	17 27	2.4
45	7 1	16 52	0 31	1 41	8 31	3.4	17 6	2.3
50	7 14	16 38	0 35	1 51	8 56	3.5	16 40	2.2
55	7 31	16 21	0 40	2 6	9 30	3.8	16 5	1.9
60	7 54	15 59	0 47	2 26	10 22	4.5	15 12	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 21.3	.2	15.9	$T_{\overline{m}}$ 12 52	2.7	61.3	16.7
12	3 23.3	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost .5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 22	.1	325	−3.8	♃	4 39	.0	66	−2.3
♂	17 4	.1	240	1.3	♄	19 17	.0	206	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.3	16 51.6	225 12.1	189 16.6	13 5.1	104 13.3	22 12.5
2	210 51.4	16 53.0	255 17.1	219 15.6	13 7.2	134 15.4	22 11.9
4	240 51.4	16 54.4	285 22.0	249 14.6	13 9.3	164 17.6	22 11.3
6	270 51.5	16 55.8	315 26.9	279 13.6	13 11.4	194 19.7	22 10.7
8	300 51.6	16 57.1	345 31.9	309 12.6	13 13.5	224 21.8	22 10.1
10	330 51.7	16 58.5	15 36.8	339 11.6	13 15.6	254 24.0	22 9.4
12	0 51.7	16 59.9	45 41.7	9 10.5	13 17.7	284 26.1	22 8.8
14	30 51.8	17 1.2	75 46.6	39 9.5	13 19.8	314 28.3	22 8.2
16	60 51.9	17 2.6	105 51.6	69 8.5	13 21.9	344 30.4	22 7.6
18	90 52.0	17 4.0	135 56.5	99 7.5	13 24.0	14 32.5	22 7.0
20	120 52.0	17 5.3	166 1.4	129 6.5	13 26.1	44 34.7	22 6.4
22	150 52.1	17 6.7	196 6.4	159 5.4	13 28.2	74 36.8	22 5.8
Δ	0	7		−5	10	11	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	159 45.6	16	26 26.5	53	291 3.2	−21 37.5	70 51.1	12 32.5
2	188 26.7	15	26 37.1	49	321 8.1	−21 37.5	100 56.0	12 32.5
4	217 7.6	14	26 46.8	44	351 13.0	−21 37.5	131 .9	12 32.5
6	245 48.4	13	26 55.6	40	21 17.9	−21 37.5	161 5.8	12 32.5
8	274 29.1	13	27 3.7	36	51 22.8	−21 37.5	191 10.7	12 32.4
10	303 9.6	13	27 10.9	32	81 27.7	−21 37.5	221 15.6	12 32.4
12	331 50.2	12	27 17.2	27	111 32.6	−21 37.5	251 20.5	12 32.4
14	0 30.6	12	27 22.7	23	141 37.5	−21 37.5	281 25.4	12 32.4
16	29 11.1	12	27 27.3	19	171 42.4	−21 37.5	311 30.3	12 32.3
18	57 51.5	12	27 31.0	15	201 47.3	−21 37.6	341 35.2	12 32.3
20	86 32.0	13	27 33.9	10	231 52.2	−21 37.6	11 40.1	12 32.3
22	115 12.6	13	27 36.0	6	261 57.1	−21 37.6	41 45.0	12 32.3
Δ					24	0	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 41	20 14	0 58	: ::	3 31	2.0	.. ..	.0
55	4 7	19 47	0 45	: ::	4 30	2.4	23 35	2.3
50	4 26	19 28	0 38	2 30	5 7	2.5	22 54	2.4
45	4 41	19 13	0 33	2 3	5 35	2.6	22 25	2.5
40	4 53	19 1	0 30	1 47	5 57	2.6	22 2	2.6
35	5 3	18 51	0 28	1 36	6 15	2.7	21 43	2.6
30	5 12	18 41	0 26	1 29	6 31	2.7	21 27	2.6
20	5 27	18 26	0 23	1 19	6 57	2.7	20 59	2.7
10	5 41	18 12	0 22	1 14	7 20	2.7	20 36	2.7
0	5 53	18 0	0 22	1 12	7 42	2.8	20 14	2.7
10	6 5	17 48	0 22	1 12	8 4	2.8	19 52	2.8
20	6 18	17 35	0 23	1 16	8 27	2.8	19 28	2.8
30	6 33	17 20	0 25	1 22	8 54	2.8	19 0	2.8
35	6 41	17 11	0 27	1 27	9 10	2.8	18 44	2.8
40	6 51	17 2	0 29	1 33	9 29	2.8	18 25	2.8
45	7 2	16 50	0 31	1 41	9 52	2.8	18 2	2.8
50	7 16	16 37	0 35	1 51	10 21	2.8	17 32	2.9
55	7 33	16 19	0 40	2 6	11 1	2.9	16 52	2.9
60	7 56	15 56	0 47	2 26	12 10	2.8	15 42	2.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 25.3	.1	15.9	$T_{\overline{m}}$ 13 58	2.8	61.2	16.7
12	3 27.1	$T_{\overline{m}_\odot}$ 11 h 56.6 min		Starost 1.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 23	.1	324	−3.8	♃	4 35	.0	66	−2.3
♂	17 2	.1	239	1.3	♄	19 13	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.2	17 8.0	226 11.3	189 4.4	13 30.3	104 38.9	22 5.2
2	210 52.2	17 9.4	256 16.2	219 3.4	13 32.3	134 41.1	22 4.5
4	240 52.3	17 10.7	286 21.1	249 2.3	13 34.4	164 43.2	22 3.9
6	270 52.4	17 12.1	316 26.1	279 1.3	13 36.5	194 45.3	22 3.3
8	300 52.4	17 13.4	346 31.0	309 .3	13 38.6	224 47.5	22 2.7
10	330 52.5	17 14.8	16 35.9	338 59.2	13 40.6	254 49.6	22 2.1
12	0 52.5	17 16.1	46 40.9	8 58.2	13 42.7	284 51.7	22 1.4
14	30 52.6	17 17.5	76 45.8	38 57.2	13 44.8	314 53.9	22 .8
16	60 52.7	17 18.8	106 50.7	68 56.1	13 46.8	344 56.0	22 .2
18	90 52.7	17 20.1	136 55.6	98 55.1	13 48.9	14 58.1	21 59.6
20	120 52.8	17 21.5	167 .6	128 54.0	13 51.0	45 .3	21 58.9
22	150 52.8	17 22.8	197 5.5	158 53.0	13 53.0	75 2.4	21 58.3
Δ	0	7		−5	10	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 53.2	14	27 37.2	2	292 2.0	−21 37.6	71 49.8	12 32.2
2	172 34.0	15	27 37.5	−2	322 6.9	−21 37.6	101 54.7	12 32.2
4	201 14.9	15	27 37.0	−7	352 11.8	−21 37.6	131 59.6	12 32.2
6	229 56.0	16	27 35.7	−11	22 16.7	−21 37.6	162 4.5	12 32.2
8	258 37.3	17	27 33.5	−15	52 21.6	−21 37.6	192 9.4	12 32.1
10	287 18.8	19	27 30.5	−19	82 26.5	−21 37.6	222 14.3	12 32.1
12	316 .5	20	27 26.7	−23	112 31.4	−21 37.6	252 19.2	12 32.1
14	344 42.5	22	27 22.0	−27	142 36.3	−21 37.6	282 24.1	12 32.1
16	13 24.8	23	27 16.6	−31	172 41.2	−21 37.6	312 28.9	12 32.0
18	42 7.5	25	27 10.3	−35	202 46.1	−21 37.6	342 33.8	12 32.0
20	70 50.4	27	27 3.3	−39	232 51.0	−21 37.7	12 38.7	12 32.0
22	99 33.7	28	26 55.5	−43	262 56.0	−21 37.7	42 43.6	12 31.9
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 39	20 16	0 59	: ::	4 20	3.7	0 43	2.0
55	4 5	19 49	0 46	: ::	5 28	3.3	.. ..	.0
50	4 24	19 30	0 38	2 32	6 8	3.1	23 53	1.7
45	4 39	19 15	0 33	2 4	6 37	3.0	23 26	1.9
40	4 52	19 2	0 30	1 47	7 0	3.0	23 4	2.0
35	5 2	18 51	0 28	1 37	7 19	2.9	22 46	2.1
30	5 11	18 42	0 26	1 29	7 35	2.9	22 30	2.2
20	5 27	18 26	0 23	1 19	8 3	2.8	22 4	2.4
10	5 40	18 13	0 22	1 14	8 26	2.7	21 41	2.5
0	5 53	17 60	0 22	1 12	8 48	2.7	21 19	2.6
10	6 5	17 47	0 22	1 13	9 10	2.6	20 58	2.7
20	6 19	17 34	0 23	1 16	9 34	2.5	20 34	2.8
30	6 34	17 19	0 25	1 22	10 2	2.4	20 7	2.9
35	6 42	17 10	0 27	1 27	10 18	2.4	19 51	3.0
40	6 52	17 1	0 29	1 33	10 37	2.3	19 33	3.1
45	7 4	16 49	0 31	1 41	10 60	2.2	19 10	3.2
50	7 17	16 35	0 35	1 52	11 29	2.1	18 41	3.4
55	7 35	16 17	0 40	2 6	12 10	1.8	18 1	3.6
60	7 58	15 54	0 48	2 27	13 18	1.2	16 53	4.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 28.8	.1	15.9	$T_{\overline{m}}$	15 4	2.6	60.7	16.6
12	3 30.3	$T_{\overline{m}_\odot}$	11 h 56.5 min	Starost	2.5 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 24	.1	323	−3.8	♄	4 31	.0	66	−2.3
♂	17 0	.1	238	1.3	♃	19 10	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.9	17 24.1	227 10.4	188 52.0	13 55.1	105 4.5	21 57.7
2	210 52.9	17 25.4	257 15.4	218 50.9	13 57.1	135 6.6	21 57.1
4	240 53.0	17 26.8	287 20.3	248 49.9	13 59.2	165 8.8	21 56.4
6	270 53.1	17 28.1	317 25.2	278 48.8	14 1.2	195 10.9	21 55.8
8	300 53.1	17 29.4	347 30.1	308 47.7	14 3.3	225 13.0	21 55.2
10	330 53.2	17 30.7	17 35.1	338 46.7	14 5.3	255 15.2	21 54.5
12	0 53.2	17 32.1	47 40.0	8 45.6	14 7.3	285 17.3	21 53.9
14	30 53.3	17 33.4	77 44.9	38 44.6	14 9.4	315 19.4	21 53.3
16	60 53.3	17 34.7	107 49.9	68 43.5	14 11.4	345 21.5	21 52.6
18	90 53.3	17 36.0	137 54.8	98 42.5	14 13.5	15 23.7	21 52.0
20	120 53.4	17 37.3	167 59.7	128 41.4	14 15.5	45 25.8	21 51.4
22	150 53.4	17 38.6	198 4.6	158 40.3	14 17.5	75 27.9	21 50.7
Δ	0	7		−5	10	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	128 17.4	30	26 46.9	−47	293 .9	−21 37.7	72 48.5	12 31.9
2	157 1.5	32	26 37.6	−50	323 5.8	−21 37.7	102 53.4	12 31.9
4	185 45.9	35	26 27.6	−54	353 10.7	−21 37.7	132 58.2	12 31.9
6	214 30.8	37	26 16.8	−57	23 15.6	−21 37.7	163 3.1	12 31.8
8	243 16.2	39	26 5.3	−61	53 20.6	−21 37.7	193 8.0	12 31.8
10	272 2.0	41	25 53.1	−64	83 25.5	−21 37.7	223 12.9	12 31.8
12	300 48.3	44	25 40.3	−68	113 30.4	−21 37.7	253 17.8	12 31.7
14	329 35.0	46	25 26.7	−71	143 35.3	−21 37.7	283 22.6	12 31.7
16	358 22.2	49	25 12.5	−74	173 40.3	−21 37.8	313 27.5	12 31.7
18	27 9.9	51	24 57.7	−77	203 45.2	−21 37.8	343 32.4	12 31.7
20	55 58.2	54	24 42.3	−80	233 50.1	−21 37.8	13 37.3	12 31.6
22	84 46.9	56	24 26.2	−83	263 55.1	−21 37.8	43 42.1	12 31.6
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 36	20 18	0 59	: ::	5 49	4.4	1 30	.8
55	4 3	19 51	0 46	: ::	6 47	3.8	0 31	1.4
50	4 23	19 31	0 38	2 33	7 24	3.5	.. ..	.0
45	4 38	19 16	0 34	2 4	7 50	3.3	.. ..	.0
40	4 51	19 3	0 30	1 48	8 11	3.1	23 53	1.6
35	5 1	18 52	0 28	1 37	8 29	3.0	23 37	1.7
30	5 11	18 43	0 26	1 29	8 44	2.9	23 24	1.8
20	5 26	18 27	0 23	1 19	9 10	2.7	23 0	2.0
10	5 40	18 13	0 22	1 14	9 32	2.6	22 40	2.2
0	5 53	17 60	0 22	1 12	9 52	2.5	22 21	2.3
10	6 6	17 47	0 22	1 13	10 13	2.3	22 2	2.5
20	6 19	17 34	0 23	1 16	10 35	2.2	21 41	2.7
30	6 34	17 18	0 25	1 22	10 60	2.0	21 17	2.8
35	6 43	17 10	0 27	1 27	11 15	1.9	21 3	3.0
40	6 53	16 59	0 29	1 33	11 32	1.8	20 47	3.1
45	7 5	16 48	0 31	1 41	11 53	1.6	20 27	3.3
50	7 19	16 34	0 35	1 52	12 18	1.4	20 2	3.5
55	7 37	16 16	0 40	2 7	12 53	1.1	19 28	3.9
60	8 1	15 52	0 48	2 28	13 46	.4	18 36	4.5
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 31.7	.1	15.9	$T_{\overline{m}}$	16 7	2.4	60.1	16.4
12	3 32.9	$T_{\overline{m}_\odot}$	11 h 56.5 min	Starost	3.5 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 25	.1	322	−3.8	♄	4 27	.0	66	−2.3
♂	16 58	.1	238	1.3	♃	19 6	.0	206	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.5	17 39.9	228 9.6	188 39.3	14 19.5	105 30.1	21 50.1
2	210 53.5	17 41.2	258 14.5	218 38.2	14 21.6	135 32.2	21 49.5
4	240 53.6	17 42.5	288 19.4	248 37.1	14 23.6	165 34.3	21 48.8
6	270 53.6	17 43.8	318 24.3	278 36.0	14 25.6	195 36.4	21 48.2
8	300 53.7	17 45.1	348 29.3	308 35.0	14 27.6	225 38.6	21 47.6
10	330 53.7	17 46.4	18 34.2	338 33.9	14 29.6	255 40.7	21 46.9
12	0 53.7	17 47.7	48 39.1	8 32.8	14 31.6	285 42.8	21 46.3
14	30 53.8	17 49.0	78 44.1	38 31.7	14 33.7	315 44.9	21 45.6
16	60 53.8	17 50.3	108 49.0	68 30.7	14 35.7	345 47.1	21 45.0
18	90 53.8	17 51.6	138 53.9	98 29.6	14 37.7	15 49.2	21 44.3
20	120 53.9	17 52.9	168 58.8	128 28.5	14 39.7	45 51.3	21 43.7
22	150 53.9	17 54.1	199 3.8	158 27.4	14 41.7	75 53.4	21 43.0
Δ	0	6		−5	10	11	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	113 36.2	59	24 9.6	−86	293 60.0	−21 37.8	73 47.0	12 31.6
2	142 26.0	62	23 52.3	−89	324 4.9	−21 37.8	103 51.9	12 31.5
4	171 16.3	64	23 34.6	−92	354 9.9	−21 37.8	133 56.8	12 31.5
6	200 7.1	67	23 16.2	−94	24 14.8	−21 37.8	164 1.6	12 31.5
8	228 58.5	70	22 57.4	−97	54 19.7	−21 37.9	194 6.5	12 31.4
10	257 50.4	72	22 38.0	−99	84 24.7	−21 37.9	224 11.4	12 31.4
12	286 42.8	75	22 18.1	−102	114 29.6	−21 37.9	254 16.2	12 31.4
14	315 35.8	78	21 57.8	−104	144 34.6	−21 37.9	284 21.1	12 31.3
16	344 29.3	80	21 37.0	−106	174 39.5	−21 37.9	314 26.0	12 31.3
18	13 23.3	83	21 15.7	−108	204 44.5	−21 37.9	344 30.8	12 31.3
20	42 17.9	85	20 54.0	−111	234 49.4	−21 37.9	14 35.7	12 31.2
22	71 13.0	88	20 31.9	−113	264 54.4	−21 38.0	44 40.6	12 31.2
Δ					25	0	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 34	20 21	1 0	: : :	7 36	4.4	1 49	.3
55	4 1	19 53	0 46	: : :	8 18	3.8	1 5	.9
50	4 21	19 33	0 39	2 35	8 47	3.5	0 35	1.2
45	4 37	19 17	0 34	2 5	9 8	3.2	0 12	1.4
40	4 49	19 4	0 30	1 48	9 26	3.0	. . ..	.0
35	5 0	18 53	0 28	1 37	9 41	2.9	. . ..	.0
30	5 10	18 43	0 26	1 30	9 53	2.8	. . ..	.0
20	5 26	18 27	0 23	1 20	10 15	2.6	23 49	1.8
10	5 40	18 13	0 22	1 14	10 34	2.4	23 33	1.9
0	5 53	17 60	0 22	1 12	10 51	2.2	23 17	2.1
10	6 6	17 47	0 22	1 13	11 9	2.1	23 2	2.3
20	6 19	17 33	0 23	1 16	11 27	1.9	22 45	2.5
30	6 35	17 18	0 25	1 22	11 48	1.7	22 26	2.7
35	6 44	17 9	0 27	1 27	12 1	1.6	22 14	2.8
40	6 54	16 58	0 29	1 33	12 15	1.4	22 1	3.0
45	7 6	16 47	0 32	1 41	12 32	1.2	21 45	3.2
50	7 20	16 32	0 35	1 52	12 52	1.0	21 26	3.4
55	7 38	16 14	0 40	2 7	13 19	.7	21 1	3.7
60	8 3	15 49	0 48	2 28	13 57	.2	20 25	4.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 34.1	.1	15.9	$T_{\overline{m}}$ 17 4	2.2	59.3	16.2
12	3 35.0	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 4.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 26	.1	320	−3.8	♃	4 23	.0	66	−2.3
♂	16 57	.1	237	1.3	♄	19 2	.0	206	.5

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.9	17 55.4	229 8.7	188 26.3	14 43.7	105 55.6	21 42.4
2	210 54.0	17 56.7	259 13.6	218 25.2	14 45.7	135 57.7	21 41.8
4	240 54.0	17 58.0	289 18.6	248 24.1	14 47.6	165 59.8	21 41.1
6	270 54.0	17 59.3	319 23.5	278 23.0	14 49.6	196 1.9	21 40.5
8	300 54.1	18 .5	349 28.4	308 21.9	14 51.6	226 4.0	21 39.8
10	330 54.1	18 1.8	19 33.3	338 20.8	14 53.6	256 6.2	21 39.2
12	0 54.1	18 3.1	49 38.3	8 19.7	14 55.6	286 8.3	21 38.5
14	30 54.1	18 4.3	79 43.2	38 18.6	14 57.6	316 10.4	21 37.9
16	60 54.2	18 5.6	109 48.1	68 17.5	14 59.5	346 12.5	21 37.2
18	90 54.2	18 6.9	139 53.1	98 16.4	15 1.5	16 14.7	21 36.5
20	120 54.2	18 8.1	169 58.0	128 15.3	15 3.5	46 16.8	21 35.9
22	150 54.2	18 9.4	200 2.9	158 14.2	15 5.5	76 18.9	21 35.2
Δ	0	6		−5	10	11	−3

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	100 8.6	91	20 9.4	−115	294 59.3	−21 38.0	74 45.4	12 31.2
2	129 4.7	93	19 46.5	−116	325 4.3	−21 38.0	104 50.3	12 31.1
4	158 1.3	96	19 23.2	−118	355 9.2	−21 38.0	134 55.2	12 31.1
6	186 58.4	98	18 59.5	−120	25 14.2	−21 38.0	165 .0	12 31.1
8	215 56.0	101	18 35.5	−122	55 19.1	−21 38.0	195 4.9	12 31.0
10	244 54.1	103	18 11.2	−123	85 24.1	−21 38.1	225 9.8	12 31.0
12	273 52.7	105	17 46.5	−125	115 29.0	−21 38.1	255 14.6	12 31.0
14	302 51.8	108	17 21.6	−126	145 34.0	−21 38.1	285 19.5	12 30.9
16	331 51.3	110	16 56.3	−128	175 39.0	−21 38.1	315 24.3	12 30.9
18	0 51.3	112	16 30.8	−129	205 43.9	−21 38.1	345 29.2	12 30.8
20	29 51.8	114	16 5.0	−130	235 48.9	−21 38.1	15 34.1	12 30.8
22	58 52.6	117	15 38.9	−132	265 53.9	−21 38.2	45 38.9	12 30.8
Δ					25	0	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 31	20 23	1 1	: : :	9 21	4.1	1 57	.1
55	3 59	19 55	0 47	: : :	9 49	3.6	1 26	.6
50	4 19	19 34	0 39	2 37	10 10	3.3	1 3	.9
45	4 35	19 18	0 34	2 6	10 26	3.1	0 46	1.1
40	4 48	19 5	0 30	1 49	10 39	2.9	0 31	1.3
35	4 59	18 54	0 28	1 38	10 50	2.7	0 19	1.4
30	5 9	18 44	0 26	1 30	10 60	2.6	0 8	1.5
20	5 26	18 28	0 24	1 20	11 17	2.4	. . ..	.0
10	5 40	18 13	0 22	1 14	11 31	2.2	. . ..	.0
0	5 53	17 60	0 22	1 12	11 45	2.0	. . ..	.0
10	6 6	17 47	0 22	1 13	11 58	1.8	23 57	2.1
20	6 20	17 33	0 23	1 16	12 12	1.6	23 44	2.3
30	6 36	17 17	0 25	1 22	12 29	1.4	23 30	2.5
35	6 45	17 8	0 27	1 27	12 38	1.3	23 22	2.7
40	6 55	16 57	0 29	1 33	12 49	1.1	23 13	2.8
45	7 7	16 45	0 32	1 42	13 1	1.0	23 1	3.0
50	7 22	16 31	0 35	1 52	13 16	.8	22 48	3.2
55	7 40	16 12	0 41	2 7	13 35	.5	22 30	3.5
60	8 5	15 47	0 48	2 29	14 1	.1	22 7	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 36.0	.1	15.9	$T_{\overline{m}}$ 17 56	2.0	58.4	15.9
12	3 36.6	$T_{\overline{m}_\odot}$ 11 h 56.4 min		Starost 5.5 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 27	.1	319	−3.8	♃	4 19	.0	66	−2.3
♂	16 55	.1	237	1.3	♄	18 58	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.3	18 10.6	230 7.8	188 13.1	15 7.4	106 21.0	21 34.6
2	210 54.3	18 11.9	260 12.8	218 12.0	15 9.4	136 23.1	21 33.9
4	240 54.3	18 13.1	290 17.7	248 10.9	15 11.3	166 25.3	21 33.3
6	270 54.3	18 14.4	320 22.6	278 9.8	15 13.3	196 27.4	21 32.6
8	300 54.3	18 15.6	350 27.6	308 8.7	15 15.3	226 29.5	21 31.9
10	330 54.4	18 16.9	20 32.5	338 7.5	15 17.2	256 31.6	21 31.3
12	0 54.4	18 18.1	50 37.4	8 6.4	15 19.2	286 33.7	21 30.6
14	30 54.4	18 19.4	80 42.3	38 5.3	15 21.1	316 35.9	21 30.0
16	60 54.4	18 20.6	110 47.3	68 4.2	15 23.1	346 38.0	21 29.3
18	90 54.4	18 21.8	140 52.2	98 3.1	15 25.0	16 40.1	21 28.6
20	120 54.4	18 23.1	170 57.1	128 1.9	15 26.9	46 42.2	21 28.0
22	150 54.4	18 24.3	201 2.1	158 .8	15 28.9	76 44.3	21 27.3
Δ	0	6		−6	10	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	87 53.9	119	15 12.6	−133	295 58.8	−21 38.2	75 43.8	12 30.7
2	116 55.7	121	14 46.1	−134	326 3.8	−21 38.2	105 48.6	12 30.7
4	145 57.8	123	14 19.3	−135	356 8.8	−21 38.2	135 53.5	12 30.7
6	175 .3	125	13 52.3	−136	26 13.7	−21 38.2	165 58.3	12 30.6
8	204 3.3	127	13 25.2	−137	56 18.7	−21 38.2	196 3.2	12 30.6
10	233 6.6	128	12 57.8	−138	86 23.7	−21 38.3	226 8.1	12 30.5
12	262 10.3	130	12 30.3	−138	116 28.7	−21 38.3	256 12.9	12 30.5
14	291 14.3	132	12 2.6	−139	146 33.6	−21 38.3	286 17.8	12 30.5
16	320 18.7	134	11 34.8	−140	176 38.6	−21 38.3	316 22.6	12 30.4
18	349 23.4	135	11 6.8	−141	206 43.6	−21 38.3	346 27.5	12 30.4
20	18 28.5	137	10 38.7	−141	236 48.6	−21 38.4	16 32.3	12 30.3
22	47 33.8	138	10 10.5	−142	266 53.6	−21 38.4	46 37.2	12 30.3
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 29	20 26	1 2	: ::	10 58	3.8	2 0	.1
55	3 57	19 57	0 47	: ::	11 16	3.4	1 40	.4
50	4 18	19 36	0 39	2 39	11 29	3.1	1 24	.7
45	4 34	19 19	0 34	2 7	11 40	2.9	1 12	.9
40	4 47	19 6	0 30	1 50	11 49	2.7	1 2	1.1
35	4 59	18 55	0 28	1 38	11 56	2.6	0 53	1.2
30	5 8	18 45	0 26	1 30	12 3	2.5	0 45	1.3
20	5 25	18 28	0 24	1 20	12 14	2.2	0 31	1.6
10	5 39	18 13	0 22	1 15	12 24	2.0	0 19	1.8
0	5 53	17 60	0 22	1 13	12 33	1.9	0 8	1.9
10	6 6	17 47	0 22	1 13	12 42	1.7	. . .	.0
20	6 20	17 32	0 23	1 16	12 52	1.5	. . .	.0
30	6 36	17 16	0 25	1 23	13 3	1.3	. . .	.0
35	6 45	17 7	0 27	1 27	13 9	1.1	. . .	.0
40	6 56	16 56	0 29	1 34	13 16	1.0	. . .	.0
45	7 8	16 44	0 32	1 42	13 25	.8	. . .	.0
50	7 23	16 29	0 35	1 53	13 35	.6	. . .	.0
55	7 42	16 10	0 41	2 8	13 47	.4	23 55	3.3
60	8 7	15 45	0 49	2 29	14 3	.0	23 42	3.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 37.2	.0	15.9	$T_{\overline{m}}$	18 44	1.8	57.5	15.7
12	3 37.6	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost	6.5 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 28	.1	318	−3.8	♃	4 15	.0	66	−2.3
♂	16 53	.1	236	1.3	♄	18 54	.0	206	.5

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.4	18 25.5	231 7.0	187 59.7	15 30.8	106 46.4	21 26.6
2	210 54.5	18 26.8	261 11.9	217 58.5	15 32.7	136 48.6	21 26.0
4	240 54.5	18 28.0	291 16.8	247 57.4	15 34.7	166 50.7	21 25.3
6	270 54.5	18 29.2	321 21.8	277 56.3	15 36.6	196 52.8	21 24.6
8	300 54.5	18 30.4	351 26.7	307 55.1	15 38.5	226 54.9	21 24.0
10	330 54.5	18 31.6	21 31.6	337 54.0	15 40.4	256 57.0	21 23.3
12	0 54.5	18 32.9	51 36.5	7 52.8	15 42.4	286 59.1	21 22.6
14	30 54.5	18 34.1	81 41.5	37 51.7	15 44.3	317 1.3	21 21.9
16	60 54.5	18 35.3	111 46.4	67 50.5	15 46.2	347 3.4	21 21.3
18	90 54.5	18 36.5	141 51.3	97 49.4	15 48.1	17 5.5	21 20.6
20	120 54.5	18 37.7	171 56.3	127 48.3	15 50.0	47 7.6	21 19.9
22	150 54.5	18 38.9	202 1.2	157 47.1	15 51.9	77 9.7	21 19.2
Δ	0	6		−6	10	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	76 39.5	140	9 42.1	−142	296 58.5	−21 38.4	76 42.0	12 30.3
2	105 45.5	141	9 13.6	−143	327 3.5	−21 38.4	106 46.9	12 30.2
4	134 51.8	143	8 45.1	−143	357 8.5	−21 38.4	136 51.7	12 30.2
6	163 58.3	144	8 16.4	−144	27 13.5	−21 38.5	166 56.6	12 30.1
8	193 5.1	145	7 47.7	−144	57 18.5	−21 38.5	197 1.4	12 30.1
10	222 12.2	147	7 18.9	−144	87 23.5	−21 38.5	227 6.2	12 30.1
12	251 19.5	148	6 50.0	−145	117 28.5	−21 38.5	257 11.1	12 30.0
14	280 27.0	149	6 21.1	−145	147 33.5	−21 38.5	287 15.9	12 30.0
16	309 34.8	150	5 52.1	−145	177 38.5	−21 38.6	317 20.8	12 29.9
18	338 42.7	151	5 23.1	−145	207 43.5	−21 38.6	347 25.6	12 29.9
20	7 50.9	152	4 54.1	−145	237 48.5	−21 38.6	17 30.5	12 29.8
22	36 59.3	153	4 25.1	−145	267 53.5	−21 38.6	47 35.3	12 29.8
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 26	20 28	1 3	: ::	12 29	3.6	2 2	.0
55	3 55	19 59	0 47	: ::	12 38	3.3	1 50	.3
50	4 17	19 37	0 39	2 41	12 45	3.0	1 41	.6
45	4 33	19 20	0 34	2 8	12 50	2.8	1 33	.8
40	4 46	19 7	0 31	1 50	12 55	2.6	1 27	.9
35	4 58	18 55	0 28	1 38	12 58	2.5	1 22	1.1
30	5 8	18 45	0 26	1 30	13 2	2.4	1 17	1.2
20	5 25	18 28	0 24	1 20	13 8	2.1	1 9	1.4
10	5 39	18 14	0 22	1 15	13 13	1.9	1 1	1.6
0	5 53	17 60	0 22	1 13	13 17	1.8	0 55	1.8
10	6 6	17 46	0 22	1 13	13 22	1.6	0 48	2.0
20	6 21	17 32	0 23	1 16	13 27	1.4	0 40	2.2
30	6 37	17 16	0 25	1 23	13 33	1.2	0 31	2.4
35	6 46	17 6	0 27	1 27	13 36	1.0	0 26	2.5
40	6 57	16 56	0 29	1 34	13 40	.9	0 21	2.7
45	7 9	16 43	0 32	1 42	13 44	.7	0 14	2.9
50	7 24	16 28	0 36	1 53	13 49	.5	0 6	3.1
55	7 44	16 8	0 41	2 8	13 56	.3	. . .	.0
60	8 10	15 42	0 49	2 30	14 4	.0	. . .	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 38.0	.0	15.9	$T_{\overline{m}}$	19 28	1.7	56.7	15.5
12	3 38.1	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost	7.5 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 28	.1	317	−3.8	♃	4 11	.0	66	−2.3
♂	16 52	.1	236	1.3	♄	18 50	.0	206	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.5	18 40.1	232 6.1	187 45.9	15 53.8	107 11.8	21 18.6
2	210 54.5	18 41.3	262 11.0	217 44.8	15 55.7	137 13.9	21 17.9
4	240 54.5	18 42.5	292 16.0	247 43.6	15 57.6	167 16.1	21 17.2
6	270 54.5	18 43.7	322 20.9	277 42.5	15 59.5	197 18.2	21 16.5
8	300 54.5	18 44.9	352 25.8	307 41.3	16 1.4	227 20.3	21 15.9
10	330 54.5	18 46.1	22 30.8	337 40.2	16 3.3	257 22.4	21 15.2
12	0 54.5	18 47.3	52 35.7	7 39.0	16 5.2	287 24.5	21 14.5
14	30 54.5	18 48.5	82 40.6	37 37.8	16 7.0	317 26.6	21 13.8
16	60 54.5	18 49.7	112 45.5	67 36.7	16 8.9	347 28.7	21 13.1
18	90 54.4	18 50.8	142 50.5	97 35.5	16 10.8	17 30.9	21 12.4
20	120 54.4	18 52.0	172 55.4	127 34.3	16 12.7	47 33.0	21 11.8
22	150 54.4	18 53.2	203 .3	157 33.1	16 14.5	77 35.1	21 11.1
Δ	0	6		−6	9	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	66 7.8	154	3 56.0	−145	297 58.5	−21 38.7	77 40.1	12 29.8
2	95 16.5	154	3 26.9	−145	328 3.5	−21 38.7	107 45.0	12 29.7
4	124 25.4	155	2 57.8	−145	358 8.5	−21 38.7	137 49.8	12 29.7
6	153 34.4	156	2 28.7	−145	28 13.5	−21 38.7	167 54.7	12 29.6
8	182 43.6	156	1 59.7	−145	58 18.5	−21 38.8	197 59.5	12 29.6
10	211 52.8	157	1 30.6	−145	88 23.5	−21 38.8	228 4.3	12 29.5
12	241 2.3	158	1 1.6	−145	118 28.5	−21 38.8	258 9.2	12 29.5
14	270 11.8	158	0 32.6	−145	148 33.5	−21 38.8	288 14.0	12 29.4
16	299 21.4	159	0 3.7	−144	178 38.5	−21 38.8	318 18.8	12 29.4
18	328 31.1	159	− 0 25.2	−144	208 43.5	−21 38.9	348 23.7	12 29.3
20	357 40.9	159	− 0 54.0	−144	238 48.5	−21 38.9	18 28.5	12 29.3
22	26 50.7	160	− 1 22.8	−144	268 53.6	−21 38.9	48 33.3	12 29.3
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 24	20 30	1 4	: : :	13 56	3.5	2 2	.0
55	3 54	20 0	0 48	: : :	13 57	3.2	1 58	.3
50	4 15	19 39	0 39	2 43	13 57	2.9	1 55	.5
45	4 32	19 22	0 34	2 9	13 58	2.7	1 52	.7
40	4 45	19 8	0 31	1 51	13 58	2.6	1 50	.9
35	4 57	18 56	0 28	1 39	13 58	2.4	1 48	1.0
30	5 7	18 46	0 26	1 31	13 58	2.3	1 46	1.1
20	5 24	18 29	0 24	1 20	13 59	2.1	1 43	1.4
10	5 39	18 14	0 22	1 15	13 59	1.9	1 40	1.6
0	5 53	17 60	0 22	1 13	13 60	1.7	1 38	1.7
10	6 6	17 46	0 22	1 13	14 0	1.5	1 35	1.9
20	6 21	17 32	0 23	1 16	14 0	1.3	1 32	2.1
30	6 37	17 15	0 25	1 23	14 1	1.1	1 29	2.3
35	6 47	17 6	0 27	1 28	14 1	1.0	1 27	2.5
40	6 58	16 55	0 29	1 34	14 2	.9	1 25	2.6
45	7 10	16 42	0 32	1 42	14 2	.7	1 23	2.8
50	7 26	16 26	0 36	1 53	14 2	.5	1 20	3.0
55	7 45	16 7	0 41	2 8	14 3	.3	1 16	3.2
60	8 12	15 40	0 49	2 30	14 4	.0	1 12	3.6
S								

UT	SUNCE			MESEC			
	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 38.2	.0	15.9	$T_{\overline{m}}$	20 10	1.7	56.0	15.3
12	3 38.0	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost	8.5 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 29	.1	316	−3.8	♃	4 7	.0	66	−2.3
♂	16 50	.1	235	1.3	♄	18 46	.0	206	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.4	18 54.4	233 5.3	187 32.0	16 16.4	107 37.2	21 10.4
2	210 54.4	18 55.6	263 10.2	217 30.8	16 18.3	137 39.3	21 9.7
4	240 54.4	18 56.7	293 15.1	247 29.6	16 20.1	167 41.4	21 9.0
6	270 54.4	18 57.9	323 20.0	277 28.4	16 22.0	197 43.5	21 8.3
8	300 54.3	18 59.1	353 25.0	307 27.2	16 23.9	227 45.6	21 7.6
10	330 54.3	19 .2	23 29.9	337 26.1	16 25.7	257 47.8	21 6.9
12	0 54.3	19 1.4	53 34.8	7 24.9	16 27.6	287 49.9	21 6.2
14	30 54.3	19 2.6	83 39.8	37 23.7	16 29.4	317 52.0	21 5.6
16	60 54.3	19 3.7	113 44.7	67 22.5	16 31.3	347 54.1	21 4.9
18	90 54.2	19 4.9	143 49.6	97 21.3	16 33.1	17 56.2	21 4.2
20	120 54.2	19 6.0	173 54.5	127 20.1	16 34.9	47 58.3	21 3.5
22	150 54.2	19 7.2	203 59.5	157 18.9	16 36.8	78 .4	21 2.8
Δ	0	6		−6	9	11	−3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	56 .7	160	− 1 51.5	−143	298 58.6	−21 38.9	78 38.2	12 29.2
2	85 10.6	160	− 2 20.2	−143	329 3.6	−21 39.0	108 43.0	12 29.2
4	114 20.7	160	− 2 48.7	−142	359 8.6	−21 39.0	138 47.8	12 29.1
6	143 30.7	160	− 3 17.2	−142	29 13.6	−21 39.0	168 52.7	12 29.1
8	172 40.8	160	− 3 45.6	−141	59 18.7	−21 39.1	198 57.5	12 29.0
10	201 50.9	161	− 4 13.9	−141	89 23.7	−21 39.1	229 2.3	12 29.0
12	231 1.0	160	− 4 42.1	−140	119 28.7	−21 39.1	259 7.2	12 28.9
14	260 11.1	160	− 5 10.2	−140	149 33.7	−21 39.1	289 12.0	12 28.9
16	289 21.2	160	− 5 38.1	−139	179 38.8	−21 39.2	319 16.8	12 28.8
18	318 31.2	160	− 6 6.0	−139	209 43.8	−21 39.2	349 21.6	12 28.8
20	347 41.3	160	− 6 33.7	−138	239 48.8	−21 39.2	19 26.5	12 28.7
22	16 51.3	160	− 7 1.3	−137	269 53.9	−21 39.2	49 31.3	12 28.7
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 22	20 33	1 5	: : :	15 20	3.5	2 3	.0
55	3 52	20 2	0 48	: : :	15 13	3.2	2 6	.3
50	4 14	19 40	0 40	2 45	15 8	2.9	2 8	.5
45	4 31	19 23	0 34	2 10	15 3	2.7	2 10	.7
40	4 45	19 9	0 31	1 51	14 60	2.6	2 11	.9
35	4 56	18 57	0 28	1 39	14 56	2.4	2 13	1.0
30	5 6	18 47	0 26	1 31	14 54	2.3	2 14	1.1
20	5 24	18 29	0 24	1 20	14 49	2.1	2 16	1.4
10	5 39	18 14	0 22	1 15	14 45	1.9	2 18	1.5
0	5 53	17 60	0 22	1 13	14 41	1.7	2 19	1.7
10	6 7	17 46	0 22	1 13	14 37	1.5	2 21	1.9
20	6 21	17 31	0 23	1 16	14 33	1.4	2 23	2.1
30	6 38	17 14	0 25	1 23	14 28	1.2	2 25	2.3
35	6 48	17 5	0 27	1 28	14 26	1.0	2 26	2.4
40	6 59	16 54	0 29	1 34	14 23	.9	2 28	2.6
45	7 12	16 41	0 32	1 42	14 19	.7	2 29	2.7
50	7 27	16 25	0 36	1 53	14 15	.6	2 31	2.9
55	7 47	16 5	0 41	2 9	14 10	.3	2 34	3.2
60	8 14	15 38	0 50	2 31	14 4	.0	2 37	3.5
S								

UT	SUNCE			MESEC			
	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 37.8	.0	15.8	$T_{\overline{m}}$	20 51	1.7	55.4	15.1
12	3 37.3	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost	9.5 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 30	.1	314	−3.8	♃	4 3	.0	66	−2.3
♂	16 48	.1	235	1.4	♄	18 42	.0	206	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 54.2	19 8.3	234 4.4	187 17.7	16 38.6	108 2.5	21 2.1
2	210 54.2	19 9.5	264 9.3	217 16.5	16 40.4	138 4.6	21 1.4
4	240 54.1	19 10.6	294 14.3	247 15.3	16 42.3	168 6.7	21 .7
6	270 54.1	19 11.8	324 19.2	277 14.1	16 44.1	198 8.9	20 60.0
8	300 54.1	19 12.9	354 24.1	307 12.9	16 45.9	228 11.0	20 59.3
10	330 54.0	19 14.0	24 29.0	337 11.7	16 47.7	258 13.1	20 58.6
12	0 54.0	19 15.2	54 34.0	7 10.5	16 49.6	288 15.2	20 57.9
14	30 54.0	19 16.3	84 38.9	37 9.3	16 51.4	318 17.3	20 57.2
16	60 53.9	19 17.4	114 43.8	67 8.1	16 53.2	348 19.4	20 56.5
18	90 53.9	19 18.6	144 48.8	97 6.9	16 55.0	18 21.5	20 55.8
20	120 53.9	19 19.7	174 53.7	127 5.6	16 56.8	48 23.6	20 55.1
22	150 53.8	19 20.8	204 58.6	157 4.4	16 58.6	78 25.7	20 54.4
Δ	0	6		-6	9	11	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	46 1.3	160	-7 28.7	-136	299 58.9	-21 39.3	79 36.1	12 28.6
2	75 11.2	159	-7 56.0	-136	330 3.9	-21 39.3	109 40.9	12 28.6
4	104 21.0	159	-8 23.1	-135	0 9.0	-21 39.3	139 45.8	12 28.5
6	133 30.8	159	-8 50.1	-134	30 14.0	-21 39.4	169 50.6	12 28.5
8	162 40.5	158	-9 16.9	-133	60 19.0	-21 39.4	199 55.4	12 28.4
10	191 50.2	158	-9 43.6	-132	90 24.1	-21 39.4	230 .2	12 28.4
12	220 59.7	157	-10 10.0	-131	120 29.1	-21 39.4	260 5.0	12 28.3
14	250 9.1	157	-10 36.3	-130	150 34.2	-21 39.5	290 9.9	12 28.3
16	279 18.5	156	-11 2.4	-129	180 39.2	-21 39.5	320 14.7	12 28.2
18	308 27.7	156	-11 28.3	-128	210 44.3	-21 39.5	350 19.5	12 28.2
20	337 36.8	155	-11 54.0	-127	240 49.3	-21 39.6	20 24.3	12 28.1
22	6 45.8	154	-12 19.5	-126	270 54.4	-21 39.6	50 29.1	12 28.1
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 19	20 35	1 6	: ::	16 45	3.6	2 3	.0
55	3 50	20 4	0 48	: ::	16 30	3.2	2 13	.4
50	4 12	19 41	0 40	2 48	16 18	2.9	2 21	.6
45	4 30	19 24	0 35	2 11	16 9	2.7	2 27	.8
40	4 44	19 10	0 31	1 52	16 1	2.6	2 32	.9
35	4 56	18 58	0 28	1 40	15 54	2.4	2 37	1.1
30	5 6	18 47	0 26	1 31	15 49	2.3	2 41	1.2
20	5 23	18 30	0 24	1 21	15 39	2.1	2 48	1.4
10	5 39	18 14	0 22	1 15	15 30	1.9	2 55	1.6
0	5 53	17 60	0 22	1 13	15 22	1.8	3 1	1.7
10	6 7	17 46	0 22	1 13	15 14	1.6	3 7	1.9
20	6 22	17 31	0 23	1 17	15 6	1.4	3 13	2.1
30	6 39	17 14	0 25	1 23	14 56	1.2	3 20	2.3
35	6 48	17 4	0 27	1 28	14 51	1.1	3 24	2.4
40	6 60	16 53	0 29	1 34	14 44	1.0	3 29	2.6
45	7 13	16 40	0 32	1 43	14 37	.8	3 35	2.7
50	7 29	16 24	0 36	1 54	14 29	.6	3 42	2.9
55	7 49	16 3	0 41	2 9	14 18	.4	3 50	3.2
60	8 16	15 36	0 50	2 31	14 4	.1	4 1	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 36.9	-.1	15.8	$T_{\overline{m}}$	21 32	1.8	54.9	15.0
12	3 36.2	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost 10.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 31	.1	313	-3.8	♃	3 59	.0	66	-2.3
♂	16 47	.1	234	1.4	♄	18 39	.0	206	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.8	19 21.9	235 3.5	187 3.2	17 .4	108 27.8	20 53.7
2	210 53.8	19 23.1	265 8.5	217 2.0	17 2.2	138 29.9	20 52.9
4	240 53.7	19 24.2	295 13.4	247 .7	17 4.0	168 32.1	20 52.2
6	270 53.7	19 25.3	325 18.3	276 59.5	17 5.8	198 34.2	20 51.5
8	300 53.7	19 26.4	355 23.2	306 58.3	17 7.5	228 36.3	20 50.8
10	330 53.6	19 27.5	25 28.2	336 57.1	17 9.3	258 38.4	20 50.1
12	0 53.6	19 28.6	55 33.1	6 55.8	17 11.1	288 40.5	20 49.4
14	30 53.5	19 29.7	85 38.0	36 54.6	17 12.9	318 42.6	20 48.7
16	60 53.5	19 30.8	115 43.0	66 53.4	17 14.7	348 44.7	20 48.0
18	90 53.4	19 31.9	145 47.9	96 52.1	17 16.4	18 46.8	20 47.3
20	120 53.4	19 33.0	175 52.8	126 50.9	17 18.2	48 48.9	20 46.5
22	150 53.4	19 34.1	205 57.7	156 49.6	17 20.0	78 51.0	20 45.8
Δ	0	6		-6	9	11	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	35 54.7	154	-12 44.7	-125	300 59.4	-21 39.6	80 34.0	12 28.0
2	65 3.4	153	-13 9.8	-124	331 4.5	-21 39.7	110 38.8	12 27.9
4	94 11.9	152	-13 34.6	-123	1 9.5	-21 39.7	140 43.6	12 27.9
6	123 20.4	151	-13 59.2	-122	31 14.6	-21 39.7	170 48.4	12 27.8
8	152 28.6	151	-14 23.6	-121	61 19.6	-21 39.7	200 53.2	12 27.8
10	181 36.7	150	-14 47.7	-119	91 24.7	-21 39.8	230 58.0	12 27.7
12	210 44.7	149	-15 11.5	-118	121 29.7	-21 39.8	261 2.8	12 27.7
14	239 52.4	148	-15 35.1	-117	151 34.8	-21 39.8	291 7.6	12 27.6
16	269 .0	147	-15 58.5	-115	181 39.9	-21 39.9	321 12.5	12 27.6
18	298 7.4	146	-16 21.5	-114	211 44.9	-21 39.9	351 17.3	12 27.5
20	327 14.6	145	-16 44.3	-113	241 50.0	-21 39.9	21 22.1	12 27.5
22	356 21.6	144	-17 6.8	-111	271 55.1	-21 40.0	51 26.9	12 27.4
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 17	20 37	1 7	: ::	18 11	3.7	2 4	.1
55	3 48	20 6	0 49	: ::	17 47	3.2	2 21	.4
50	4 11	19 43	0 40	2 50	17 28	3.0	2 35	.7
45	4 29	19 25	0 35	2 11	17 14	2.7	2 46	.9
40	4 43	19 11	0 31	1 52	17 3	2.6	2 55	1.0
35	4 55	18 58	0 28	1 40	16 53	2.5	3 3	1.2
30	5 5	18 48	0 26	1 31	16 44	2.3	3 10	1.3
20	5 23	18 30	0 24	1 21	16 29	2.2	3 22	1.5
10	5 39	18 14	0 22	1 15	16 16	2.0	3 32	1.6
0	5 53	17 60	0 22	1 13	16 5	1.8	3 42	1.8
10	6 7	17 46	0 22	1 13	15 53	1.7	3 52	2.0
20	6 22	17 31	0 23	1 17	15 40	1.5	4 3	2.1
30	6 39	17 13	0 25	1 23	15 26	1.4	4 15	2.3
35	6 49	17 3	0 27	1 28	15 17	1.2	4 23	2.4
40	7 0	16 52	0 29	1 34	15 8	1.1	4 31	2.6
45	7 14	16 39	0 32	1 43	14 57	1.0	4 40	2.7
50	7 30	16 23	0 36	1 54	14 44	.8	4 52	2.9
55	7 50	16 2	0 42	2 9	14 27	.5	5 7	3.2
60	8 18	15 34	0 50	2 32	14 6	.1	5 26	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 35.4	-.1	15.8	$T_{\overline{m}}$	22 15	1.9	54.5	14.9
12	3 34.4	$T_{\overline{m}_\odot}$	11 h 56.4 min	Starost 11.5 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 32	.1	312	-3.8	♃	3 55	.0	66	-2.3
♂	16 45	.1	233	1.4	♄	18 35	.0	206	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 53.3	19 35.2	236 2.7	186 48.4	17 21.7	108 53.1	20 45.1
2	210 53.3	19 36.3	266 7.6	216 47.2	17 23.5	138 55.2	20 44.4
4	240 53.2	19 37.4	296 12.5	246 45.9	17 25.2	168 57.3	20 43.7
6	270 53.2	19 38.5	326 17.5	276 44.7	17 27.0	198 59.4	20 43.0
8	300 53.1	19 39.6	356 22.4	306 43.4	17 28.7	229 1.5	20 42.2
10	330 53.1	19 40.7	26 27.3	336 42.2	17 30.5	259 3.6	20 41.5
12	0 53.0	19 41.8	56 32.2	6 40.9	17 32.2	289 5.8	20 40.8
14	30 53.0	19 42.8	86 37.2	36 39.6	17 34.0	319 7.9	20 40.1
16	60 52.9	19 43.9	116 42.1	66 38.4	17 35.7	349 10.0	20 39.4
18	90 52.8	19 45.0	146 47.0	96 37.1	17 37.4	19 12.1	20 38.6
20	120 52.8	19 46.1	176 52.0	126 35.9	17 39.2	49 14.2	20 37.9
22	150 52.7	19 47.1	206 56.9	156 34.6	17 40.9	79 16.3	20 37.2
Δ	0	5		-6	9	11	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	25 28.5	143	-17 29.0	-110	302 .1	-21 40.0	81 31.7	12 27.3
2	54 35.1	142	-17 50.9	-108	332 5.2	-21 40.0	111 36.5	12 27.3
4	83 41.5	141	-18 12.5	-107	2 10.3	-21 40.1	141 41.3	12 27.2
6	112 47.7	140	-18 33.8	-105	32 15.3	-21 40.1	171 46.1	12 27.2
8	141 53.7	139	-18 54.8	-103	62 20.4	-21 40.1	201 50.9	12 27.1
10	170 59.5	138	-19 15.5	-102	92 25.5	-21 40.2	231 55.7	12 27.1
12	200 5.0	137	-19 35.8	-100	122 30.6	-21 40.2	262 .5	12 27.0
14	229 10.4	136	-19 55.8	-98	152 35.6	-21 40.2	292 5.3	12 26.9
16	258 15.5	134	-20 15.5	-97	182 40.7	-21 40.3	322 10.1	12 26.9
18	287 20.4	133	-20 34.8	-95	212 45.8	-21 40.3	352 14.9	12 26.8
20	316 25.1	132	-20 53.7	-93	242 50.9	-21 40.3	22 19.7	12 26.8
22	345 29.5	131	-21 12.3	-91	272 55.9	-21 40.4	52 24.5	12 26.7
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 15	20 40	1 8	: ::	19 39	3.7	2 6	.2
55	3 47	20 7	0 49	: ::	19 4	3.2	2 32	.6
50	4 10	19 44	0 40	2 52	18 39	2.9	2 52	.9
45	4 27	19 26	0 35	2 12	18 20	2.7	3 7	1.1
40	4 42	19 12	0 31	1 53	18 5	2.6	3 20	1.2
35	4 54	18 59	0 28	1 40	17 52	2.5	3 31	1.3
30	5 5	18 49	0 26	1 32	17 40	2.4	3 41	1.4
20	5 23	18 30	0 24	1 21	17 21	2.2	3 57	1.6
10	5 38	18 15	0 22	1 15	17 4	2.1	4 12	1.8
0	5 53	18 0	0 22	1 13	16 49	1.9	4 26	1.9
10	6 7	17 46	0 22	1 14	16 33	1.8	4 39	2.0
20	6 23	17 30	0 23	1 17	16 17	1.7	4 54	2.2
30	6 40	17 13	0 26	1 23	15 58	1.5	5 11	2.4
35	6 50	17 3	0 27	1 28	15 47	1.4	5 21	2.5
40	7 1	16 51	0 29	1 35	15 35	1.3	5 33	2.6
45	7 15	16 38	0 32	1 43	15 20	1.2	5 46	2.7
50	7 31	16 21	0 36	1 54	15 2	1.0	6 3	2.9
55	7 52	16 0	0 42	2 10	14 40	.7	6 24	3.2
60	8 21	15 32	0 51	2 33	14 9	.2	6 53	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 33.4	-.1	15.8	$T_{\overline{m}}$	22 60	2.0	54.3	14.8
12	3 32.1	$T_{\overline{m}_\odot}$ 11 h 56.5 min		Starost 12.5 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 33	.1	311	-3.8	♃	3 51	.0	66	-2.3
♂	16 43	.1	233	1.4	♄	18 31	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 52.7	19 48.2	237 1.8	186 33.3	17 42.6	109 18.4	20 36.5
2	210 52.6	19 49.3	267 6.7	216 32.1	17 44.3	139 20.5	20 35.7
4	240 52.5	19 50.3	297 11.7	246 30.8	17 46.1	169 22.6	20 35.0
6	270 52.5	19 51.4	327 16.6	276 29.5	17 47.8	199 24.7	20 34.3
8	300 52.4	19 52.4	357 21.5	306 28.2	17 49.5	229 26.8	20 33.5
10	330 52.4	19 53.5	27 26.5	336 27.0	17 51.2	259 28.9	20 32.8
12	0 52.3	19 54.6	57 31.4	6 25.7	17 52.9	289 31.0	20 32.1
14	30 52.2	19 55.6	87 36.3	36 24.4	17 54.6	319 33.1	20 31.3
16	60 52.2	19 56.7	117 41.2	66 23.1	17 56.3	349 35.2	20 30.6
18	90 52.1	19 57.7	147 46.2	96 21.8	17 58.0	19 37.3	20 29.9
20	120 52.0	19 58.7	177 51.1	126 20.5	17 59.7	49 39.4	20 29.1
22	150 52.0	19 59.8	207 56.0	156 19.3	18 1.4	79 41.5	20 28.4
Δ	0	5		-6	9	11	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	14 33.7	130	-21 30.5	-89	303 1.0	-21 40.4	82 29.3	12 26.7
2	43 37.7	129	-21 48.3	-87	333 6.1	-21 40.5	112 34.1	12 26.6
4	72 41.5	128	-22 5.8	-85	3 11.2	-21 40.5	142 38.9	12 26.5
6	101 45.0	126	-22 22.9	-83	33 16.3	-21 40.5	172 43.7	12 26.5
8	130 48.3	125	-22 39.5	-81	63 21.4	-21 40.6	202 48.5	12 26.4
10	159 51.4	124	-22 55.8	-79	93 26.5	-21 40.6	232 53.3	12 26.4
12	188 54.2	123	-23 11.7	-77	123 31.6	-21 40.6	262 58.1	12 26.3
14	217 56.8	122	-23 27.1	-75	153 36.7	-21 40.7	293 2.9	12 26.2
16	246 59.2	121	-23 42.1	-73	183 41.7	-21 40.7	323 7.7	12 26.2
18	276 1.3	120	-23 56.8	-71	213 46.8	-21 40.7	353 12.5	12 26.1
20	305 3.3	119	-24 10.9	-69	243 51.9	-21 40.8	23 17.3	12 26.0
22	334 5.0	118	-24 24.7	-66	273 57.0	-21 40.8	53 22.1	12 26.0
Δ					25	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 13	20 42	1 9	: ::	21 9	3.6	2 9	.3
55	3 45	20 9	0 50	: ::	20 21	3.0	2 46	.8
50	4 8	19 45	0 40	2 55	19 49	2.8	3 12	1.1
45	4 26	19 27	0 35	2 13	19 26	2.6	3 32	1.3
40	4 41	19 12	0 31	1 53	19 7	2.5	3 49	1.4
35	4 53	18 60	0 28	1 41	18 51	2.4	4 3	1.5
30	5 4	18 49	0 26	1 32	18 37	2.3	4 15	1.6
20	5 22	18 31	0 24	1 21	18 14	2.2	4 36	1.8
10	5 38	18 15	0 22	1 16	17 54	2.1	4 54	1.9
0	5 53	18 0	0 22	1 13	17 36	2.0	5 11	2.0
10	6 8	17 45	0 22	1 14	17 17	1.9	5 28	2.1
20	6 23	17 30	0 23	1 17	16 57	1.8	5 47	2.2
30	6 40	17 12	0 26	1 23	16 35	1.7	6 8	2.4
35	6 51	17 2	0 27	1 28	16 21	1.7	6 20	2.4
40	7 2	16 50	0 29	1 35	16 6	1.6	6 35	2.5
45	7 16	16 37	0 32	1 43	15 48	1.4	6 52	2.7
50	7 32	16 20	0 36	1 54	15 26	1.3	7 13	2.8
55	7 54	15 59	0 42	2 10	14 57	1.0	7 41	3.1
60	8 23	15 30	0 51	2 33	14 15	.5	8 22	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 30.8	-.1	15.8	$T_{\overline{m}}$	23 47	2.1	54.1	14.7
12	3 29.3	$T_{\overline{m}_\odot}$ 11 h 56.5 min		Starost 13.5 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 34	.1	310	-3.8	♃	3 47	.0	66	-2.3
♂	16 42	.1	232	1.4	♄	18 27	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.9	20 .8	238 1.0	186 18.0	18 3.1	109 43.6	20 27.7
2	210 51.8	20 1.9	268 5.9	216 16.7	18 4.7	139 45.7	20 26.9
4	240 51.7	20 2.9	298 10.8	246 15.4	18 6.4	169 47.8	20 26.2
6	270 51.7	20 3.9	328 15.7	276 14.1	18 8.1	199 49.9	20 25.5
8	300 51.6	20 5.0	358 20.7	306 12.8	18 9.8	229 52.0	20 24.7
10	330 51.5	20 6.0	28 25.6	336 11.5	18 11.4	259 54.1	20 24.0
12	0 51.5	20 7.0	58 30.5	6 10.2	18 13.1	289 56.2	20 23.2
14	30 51.4	20 8.0	88 35.4	36 8.9	18 14.8	319 58.3	20 22.5
16	60 51.3	20 9.0	118 40.4	66 7.6	18 16.4	350 .4	20 21.8
18	90 51.2	20 10.1	148 45.3	96 6.3	18 18.1	20 2.5	20 21.0
20	120 51.1	20 11.1	178 50.2	126 5.0	18 19.7	50 4.6	20 20.3
22	150 51.1	20 12.1	208 55.2	156 3.7	18 21.4	80 6.7	20 19.5
Δ	0	5		−7	8	11	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	3 6.5	116	−24 38.0	−64	304 2.1	−21 40.9	83 26.9	12 25.9
2	32 7.8	115	−24 50.8	−62	334 7.2	−21 40.9	113 31.7	12 25.9
4	61 8.9	114	−25 3.2	−60	4 12.3	−21 40.9	143 36.5	12 25.8
6	90 9.8	113	−25 15.1	−57	34 17.4	−21 41.0	173 41.2	12 25.7
8	119 10.5	112	−25 26.6	−55	64 22.5	−21 41.0	203 46.0	12 25.7
10	148 11.0	112	−25 37.6	−53	94 27.7	−21 41.1	233 50.8	12 25.6
12	177 11.3	111	−25 48.1	−50	124 32.8	−21 41.1	263 55.6	12 25.5
14	206 11.4	110	−25 58.2	−48	154 37.9	−21 41.1	294 .4	12 25.5
16	235 11.3	109	−26 7.7	−45	184 43.0	−21 41.2	324 5.2	12 25.4
18	264 11.1	108	−26 16.8	−43	214 48.1	−21 41.2	354 10.0	12 25.3
20	293 10.7	107	−26 25.4	−40	244 53.2	−21 41.2	24 14.8	12 25.3
22	322 10.1	106	−26 33.4	−38	274 58.3	−21 41.3	54 19.5	12 25.2
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 10	20 44	1 10	: ::	22 34	2.9	2 17	.7
55	3 44	20 11	0 50	: ::	21 33	2.6	3 6	1.2
50	4 7	19 47	0 41	2 58	20 56	2.5	3 39	1.5
45	4 26	19 28	0 35	2 14	20 28	2.4	4 3	1.6
40	4 40	19 13	0 31	1 54	20 7	2.3	4 23	1.7
35	4 53	19 1	0 29	1 41	19 49	2.3	4 40	1.8
30	5 4	18 50	0 27	1 32	19 33	2.3	4 54	1.8
20	5 22	18 31	0 24	1 21	19 8	2.2	5 18	1.9
10	5 38	18 15	0 23	1 16	18 45	2.2	5 39	2.0
0	5 53	18 0	0 22	1 13	18 24	2.1	5 59	2.1
10	6 8	17 45	0 22	1 14	18 4	2.1	6 19	2.1
20	6 23	17 30	0 23	1 17	17 42	2.0	6 40	2.2
30	6 41	17 12	0 26	1 23	17 16	2.0	7 5	2.3
35	6 51	17 1	0 27	1 28	17 1	1.9	7 19	2.4
40	7 3	16 50	0 29	1 35	16 44	1.9	7 36	2.4
45	7 17	16 36	0 32	1 43	16 23	1.8	7 56	2.5
50	7 34	16 19	0 36	1 55	15 57	1.7	8 22	2.6
55	7 55	15 57	0 42	2 11	15 21	1.5	8 56	2.8
60	8 25	15 28	0 51	2 34	14 27	1.1	9 50	3.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	3 27.7	−.2	15.8		.. ..	1.0	54.0	14.7
12	3 25.9	$T_{\overline{m}_\odot}$	11 h 56.6 min	Starost 14.5 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 35	.1	308	−3.8	♃	3 43	.0	66	−2.4
♂	16 40	.1	232	1.4	♄	18 23	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.0	20 13.1	239 .1	186 2.3	18 23.0	110 8.9	20 18.8
2	210 50.9	20 14.1	269 5.0	216 1.0	18 24.7	140 11.0	20 18.0
4	240 50.8	20 15.1	299 9.9	245 59.7	18 26.3	170 13.1	20 17.3
6	270 50.7	20 16.1	329 14.9	275 58.4	18 27.9	200 15.2	20 16.5
8	300 50.6	20 17.1	359 19.8	305 57.1	18 29.6	230 17.3	20 15.8
10	330 50.6	20 18.1	29 24.7	335 55.7	18 31.2	260 19.4	20 15.0
12	0 50.5	20 19.1	59 29.7	5 54.4	18 32.8	290 21.5	20 14.3
14	30 50.4	20 20.1	89 34.6	35 53.1	18 34.5	320 23.6	20 13.5
16	60 50.3	20 21.1	119 39.5	65 51.8	18 36.1	350 25.7	20 12.8
18	90 50.2	20 22.1	149 44.4	95 50.4	18 37.7	20 27.8	20 12.0
20	120 50.1	20 23.1	179 49.4	125 49.1	18 39.3	50 29.9	20 11.3
22	150 50.0	20 24.1	209 54.3	155 47.8	18 40.9	80 32.0	20 10.5
Δ	0	5		−7	8	11	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	351 9.4	106	−26 41.0	−35	305 3.4	−21 41.3	84 24.3	12 25.2
2	20 8.6	105	−26 48.1	−33	335 8.6	−21 41.4	114 29.1	12 25.1
4	49 7.6	104	−26 54.7	−30	5 13.7	−21 41.4	144 33.9	12 25.0
6	78 6.4	104	−27 .7	−28	35 18.8	−21 41.5	174 38.7	12 25.0
8	107 5.2	103	−27 6.2	−25	65 23.9	−21 41.5	204 43.5	12 24.9
10	136 3.8	103	−27 11.3	−23	95 29.0	−21 41.5	234 48.2	12 24.8
12	165 2.4	102	−27 15.8	−20	125 34.2	−21 41.6	264 53.0	12 24.8
14	194 .8	102	−27 19.7	−17	155 39.3	−21 41.6	294 57.8	12 24.7
16	222 59.2	101	−27 23.2	−15	185 44.4	−21 41.7	325 2.6	12 24.6
18	251 57.5	101	−27 26.1	−12	215 49.5	−21 41.7	355 7.3	12 24.6
20	280 55.7	101	−27 28.5	−9	245 54.7	−21 41.7	25 12.1	12 24.5
22	309 53.8	101	−27 30.3	−7	275 59.8	−21 41.8	55 16.9	12 24.4
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 8	20 46	1 11	: ::	23 44	1.7	2 34	1.5
55	3 42	20 12	0 50	: ::	22 35	2.0	3 36	1.8
50	4 6	19 48	0 41	3 1	21 54	2.0	4 14	1.9
45	4 25	19 29	0 35	2 15	21 25	2.1	4 42	2.0
40	4 40	19 14	0 31	1 54	21 3	2.1	5 4	2.0
35	4 52	19 1	0 29	1 41	20 44	2.1	5 22	2.0
30	5 3	18 50	0 27	1 32	20 28	2.1	5 38	2.1
20	5 22	18 32	0 24	1 21	20 0	2.1	6 5	2.1
10	5 38	18 15	0 23	1 16	19 37	2.1	6 27	2.1
0	5 53	18 0	0 22	1 13	19 15	2.1	6 49	2.1
10	6 8	17 45	0 22	1 14	18 53	2.1	7 10	2.1
20	6 24	17 29	0 23	1 17	18 30	2.2	7 33	2.2
30	6 42	17 11	0 26	1 24	18 3	2.2	7 60	2.2
35	6 52	17 1	0 27	1 29	17 47	2.2	8 16	2.2
40	7 4	16 49	0 30	1 35	17 28	2.2	8 34	2.2
45	7 18	16 35	0 32	1 44	17 6	2.2	8 56	2.2
50	7 35	16 18	0 36	1 55	16 37	2.2	9 25	2.2
55	7 57	15 56	0 42	2 11	15 58	2.2	10 4	2.3
60	8 27	15 26	0 51	2 34	14 53	2.1	11 9	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	3 24.1	−.2	15.8		0 37	2.1	54.0	14.7
12	3 22.0	$T_{\overline{m}_\odot}$	11 h 56.6 min	Starost 15.5 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 36	.1	307	−3.8	♃	3 39	.0	66	−2.4
♂	16 38	.1	231	1.4	♄	18 19	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.9	20 25.0	239 59.2	185 46.4	18 42.5	110 34.1	20 9.8
2	210 49.8	20 26.0	270 4.2	215 45.1	18 44.1	140 36.2	20 9.0
4	240 49.7	20 27.0	300 9.1	245 43.7	18 45.7	170 38.3	20 8.3
6	270 49.7	20 28.0	330 14.0	275 42.4	18 47.3	200 40.4	20 7.5
8	300 49.6	20 28.9	0 18.9	305 41.1	18 48.9	230 42.5	20 6.7
10	330 49.5	20 29.9	30 23.9	335 39.7	18 50.5	260 44.6	20 6.0
12	0 49.4	20 30.9	60 28.8	5 38.4	18 52.1	290 46.7	20 5.2
14	30 49.3	20 31.8	90 33.7	35 37.0	18 53.7	320 48.8	20 4.5
16	60 49.2	20 32.8	120 38.7	65 35.7	18 55.2	350 50.9	20 3.7
18	90 49.1	20 33.8	150 43.6	95 34.3	18 56.8	20 52.9	20 2.9
20	120 49.0	20 34.7	180 48.5	125 32.9	18 58.4	50 55.0	20 2.2
22	150 48.9	20 35.7	210 53.4	155 31.6	18 59.9	80 57.1	20 1.4
Δ	0	5		−7	8	10	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 51.9	100	−27 31.7	−4	306 4.9	−21 41.8	85 21.7	12 24.4
2	7 50.0	100	−27 32.5	−1	336 10.1	−21 41.9	115 26.5	12 24.3
4	36 48.0	100	−27 32.7	1	6 15.2	−21 41.9	145 31.2	12 24.2
6	65 46.0	100	−27 32.4	4	36 20.3	−21 42.0	175 36.0	12 24.1
8	94 44.0	100	−27 31.6	7	66 25.5	−21 42.0	205 40.8	12 24.1
10	123 42.0	100	−27 30.3	9	96 30.6	−21 42.0	235 45.5	12 24.0
12	152 40.0	100	−27 28.4	12	126 35.8	−21 42.1	265 50.3	12 23.9
14	181 38.0	100	−27 25.9	15	156 40.9	−21 42.1	295 55.1	12 23.9
16	210 36.1	100	−27 23.0	17	186 46.0	−21 42.2	325 59.9	12 23.8
18	239 34.1	101	−27 19.5	20	216 51.2	−21 42.2	356 4.6	12 23.7
20	268 32.3	101	−27 15.5	23	246 56.3	−21 42.3	26 9.4	12 23.7
22	297 30.4	101	−27 10.9	25	277 1.5	−21 42.3	56 14.2	12 23.6
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 6	20 49	1 12	: ::	.. ..	.0	3 11	2.7
55	3 41	20 14	0 51	: ::	23 22	1.4	4 20	2.5
50	4 5	19 49	0 41	3 4	22 43	1.6	5 0	2.4
45	4 24	19 30	0 35	2 16	22 15	1.7	5 29	2.3
40	4 39	19 15	0 31	1 55	21 52	1.8	5 52	2.3
35	4 52	19 2	0 29	1 42	21 34	1.9	6 11	2.3
30	5 3	18 51	0 27	1 33	21 18	1.9	6 27	2.2
20	5 22	18 32	0 24	1 22	20 51	2.0	6 55	2.2
10	5 38	18 16	0 23	1 16	20 28	2.1	7 18	2.2
0	5 53	18 0	0 22	1 14	20 6	2.1	7 40	2.1
10	6 8	17 45	0 22	1 14	19 45	2.2	8 2	2.1
20	6 24	17 29	0 24	1 17	19 22	2.2	8 25	2.1
30	6 42	17 11	0 26	1 24	18 55	2.3	8 52	2.0
35	6 53	17 0	0 27	1 29	18 39	2.4	9 8	2.0
40	7 5	16 48	0 30	1 35	18 20	2.4	9 27	1.9
45	7 19	16 34	0 33	1 44	17 58	2.5	9 50	1.9
50	7 36	16 17	0 37	1 55	17 29	2.6	10 18	1.8
55	7 58	15 55	0 42	2 11	16 50	2.7	10 58	1.7
60	8 29	15 24	0 52	2 35	15 44	3.2	12 5	1.3
S								

UT	SUNCE			MESEC			
	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 19.9	−.2	15.8	$T_{\overline{m}}$ 1 28	2.1	54.0	14.7
12	3 17.6	$T_{\overline{m}_\odot}$ 11 h 56.7 min		Starost 16.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 37	.1	306	−3.8	♃	3 35	.0	66	−2.4
♂	16 37	.1	231	1.4	♄	18 16	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 48.8	20 36.6	240 58.4	185 30.2	19 1.5	110 59.2	20 .6
2	210 48.7	20 37.6	271 3.3	215 28.9	19 3.1	141 1.3	19 59.9
4	240 48.5	20 38.5	301 8.2	245 27.5	19 4.6	171 3.4	19 59.1
6	270 48.4	20 39.5	331 13.2	275 26.1	19 6.2	201 5.5	19 58.3
8	300 48.3	20 40.4	1 18.1	305 24.8	19 7.7	231 7.6	19 57.6
10	330 48.2	20 41.4	31 23.0	335 23.4	19 9.3	261 9.7	19 56.8
12	0 48.1	20 42.3	61 27.9	5 22.0	19 10.8	291 11.8	19 56.0
14	30 48.0	20 43.2	91 32.9	35 20.7	19 12.4	321 13.9	19 55.3
16	60 47.9	20 44.2	121 37.8	65 19.3	19 13.9	351 16.0	19 54.5
18	90 47.8	20 45.1	151 42.7	95 17.9	19 15.4	21 18.1	19 53.7
20	120 47.7	20 46.0	181 47.7	125 16.5	19 17.0	51 20.2	19 52.9
22	150 47.6	20 46.9	211 52.6	155 15.1	19 18.5	81 22.3	19 52.2
Δ	−1	5		−7	8	10	−4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	326 28.6	101	−27 5.8	28	307 6.6	−21 42.4	86 18.9	12 23.5
2	355 26.9	102	−27 .2	31	337 11.8	−21 42.4	116 23.7	12 23.4
4	24 25.3	102	−26 54.0	33	7 16.9	−21 42.5	146 28.5	12 23.4
6	53 23.8	103	−26 47.4	36	37 22.1	−21 42.5	176 33.2	12 23.3
8	82 22.3	103	−26 40.2	39	67 27.2	−21 42.5	206 38.0	12 23.2
10	111 21.0	104	−26 32.5	41	97 32.4	−21 42.6	236 42.8	12 23.2
12	140 19.7	104	−26 24.2	44	127 37.5	−21 42.6	266 47.5	12 23.1
14	169 18.6	105	−26 15.5	46	157 42.7	−21 42.7	296 52.3	12 23.0
16	198 17.6	106	−26 6.2	49	187 47.9	−21 42.7	326 57.1	12 22.9
18	227 16.7	106	−25 56.5	51	217 53.0	−21 42.8	357 1.8	12 22.9
20	256 15.9	107	−25 46.2	54	247 58.2	−21 42.8	27 6.6	12 22.8
22	285 15.3	108	−25 35.5	56	278 3.3	−21 42.9	57 11.3	12 22.7
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 4	20 51	1 13	: ::	0 26	.9	4 16	3.5
55	3 39	20 15	0 51	: ::	23 55	.9	5 19	3.0
50	4 4	19 51	0 41	3 7	23 21	1.2	5 58	2.8
45	4 23	19 31	0 35	2 17	22 55	1.4	6 25	2.6
40	4 38	19 16	0 31	1 55	22 35	1.5	6 47	2.5
35	4 51	19 3	0 29	1 42	22 18	1.6	7 6	2.4
30	5 2	18 52	0 27	1 33	22 4	1.7	7 21	2.4
20	5 21	18 32	0 24	1 22	21 39	1.8	7 47	2.3
10	5 38	18 16	0 23	1 16	21 17	2.0	8 10	2.2
0	5 53	18 0	0 22	1 14	20 57	2.1	8 31	2.1
10	6 8	17 45	0 22	1 14	20 37	2.2	8 52	2.0
20	6 25	17 29	0 24	1 17	20 15	2.3	9 15	1.9
30	6 43	17 10	0 26	1 24	19 50	2.4	9 41	1.8
35	6 54	16 60	0 27	1 29	19 35	2.5	9 56	1.7
40	7 6	16 48	0 30	1 35	19 18	2.6	10 14	1.6
45	7 20	16 33	0 33	1 44	18 57	2.7	10 35	1.5
50	7 37	16 16	0 37	1 55	18 31	2.9	11 2	1.4
55	7 60	15 53	0 43	2 12	17 56	3.1	11 38	1.1
60	8 31	15 22	0 52	2 36	16 59	3.7	12 35	.6
S								

UT	SUNCE			MESEC			
	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 15.2	−.2	15.8	$T_{\overline{m}}$ 2 19	2.1	54.2	14.8
12	3 12.6	$T_{\overline{m}_\odot}$ 11 h 56.8 min		Starost 17.5 d	Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 39	.1	305	−3.8	♃	3 31	.0	66	−2.4
♂	16 35	.1	230	1.4	♄	18 12	.0	205	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 47.4	20 47.9	241 57.5	185 13.8	19 20.0	111 24.4	19 51.4
2	210 47.3	20 48.8	272 2.4	215 12.4	19 21.5	141 26.5	19 50.6
4	240 47.2	20 49.7	302 7.4	245 11.0	19 23.0	171 28.6	19 49.8
6	270 47.1	20 50.6	332 12.3	275 9.6	19 24.6	201 30.7	19 49.1
8	300 47.0	20 51.5	2 17.2	305 8.2	19 26.1	231 32.8	19 48.3
10	330 46.9	20 52.4	32 22.1	335 6.8	19 27.6	261 34.9	19 47.5
12	0 46.7	20 53.4	62 27.1	5 5.4	19 29.1	291 37.0	19 46.7
14	30 46.6	20 54.3	92 32.0	35 4.0	19 30.6	321 39.1	19 46.0
16	60 46.5	20 55.2	122 36.9	65 2.6	19 32.1	351 41.2	19 45.2
18	90 46.4	20 56.1	152 41.9	95 1.2	19 33.5	21 43.3	19 44.4
20	120 46.3	20 57.0	182 46.8	124 59.8	19 35.0	51 45.4	19 43.6
22	150 46.1	20 57.9	212 51.7	154 58.4	19 36.5	81 47.5	19 42.8
Δ	-1	5		-7	7	10	-4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	314 14.9	108	-25 24.2	59	308 8.5	-21 42.9	87 16.1	12 22.6
2	343 14.6	109	-25 12.4	61	338 13.7	-21 43.0	117 20.9	12 22.6
4	12 14.4	110	-25 .2	64	8 18.8	-21 43.0	147 25.6	12 22.5
6	41 14.4	111	-24 47.5	66	38 24.0	-21 43.1	177 30.4	12 22.4
8	70 14.6	112	-24 34.3	68	68 29.2	-21 43.1	207 35.1	12 22.3
10	99 14.9	112	-24 20.6	71	98 34.3	-21 43.2	237 39.9	12 22.3
12	128 15.4	113	-24 6.4	73	128 39.5	-21 43.2	267 44.6	12 22.2
14	157 16.0	114	-23 51.8	75	158 44.7	-21 43.3	297 49.4	12 22.1
16	186 16.9	115	-23 36.7	78	188 49.9	-21 43.3	327 54.2	12 22.0
18	215 17.9	116	-23 21.2	80	218 55.0	-21 43.4	357 58.9	12 22.0
20	244 19.1	117	-23 5.2	82	249 .2	-21 43.4	28 3.7	12 21.9
22	273 20.5	118	-22 48.8	84	279 5.4	-21 43.5	58 8.4	12 21.8
Δ					26	0	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 2	20 53	1 14	: : :	0 47	.4	5 40	3.8
55	3 38	20 17	0 52	: : :	. . .	.0	6 31	3.3
50	4 3	19 52	0 41	3 10	23 49	.9	7 4	3.0
45	4 22	19 32	0 36	2 18	23 28	1.1	7 28	2.8
40	4 37	19 17	0 32	1 56	23 11	1.3	7 48	2.6
35	4 51	19 4	0 29	1 42	22 57	1.4	8 4	2.5
30	5 2	18 52	0 27	1 33	22 44	1.5	8 18	2.4
20	5 21	18 33	0 24	1 22	22 23	1.7	8 42	2.3
10	5 38	18 16	0 23	1 16	22 4	1.8	9 2	2.1
0	5 53	18 0	0 22	1 14	21 47	2.0	9 21	2.0
10	6 9	17 45	0 22	1 14	21 29	2.1	9 40	1.9
20	6 25	17 29	0 24	1 17	21 10	2.3	10 0	1.8
30	6 43	17 10	0 26	1 24	20 48	2.4	10 24	1.6
35	6 54	16 59	0 27	1 29	20 35	2.5	10 37	1.5
40	7 7	16 47	0 30	1 35	20 20	2.7	10 53	1.4
45	7 21	16 32	0 33	1 44	20 2	2.8	11 12	1.2
50	7 39	16 15	0 37	1 56	19 40	3.0	11 35	1.1
55	8 1	15 52	0 43	2 12	19 11	3.3	12 5	.8
60	8 33	15 20	0 52	2 36	18 28	3.8	12 49	.3
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 10.0	-.2	15.8	$T_{\overline{m}}$ 3 9	2.0	54.5	14.9
12	3 7.1	$T_{\overline{m}_\odot}$ 11 h 56.9 min		Starost 18.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 40	.1	303	-3.8	♃	3 27	.0	66	-2.4
♂	16 33	.1	229	1.4	♄	18 8	.0	205	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 46.0	20 58.7	242 56.6	184 57.0	19 38.0	111 49.6	19 42.0
2	210 45.9	20 59.6	273 1.6	214 55.6	19 39.5	141 51.7	19 41.3
4	240 45.8	21 .5	303 6.5	244 54.2	19 40.9	171 53.8	19 40.5
6	270 45.6	21 1.4	333 11.4	274 52.8	19 42.4	201 55.9	19 39.7
8	300 45.5	21 2.3	3 16.4	304 51.4	19 43.9	231 58.0	19 38.9
10	330 45.4	21 3.2	33 21.3	334 49.9	19 45.3	262 .1	19 38.1
12	0 45.2	21 4.1	63 26.2	4 48.5	19 46.8	292 2.2	19 37.3
14	30 45.1	21 4.9	93 31.1	34 47.1	19 48.2	322 4.3	19 36.5
16	60 45.0	21 5.8	123 36.1	64 45.7	19 49.7	352 6.4	19 35.7
18	90 44.9	21 6.7	153 41.0	94 44.3	19 51.1	22 8.4	19 34.9
20	120 44.7	21 7.5	183 45.9	124 42.8	19 52.6	52 10.5	19 34.2
22	150 44.6	21 8.4	213 50.9	154 41.4	19 54.0	82 12.6	19 33.4
Δ	-1	4		-7	7	10	-4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	302 22.0	119	-22 31.9	87	309 10.6	-21 43.5	88 13.2	12 21.7
2	331 23.8	120	-22 14.6	89	339 15.8	-21 43.6	118 17.9	12 21.7
4	0 25.7	121	-21 56.9	91	9 20.9	-21 43.6	148 22.7	12 21.6
6	29 27.8	121	-21 38.7	93	39 26.1	-21 43.7	178 27.4	12 21.5
8	58 30.1	122	-21 20.1	95	69 31.3	-21 43.7	208 32.2	12 21.4
10	87 32.5	123	-21 1.1	97	99 36.5	-21 43.8	238 36.9	12 21.3
12	116 35.2	124	-20 41.7	99	129 41.7	-21 43.8	268 41.7	12 21.3
14	145 38.0	125	-20 21.9	101	159 46.9	-21 43.9	298 46.4	12 21.2
16	174 41.0	126	-20 1.7	103	189 52.1	-21 43.9	328 51.2	12 21.1
18	203 44.2	127	-19 41.2	105	219 57.3	-21 44.0	358 55.9	12 21.0
20	232 47.5	128	-19 20.2	107	250 2.5	-21 44.0	29 .7	12 20.9
22	261 51.0	128	-18 58.8	109	280 7.7	-21 44.1	59 5.4	12 20.9
Δ					26	0	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 0	20 55	1 16	: : :	0 56	.2	7 12	3.8
55	3 36	20 19	0 52	: : :	0 17	.7	7 49	3.4
50	4 2	19 53	0 42	3 14	. . .	.0	8 15	3.1
45	4 21	19 33	0 36	2 19	23 56	1.0	8 35	2.9
40	4 37	19 18	0 32	1 56	23 42	1.1	8 51	2.7
35	4 50	19 4	0 29	1 43	23 31	1.3	9 5	2.6
30	5 1	18 53	0 27	1 33	23 21	1.4	9 16	2.4
20	5 21	18 33	0 24	1 22	23 3	1.6	9 36	2.3
10	5 38	18 16	0 23	1 16	22 48	1.7	9 54	2.1
0	5 53	18 1	0 22	1 14	22 34	1.9	10 10	1.9
10	6 9	17 45	0 22	1 14	22 20	2.1	10 26	1.8
20	6 25	17 29	0 24	1 17	22 4	2.2	10 43	1.6
30	6 44	17 10	0 26	1 24	21 47	2.5	11 2	1.4
35	6 55	16 59	0 28	1 29	21 36	2.6	11 13	1.3
40	7 7	16 46	0 30	1 36	21 24	2.7	11 26	1.2
45	7 22	16 32	0 33	1 44	21 10	2.9	11 41	1.0
50	7 40	16 14	0 37	1 56	20 53	3.1	11 60	.8
55	8 3	15 51	0 43	2 12	20 31	3.4	12 24	.6
60	8 35	15 19	0 53	2 37	19 60	3.8	12 56	.1
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	3 4.2	-.3	15.8	$T_{\overline{m}}$ 3 58	2.0	54.9	15.0
12	3 1.1	$T_{\overline{m}_\odot}$ 11 h 57.0 min		Starost 19.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 41	.1	302	-3.8	♃	3 23	.0	66	-2.4
♂	16 32	.1	229	1.4	♄	18 4	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 44.4	21 9.3	243 55.8	184 40.0	19 55.5	112 14.7	19 32.6
2	210 44.3	21 10.1	274 .7	214 38.5	19 56.9	142 16.8	19 31.8
4	240 44.2	21 11.0	304 5.6	244 37.1	19 58.3	172 18.9	19 31.0
6	270 44.0	21 11.8	334 10.6	274 35.7	19 59.7	202 21.0	19 30.2
8	300 43.9	21 12.7	4 15.5	304 34.2	20 1.2	232 23.1	19 29.4
10	330 43.8	21 13.5	34 20.4	334 32.8	20 2.6	262 25.2	19 28.6
12	0 43.6	21 14.4	64 25.4	4 31.4	20 4.0	292 27.3	19 27.8
14	30 43.5	21 15.2	94 30.3	34 29.9	20 5.4	322 29.4	19 27.0
16	60 43.3	21 16.1	124 35.2	64 28.5	20 6.8	352 31.5	19 26.2
18	90 43.2	21 16.9	154 40.1	94 27.0	20 8.2	22 33.6	19 25.4
20	120 43.1	21 17.8	184 45.1	124 25.6	20 9.6	52 35.7	19 24.6
22	150 42.9	21 18.6	214 50.0	154 24.1	20 11.0	82 37.8	19 23.8
Δ	-1	4		-7	7	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 54.7	129	-18 37.1	110	310 12.8	-21 44.1	89 10.1	12 20.8
2	319 58.5	130	-18 15.0	112	340 18.0	-21 44.2	119 14.9	12 20.7
4	349 2.5	131	-17 52.6	114	10 23.2	-21 44.2	149 19.6	12 20.6
6	18 6.6	131	-17 29.8	116	40 28.4	-21 44.3	179 24.4	12 20.5
8	47 10.9	132	-17 6.6	117	70 33.6	-21 44.3	209 29.1	12 20.5
10	76 15.3	133	-16 43.1	119	100 38.8	-21 44.4	239 33.9	12 20.4
12	105 19.9	134	-16 19.3	121	130 44.1	-21 44.5	269 38.6	12 20.3
14	134 24.6	134	-15 55.1	122	160 49.3	-21 44.5	299 43.3	12 20.2
16	163 29.5	135	-15 30.7	124	190 54.5	-21 44.6	329 48.1	12 20.1
18	192 34.4	135	-15 5.8	126	220 59.7	-21 44.6	359 52.8	12 20.1
20	221 39.5	136	-14 40.7	127	251 4.9	-21 44.7	29 57.6	12 20.0
22	250 44.7	136	-14 15.3	129	281 10.1	-21 44.7	60 2.3	12 19.9
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 59	20 57	1 17	: ::	1 1	.1	8 44	3.8
55	3 35	20 20	0 52	: ::	0 33	.5	9 10	3.4
50	4 1	19 54	0 42	3 18	0 12	.8	9 29	3.1
45	4 20	19 34	0 36	2 20	. . ..	.0	9 44	2.9
40	4 36	19 18	0 32	1 57	. . ..	.0	9 56	2.7
35	4 50	19 5	0 29	1 43	. . ..	.0	10 6	2.6
30	5 1	18 53	0 27	1 34	23 54	1.3	10 15	2.5
20	5 21	18 34	0 24	1 22	23 41	1.5	10 31	2.2
10	5 38	18 17	0 23	1 16	23 30	1.7	10 44	2.1
0	5 53	18 1	0 22	1 14	23 20	1.9	10 56	1.9
10	6 9	17 45	0 22	1 14	23 9	2.0	11 9	1.7
20	6 26	17 28	0 24	1 18	22 58	2.2	11 22	1.5
30	6 45	17 9	0 26	1 24	22 46	2.5	11 37	1.3
35	6 56	16 58	0 28	1 29	22 38	2.6	11 45	1.2
40	7 8	16 46	0 30	1 36	22 30	2.7	11 55	1.1
45	7 23	16 31	0 33	1 44	22 20	2.9	12 6	.9
50	7 41	16 13	0 37	1 56	22 7	3.1	12 20	.7
55	8 4	15 49	0 43	2 13	21 52	3.4	12 37	.4
60	8 37	15 17	0 53	2 37	21 31	3.8	12 60	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 58.0	-.3	15.8	$T_{\overline{m}}$ 4 45	1.9	55.4	15.1
12	2 54.6	$T_{\overline{m}_\odot}$ 11 h 57.1 min		Starost 20.5 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 42	.1	301	-3.8	♃	3 19	.0	66	-2.4
♂	16 30	.1	228	1.4	♄	18 0	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 42.8	21 19.4	244 54.9	184 22.7	20 12.4	112 39.9	19 23.0
2	210 42.6	21 20.3	274 59.9	214 21.2	20 13.8	142 42.0	19 22.2
4	240 42.5	21 21.1	305 4.8	244 19.8	20 15.1	172 44.1	19 21.4
6	270 42.3	21 21.9	335 9.7	274 18.3	20 16.5	202 46.2	19 20.6
8	300 42.2	21 22.7	5 14.6	304 16.8	20 17.9	232 48.2	19 19.8
10	330 42.0	21 23.5	35 19.6	334 15.4	20 19.3	262 50.3	19 19.0
12	0 41.9	21 24.4	65 24.5	4 13.9	20 20.6	292 52.4	19 18.1
14	30 41.7	21 25.2	95 29.4	34 12.4	20 22.0	322 54.5	19 17.3
16	60 41.6	21 26.0	125 34.3	64 11.0	20 23.3	352 56.6	19 16.5
18	90 41.4	21 26.8	155 39.3	94 9.5	20 24.7	22 58.7	19 15.7
20	120 41.3	21 27.6	185 44.2	124 8.0	20 26.1	53 .8	19 14.9
22	150 41.1	21 28.4	215 49.1	154 6.6	20 27.4	83 2.9	19 14.1
Δ	-1	4		-7	7	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	279 50.0	137	-13 49.6	130	311 15.3	-21 44.8	90 7.0	12 19.8
2	308 55.3	137	-13 23.6	131	341 20.5	-21 44.8	120 11.8	12 19.7
4	338 .8	138	-12 57.3	133	11 25.7	-21 44.9	150 16.5	12 19.6
6	7 6.4	138	-12 30.7	134	41 30.9	-21 44.9	180 21.2	12 19.6
8	36 12.0	139	-12 3.8	136	71 36.2	-21 45.0	210 26.0	12 19.5
10	65 17.7	139	-11 36.7	137	101 41.4	-21 45.1	240 30.7	12 19.4
12	94 23.5	139	-11 9.3	138	131 46.6	-21 45.1	270 35.4	12 19.3
14	123 29.3	139	-10 41.7	139	161 51.8	-21 45.2	300 40.2	12 19.2
16	152 35.2	140	-10 13.8	141	191 57.0	-21 45.2	330 44.9	12 19.1
18	181 41.1	140	- 9 45.7	142	222 2.3	-21 45.3	0 49.6	12 19.1
20	210 47.0	140	- 9 17.3	143	252 7.5	-21 45.3	30 54.4	12 19.0
22	239 53.0	140	- 8 48.7	144	282 12.7	-21 45.4	60 59.1	12 18.9
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 57	20 59	1 18	: ::	1 3	.1	10 15	3.8
55	3 34	20 22	0 53	: ::	0 45	.4	10 31	3.4
50	3 60	19 55	0 42	3 23	0 30	.6	10 44	3.1
45	4 20	19 35	0 36	2 21	0 19	.8	10 53	2.9
40	4 36	19 19	0 32	1 57	0 9	1.0	11 1	2.8
35	4 49	19 6	0 29	1 43	0 1	1.2	11 8	2.6
30	5 1	18 54	0 27	1 34	. . ..	.0	11 14	2.5
20	5 21	18 34	0 24	1 22	. . ..	.0	11 24	2.2
10	5 38	18 17	0 23	1 16	. . ..	.0	11 33	2.0
0	5 54	18 1	0 22	1 14	. . ..	.0	11 41	1.9
10	6 9	17 45	0 23	1 14	23 59	2.1	11 50	1.7
20	6 26	17 28	0 24	1 18	23 52	2.3	11 58	1.5
30	6 45	17 9	0 26	1 24	23 45	2.5	12 8	1.3
35	6 56	16 58	0 28	1 29	23 40	2.6	12 14	1.1
40	7 9	16 45	0 30	1 36	23 35	2.8	12 20	1.0
45	7 24	16 30	0 33	1 45	23 29	3.0	12 28	.8
50	7 42	16 12	0 37	1 56	23 22	3.2	12 36	.6
55	8 6	15 48	0 43	2 13	23 14	3.5	12 47	.4
60	8 38	15 16	0 53	2 38	23 2	3.8	13 1	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 51.2	-.3	15.8	$T_{\overline{m}}$ 5 31	1.8	56.1	15.3
12	2 47.6	$T_{\overline{m}_\odot}$ 11 h 57.2 min		Starost 21.5 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 43	.1	299	-3.8	♃	3 14	.0	66	-2.4
♂	16 28	.1	228	1.5	♄	17 57	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 41.0	21 29.2	245 54.1	184 5.1	20 28.7	113 5.0	19 13.3
2	210 40.8	21 30.0	275 59.0	214 3.6	20 30.1	143 7.1	19 12.5
4	240 40.6	21 30.8	306 3.9	244 2.1	20 31.4	173 9.2	19 11.7
6	270 40.5	21 31.6	336 8.8	274 .6	20 32.8	203 11.3	19 10.8
8	300 40.3	21 32.4	6 13.8	303 59.2	20 34.1	233 13.4	19 10.0
10	330 40.2	21 33.2	36 18.7	333 57.7	20 35.4	263 15.5	19 9.2
12	0 40.0	21 34.0	66 23.6	3 56.2	20 36.7	293 17.6	19 8.4
14	30 39.8	21 34.7	96 28.6	33 54.7	20 38.0	323 19.6	19 7.6
16	60 39.7	21 35.5	126 33.5	63 53.2	20 39.4	353 21.7	19 6.7
18	90 39.5	21 36.3	156 38.4	93 51.7	20 40.7	23 23.8	19 5.9
20	120 39.4	21 37.1	186 43.3	123 50.2	20 42.0	53 25.9	19 5.1
22	150 39.2	21 37.9	216 48.3	153 48.7	20 43.3	83 28.0	19 4.3
Δ	-1	4		-7	7	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	268 59.0	140	-8 19.9	145	312 17.9	-21 45.5	91 3.8	12 18.8
2	298 4.9	140	-7 50.8	146	342 23.2	-21 45.5	121 8.5	12 18.7
4	327 10.9	140	-7 21.6	147	12 28.4	-21 45.6	151 13.3	12 18.6
6	356 16.8	140	-6 52.2	148	42 33.6	-21 45.6	181 18.0	12 18.5
8	25 22.8	139	-6 22.5	149	72 38.9	-21 45.7	211 22.7	12 18.5
10	54 28.7	139	-5 52.7	150	102 44.1	-21 45.7	241 27.4	12 18.4
12	83 34.5	139	-5 22.7	151	132 49.3	-21 45.8	271 32.2	12 18.3
14	112 40.3	139	-4 52.5	152	162 54.6	-21 45.9	301 36.9	12 18.2
16	141 46.0	138	-4 22.2	152	192 59.8	-21 45.9	331 41.6	12 18.1
18	170 51.7	138	-3 51.7	153	223 5.1	-21 46.0	1 46.3	12 18.0
20	199 57.3	137	-3 21.0	154	253 10.3	-21 46.0	31 51.1	12 17.9
22	229 2.7	137	-2 50.3	155	283 15.5	-21 46.1	61 55.8	12 17.8
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 55	21 1	1 20	: : :	1 5	.0	11 46	3.9
55	3 33	20 23	0 53	: : :	0 54	.4	11 54	3.5
50	3 59	19 56	0 42	3 28	0 46	.6	11 59	3.2
45	4 19	19 36	0 36	2 21	0 39	.8	12 4	3.0
40	4 35	19 20	0 32	1 58	0 34	1.0	12 7	2.8
35	4 49	19 6	0 29	1 43	0 29	1.1	12 10	2.7
30	5 0	18 55	0 27	1 34	0 25	1.3	12 13	2.5
20	5 20	18 34	0 24	1 22	0 17	1.5	12 18	2.3
10	5 38	18 17	0 23	1 16	0 11	1.7	12 22	2.1
0	5 54	18 1	0 22	1 14	0 5	1.9	12 26	1.9
10	6 10	17 45	0 23	1 14	. . .	.0	12 30	1.7
20	6 26	17 28	0 24	1 18	. . .	.0	12 34	1.5
30	6 46	17 9	0 26	1 24	. . .	.0	12 38	1.3
35	6 57	16 58	0 28	1 29	. . .	.0	12 41	1.1
40	7 10	16 45	0 30	1 36	. . .	.0	12 44	1.0
45	7 25	16 30	0 33	1 45	. . .	.0	12 47	.8
50	7 43	16 11	0 37	1 57	. . .	.0	12 51	.6
55	8 7	15 47	0 43	2 13	. . .	.0	12 56	.3
60	8 40	15 14	0 54	2 39	. . .	.0	13 2	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 44.0	-.3	15.8	$T_{\overline{m}}$ 6 15	1.9	56.9	15.5
12	2 40.1	$T_{\overline{m}_\odot}$ 11 h 57.3 min		Starost 22.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 44	.1	298	-3.8	♃	3 10	.0	66	-2.4
♂	16 27	.1	227	1.5	♄	17 53	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 39.0	21 38.6	246 53.2	183 47.2	20 44.6	113 30.1	19 3.5
2	210 38.9	21 39.4	276 58.1	213 45.7	20 45.9	143 32.2	19 2.6
4	240 38.7	21 40.2	307 3.1	243 44.2	20 47.1	173 34.3	19 1.8
6	270 38.5	21 40.9	337 8.0	273 42.7	20 48.4	203 36.4	19 1.0
8	300 38.4	21 41.7	7 12.9	303 41.2	20 49.7	233 38.5	19 .2
10	330 38.2	21 42.4	37 17.8	333 39.7	20 51.0	263 40.6	18 59.3
12	0 38.0	21 43.2	67 22.8	3 38.2	20 52.3	293 42.7	18 58.5
14	30 37.8	21 43.9	97 27.7	33 36.7	20 53.5	323 44.8	18 57.7
16	60 37.7	21 44.7	127 32.6	63 35.2	20 54.8	353 46.8	18 56.9
18	90 37.5	21 45.4	157 37.6	93 33.7	20 56.1	23 48.9	18 56.0
20	120 37.3	21 46.2	187 42.5	123 32.2	20 57.3	53 51.0	18 55.2
22	150 37.2	21 46.9	217 47.4	153 30.7	20 58.6	83 53.1	18 54.4
Δ	-1	4		-8	6	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	258 8.1	136	-2 19.4	155	313 20.8	-21 46.2	92 .5	12 17.7
2	287 13.4	136	-1 48.3	156	343 26.0	-21 46.2	122 5.2	12 17.7
4	316 18.5	135	-1 17.2	156	13 31.3	-21 46.3	152 10.0	12 17.6
6	345 23.5	134	-0 45.9	157	43 36.5	-21 46.3	182 14.7	12 17.5
8	14 28.4	133	-0 14.5	157	73 41.8	-21 46.4	212 19.4	12 17.4
10	43 33.1	133	0 16.9	158	103 47.0	-21 46.5	242 24.1	12 17.3
12	72 37.6	132	0 48.4	158	133 52.3	-21 46.5	272 28.8	12 17.2
14	101 41.9	131	1 20.0	158	163 57.5	-21 46.6	302 33.5	12 17.1
16	130 46.1	130	1 51.7	159	194 2.8	-21 46.6	332 38.3	12 17.0
18	159 50.0	129	2 23.4	159	224 8.0	-21 46.7	2 43.0	12 16.9
20	188 53.8	128	2 55.1	159	254 13.3	-21 46.8	32 47.7	12 16.9
22	217 57.3	126	3 26.9	159	284 18.5	-21 46.8	62 52.4	12 16.8
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 53	21 3	1 21	: : :	1 5	.0	13 19	4.0
55	3 31	20 24	0 53	: : :	1 2	.4	13 17	3.6
50	3 58	19 58	0 42	3 35	1 0	.6	13 16	3.4
45	4 18	19 37	0 36	2 22	0 58	.8	13 16	3.1
40	4 35	19 21	0 32	1 58	0 57	1.0	13 15	2.9
35	4 48	19 7	0 29	1 44	0 56	1.1	13 14	2.8
30	5 0	18 55	0 27	1 34	0 55	1.3	13 14	2.6
20	5 20	18 35	0 24	1 23	0 53	1.5	13 13	2.4
10	5 38	18 17	0 23	1 17	0 51	1.7	13 12	2.2
0	5 54	18 1	0 22	1 14	0 49	1.9	13 11	2.0
10	6 10	17 45	0 23	1 15	0 48	2.1	13 10	1.8
20	6 27	17 28	0 24	1 18	0 46	2.3	13 9	1.6
30	6 46	17 8	0 26	1 24	0 45	2.6	13 8	1.3
35	6 58	16 57	0 28	1 29	0 44	2.7	13 8	1.2
40	7 10	16 44	0 30	1 36	0 42	2.9	13 7	1.0
45	7 26	16 29	0 33	1 45	0 41	3.1	13 6	.8
50	7 44	16 10	0 37	1 57	0 40	3.3	13 5	.6
55	8 8	15 46	0 44	2 14	0 38	3.6	13 4	.4
60	8 42	15 12	0 54	2 39	0 35	3.9	13 3	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 36.3	-.3	15.8	$T_{\overline{m}}$ 7 0	2.0	57.7	15.7
12	2 32.2	$T_{\overline{m}_\odot}$ 11 h 57.5 min		Starost 23.5 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 45	.1	297	-3.8	♃	3 6	.0	66	-2.4
♂	16 25	.1	227	1.5	♄	17 49	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 37.0	21 47.7	247 52.3	183 29.1	20 59.8	113 55.2	18 53.5
2	210 36.8	21 48.4	277 57.3	213 27.6	21 1.1	143 57.3	18 52.7
4	240 36.6	21 49.1	308 2.2	243 26.1	21 2.3	173 59.4	18 51.9
6	270 36.5	21 49.9	338 7.1	273 24.6	21 3.5	204 1.5	18 51.0
8	300 36.3	21 50.6	8 12.1	303 23.0	21 4.8	234 3.6	18 50.2
10	330 36.1	21 51.3	38 17.0	333 21.5	21 6.0	264 5.7	18 49.4
12	0 35.9	21 52.0	68 21.9	3 20.0	21 7.2	294 7.8	18 48.5
14	30 35.7	21 52.8	98 26.8	33 18.4	21 8.4	324 9.9	18 47.7
16	60 35.6	21 53.5	128 31.8	63 16.9	21 9.7	354 11.9	18 46.9
18	90 35.4	21 54.2	158 36.7	93 15.4	21 10.9	24 14.0	18 46.0
20	120 35.2	21 54.9	188 41.6	123 13.8	21 12.1	54 16.1	18 45.2
22	150 35.0	21 55.6	218 46.6	153 12.3	21 13.3	84 18.2	18 44.3
Δ	-1	4		-8	6	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	247 .6	125	3 58.7	159	314 23.8	-21 46.9	92 57.1	12 16.7
2	276 3.6	124	4 30.5	159	344 29.0	-21 46.9	123 1.8	12 16.6
4	305 6.4	122	5 2.3	159	14 34.3	-21 47.0	153 6.5	12 16.5
6	334 8.8	121	5 34.1	159	44 39.6	-21 47.1	183 11.3	12 16.4
8	3 11.1	120	6 5.9	159	74 44.8	-21 47.1	213 16.0	12 16.3
10	32 13.0	118	6 37.6	158	104 50.1	-21 47.2	243 20.7	12 16.2
12	61 14.6	116	7 9.3	158	134 55.4	-21 47.3	273 25.4	12 16.1
14	90 15.9	115	7 40.9	158	165 .6	-21 47.3	303 30.1	12 16.0
16	119 16.9	113	8 12.5	157	195 5.9	-21 47.4	333 34.8	12 15.9
18	148 17.5	111	8 43.9	157	225 11.2	-21 47.4	3 39.5	12 15.8
20	177 17.8	110	9 15.3	156	255 16.4	-21 47.5	33 44.2	12 15.7
22	206 17.7	108	9 46.5	156	285 21.7	-21 47.6	63 48.9	12 15.6
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 52	21 5	1 22	: ::	1 6	.1	14 55	4.3
55	3 30	20 26	0 54	: ::	1 11	.4	14 45	3.9
50	3 57	19 59	0 43	3 45	1 15	.7	14 37	3.5
45	4 18	19 38	0 36	2 23	1 18	.9	14 31	3.3
40	4 34	19 22	0 32	1 58	1 21	1.1	14 25	3.1
35	4 48	19 8	0 29	1 44	1 23	1.2	14 21	2.9
30	4 60	18 56	0 27	1 34	1 25	1.4	14 17	2.8
20	5 20	18 35	0 24	1 23	1 29	1.6	14 10	2.5
10	5 38	18 18	0 23	1 17	1 32	1.8	14 4	2.3
0	5 54	18 1	0 22	1 14	1 36	2.0	13 58	2.1
10	6 10	17 45	0 23	1 15	1 39	2.2	13 53	1.9
20	6 27	17 28	0 24	1 18	1 42	2.5	13 47	1.7
30	6 47	17 8	0 26	1 24	1 46	2.7	13 40	1.4
35	6 58	16 57	0 28	1 30	1 49	2.9	13 36	1.3
40	7 11	16 44	0 30	1 36	1 51	3.0	13 32	1.1
45	7 27	16 28	0 33	1 45	1 55	3.2	13 27	1.0
50	7 45	16 10	0 37	1 57	1 58	3.5	13 21	.7
55	8 10	15 45	0 44	2 14	2 3	3.8	13 13	.4
60	8 44	15 11	0 54	2 40	2 10	4.2	13 4	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 28.1	-.4	15.8	$T_{\overline{m}}$	7 47	2.0	58.7	16.0
12	2 23.8	$T_{\overline{m}_\odot}$	11 h 57.6 min	Starost 24.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 47	.1	296	-3.8	♃	3 2	.0	67	-2.4
♂	16 23	.1	226	1.5	♄	17 45	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 34.8	21 56.3	248 51.5	183 10.8	21 14.5	114 20.3	18 43.5
2	210 34.6	21 57.0	278 56.4	213 9.2	21 15.7	144 22.4	18 42.7
4	240 34.5	21 57.7	309 1.3	243 7.7	21 16.9	174 24.5	18 41.8
6	270 34.3	21 58.4	339 6.3	273 6.1	21 18.1	204 26.6	18 41.0
8	300 34.1	21 59.1	9 11.2	303 4.6	21 19.2	234 28.7	18 40.1
10	330 33.9	21 59.8	39 16.1	333 3.0	21 20.4	264 30.8	18 39.3
12	0 33.7	22 .5	69 21.0	3 1.5	21 21.6	294 32.9	18 38.4
14	30 33.5	22 1.2	99 26.0	32 59.9	21 22.8	324 34.9	18 37.6
16	60 33.3	22 1.9	129 30.9	62 58.4	21 23.9	354 37.0	18 36.7
18	90 33.1	22 2.6	159 35.8	92 56.8	21 25.1	24 39.1	18 35.9
20	120 33.0	22 3.3	189 40.8	122 55.3	21 26.3	54 41.2	18 35.0
22	150 32.8	22 3.9	219 45.7	152 53.7	21 27.4	84 43.3	18 34.2
Δ	-1	3		-8	6	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	235 17.2	106	10 17.6	155	315 27.0	-21 47.6	93 53.6	12 15.6
2	264 16.4	104	10 48.6	154	345 32.3	-21 47.7	123 58.3	12 15.5
4	293 15.2	102	11 19.5	153	15 37.5	-21 47.8	154 3.0	12 15.4
6	322 13.5	100	11 50.1	152	45 42.8	-21 47.8	184 7.7	12 15.3
8	351 11.5	98	12 20.6	151	75 48.1	-21 47.9	214 12.5	12 15.2
10	20 9.0	95	12 50.8	150	105 53.4	-21 48.0	244 17.2	12 15.1
12	49 6.1	93	13 20.9	149	135 58.7	-21 48.0	274 21.9	12 15.0
14	78 2.8	91	13 50.7	148	166 3.9	-21 48.1	304 26.6	12 14.9
16	106 59.0	89	14 20.3	147	196 9.2	-21 48.2	334 31.3	12 14.8
18	135 54.7	86	14 49.6	145	226 14.5	-21 48.2	4 36.0	12 14.7
20	164 50.0	84	15 18.6	144	256 19.8	-21 48.3	34 40.7	12 14.6
22	193 44.7	82	15 47.3	142	286 25.1	-21 48.3	64 45.4	12 14.5
Δ					26	0	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 50	21 6	1 24	: ::	1 8	.1	16 38	4.6
55	3 29	20 27	0 54	: ::	1 21	.5	16 17	4.1
50	3 56	19 60	0 43	: ::	1 31	.8	16 2	3.7
45	4 17	19 39	0 36	2 24	1 40	1.1	15 50	3.5
40	4 34	19 22	0 32	1 59	1 47	1.3	15 40	3.3
35	4 47	19 8	0 29	1 44	1 53	1.4	15 31	3.1
30	4 60	18 56	0 27	1 35	1 58	1.6	15 24	3.0
20	5 20	18 36	0 24	1 23	2 8	1.8	15 11	2.7
10	5 38	18 18	0 23	1 17	2 16	2.0	14 59	2.5
0	5 54	18 1	0 22	1 14	2 24	2.2	14 49	2.3
10	6 10	17 45	0 23	1 15	2 32	2.4	14 38	2.1
20	6 28	17 28	0 24	1 18	2 41	2.6	14 27	1.9
30	6 47	17 8	0 26	1 25	2 51	2.9	14 15	1.7
35	6 59	16 56	0 28	1 30	2 57	3.0	14 7	1.5
40	7 12	16 43	0 30	1 36	3 4	3.2	13 59	1.4
45	7 27	16 28	0 33	1 45	3 12	3.4	13 50	1.2
50	7 46	16 9	0 38	1 57	3 21	3.7	13 38	.9
55	8 11	15 44	0 44	2 14	3 33	4.0	13 24	.6
60	8 45	15 10	0 55	2 40	3 49	4.5	13 5	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 19.5	-.4	15.8	$T_{\overline{m}}$	8 36	2.3	59.6	16.2
12	2 15.0	$T_{\overline{m}_\odot}$	11 h 57.8 min	Starost 25.5 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 48	.1	294	-3.8	♃	2 58	.0	67	-2.4
♂	16 22	.1	225	1.5	♄	17 42	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 32.6	22 4.6	249 50.6	182 52.1	21 28.6	114 45.4	18 33.3
2	210 32.4	22 5.3	279 55.5	212 50.6	21 29.7	144 47.5	18 32.5
4	240 32.2	22 5.9	310 .5	242 49.0	21 30.9	174 49.6	18 31.6
6	270 32.0	22 6.6	340 5.4	272 47.4	21 32.0	204 51.7	18 30.8
8	300 31.8	22 7.3	10 10.3	302 45.9	21 33.1	234 53.8	18 29.9
10	330 31.6	22 7.9	40 15.3	332 44.3	21 34.3	264 55.9	18 29.1
12	0 31.4	22 8.6	70 20.2	2 42.7	21 35.4	294 57.9	18 28.2
14	30 31.2	22 9.3	100 25.1	32 41.2	21 36.5	325 .0	18 27.4
16	60 31.0	22 9.9	130 30.0	62 39.6	21 37.6	355 2.1	18 26.5
18	90 30.8	22 10.6	160 35.0	92 38.0	21 38.7	25 4.2	18 25.6
20	120 30.6	22 11.2	190 39.9	122 36.4	21 39.8	55 6.3	18 24.8
22	150 30.4	22 11.9	220 44.8	152 34.9	21 40.9	85 8.4	18 23.9
Δ	-1	3		-8	6	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 39.1	79	16 15.7	140	316 30.4	-21 48.4	94 50.1	12 14.4
2	251 32.9	77	16 43.8	139	346 35.7	-21 48.5	124 54.8	12 14.3
4	280 26.2	74	17 11.5	137	16 40.9	-21 48.5	154 59.5	12 14.2
6	309 19.0	72	17 38.9	135	46 46.2	-21 48.6	185 4.1	12 14.1
8	338 11.3	69	18 5.8	133	76 51.5	-21 48.7	215 8.8	12 14.0
10	7 3.1	66	18 32.4	131	106 56.8	-21 48.7	245 13.5	12 13.9
12	35 54.4	64	18 58.5	128	137 2.1	-21 48.8	275 18.2	12 13.8
14	64 45.1	61	19 24.2	126	167 7.4	-21 48.9	305 22.9	12 13.7
16	93 35.4	59	19 49.4	124	197 12.7	-21 48.9	335 27.6	12 13.6
18	122 25.1	56	20 14.2	121	227 18.0	-21 49.0	5 32.3	12 13.5
20	151 14.3	53	20 38.4	119	257 23.3	-21 49.1	35 37.0	12 13.4
22	180 3.0	51	21 2.1	116	287 28.6	-21 49.1	65 41.7	12 13.3
Δ					26	0	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 49	21 8	1 25	: ::	1 11	.3	18 29	4.8
55	3 28	20 28	0 55	: ::	1 34	.8	17 55	4.2
50	3 56	20 1	0 43	: ::	1 51	1.1	17 32	3.8
45	4 16	19 40	0 36	2 25	2 5	1.3	17 13	3.5
40	4 33	19 23	0 32	1 59	2 17	1.5	16 58	3.4
35	4 47	19 9	0 29	1 45	2 27	1.7	16 45	3.2
30	4 59	18 57	0 27	1 35	2 36	1.8	16 34	3.1
20	5 20	18 36	0 24	1 23	2 51	2.1	16 16	2.9
10	5 38	18 18	0 23	1 17	3 5	2.2	15 59	2.7
0	5 54	18 2	0 22	1 14	3 17	2.4	15 44	2.5
10	6 11	17 45	0 23	1 15	3 30	2.6	15 29	2.4
20	6 28	17 28	0 24	1 18	3 44	2.8	15 13	2.2
30	6 48	17 8	0 26	1 25	4 0	3.0	14 55	2.0
35	6 59	16 56	0 28	1 30	4 10	3.2	14 44	1.9
40	7 13	16 43	0 30	1 36	4 21	3.3	14 32	1.7
45	7 28	16 27	0 33	1 45	4 33	3.5	14 18	1.5
50	7 47	16 8	0 38	1 57	4 49	3.8	14 0	1.3
55	8 12	15 43	0 44	2 15	5 9	4.2	13 38	.9
60	8 47	15 8	0 55	2 41	5 37	4.8	13 9	.3
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 10.5	-.4	15.8	$T_{\overline{m}}$	9 31	2.5	60.4	16.4
12	2 5.7	$T_{\overline{m}_\odot}$ 11 h 57.9 min		Starost 26.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 49	.1	293	-3.8	♆	2 53	.0	67	-2.4
♂	16 20	.1	225	1.5	♄	17 38	.0	205	.6

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 30.2	22 12.5	250 49.8	182 33.3	21 42.0	115 10.5	18 23.1
2	210 30.0	22 13.1	280 54.7	212 31.7	21 43.1	145 12.6	18 22.2
4	240 29.8	22 13.8	310 59.6	242 30.1	21 44.2	175 14.7	18 21.3
6	270 29.6	22 14.4	341 4.5	272 28.5	21 45.3	205 16.7	18 20.5
8	300 29.4	22 15.0	11 9.5	302 26.9	21 46.4	235 18.8	18 19.6
10	330 29.2	22 15.7	41 14.4	332 25.3	21 47.5	265 20.9	18 18.8
12	0 29.0	22 16.3	71 19.3	2 23.8	21 48.6	295 23.0	18 17.9
14	30 28.8	22 16.9	101 24.3	32 22.2	21 49.6	325 25.1	18 17.0
16	60 28.6	22 17.5	131 29.2	62 20.6	21 50.7	355 27.2	18 16.2
18	90 28.4	22 18.2	161 34.1	92 19.0	21 51.8	25 29.3	18 15.3
20	120 28.2	22 18.8	191 39.0	122 17.4	21 52.8	55 31.4	18 14.4
22	150 27.9	22 19.4	221 44.0	152 15.8	21 53.9	85 33.5	18 13.6
Δ	-1	3		-8	5	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	208 51.2	48	21 25.3	113	317 33.9	-21 49.2	95 46.4	12 13.2
2	237 38.8	46	21 48.0	110	347 39.2	-21 49.3	125 51.1	12 13.1
4	266 26.0	43	22 10.0	107	17 44.5	-21 49.4	155 55.8	12 13.0
6	295 12.6	41	22 31.5	104	47 49.8	-21 49.4	186 .5	12 12.9
8	323 58.8	38	22 52.4	101	77 55.1	-21 49.5	216 5.1	12 12.8
10	352 44.4	36	23 12.6	98	108 .5	-21 49.6	246 9.8	12 12.7
12	21 29.6	33	23 32.2	95	138 5.8	-21 49.6	276 14.5	12 12.6
14	50 14.3	31	23 51.1	91	168 11.1	-21 49.7	306 19.2	12 12.5
16	78 58.5	29	24 9.4	88	198 16.4	-21 49.8	336 23.9	12 12.4
18	107 42.3	27	24 26.9	84	228 21.7	-21 49.8	6 28.6	12 12.3
20	136 25.6	25	24 43.8	81	258 27.0	-21 49.9	36 33.3	12 12.2
22	165 8.6	23	24 59.9	77	288 32.3	-21 50.0	66 38.0	12 12.1
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 10	1 27	: ::	1 17	.6	20 25	4.4
55	3 27	20 30	0 55	: ::	1 52	1.2	19 35	3.8
50	3 55	20 2	0 43	: ::	2 17	1.5	19 3	3.5
45	4 16	19 41	0 37	2 26	2 37	1.8	18 38	3.4
40	4 33	19 24	0 32	1 60	2 54	1.9	18 19	3.2
35	4 47	19 10	0 29	1 45	3 7	2.1	18 3	3.2
30	4 59	18 57	0 27	1 35	3 19	2.2	17 49	3.1
20	5 20	18 36	0 24	1 23	3 40	2.4	17 25	2.9
10	5 38	18 18	0 23	1 17	3 58	2.5	17 4	2.8
0	5 54	18 2	0 22	1 14	4 16	2.6	16 45	2.7
10	6 11	17 45	0 23	1 15	4 33	2.8	16 26	2.6
20	6 28	17 28	0 24	1 18	4 52	2.9	16 6	2.5
30	6 48	17 8	0 26	1 25	5 13	3.1	15 43	2.4
35	7 0	16 56	0 28	1 30	5 26	3.2	15 29	2.3
40	7 13	16 43	0 30	1 37	5 41	3.3	15 13	2.2
45	7 29	16 27	0 33	1 46	5 58	3.5	14 54	2.0
50	7 48	16 7	0 38	1 58	6 20	3.7	14 31	1.8
55	8 13	15 42	0 44	2 15	6 49	4.1	14 1	1.5
60	8 49	15 7	0 55	2 41	7 32	4.8	13 16	.8
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	2 1.0	-.4	15.8	$T_{\overline{m}}$	10 30	2.7	61.0	16.6
12	1 56.1	$T_{\overline{m}_\odot}$ 11 h 58.1 min		Starost 27.5 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 50	.1	292	-3.8	♆	2 49	.0	67	-2.4
♂	16 18	.1	224	1.5	♄	17 34	.0	205	.6

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 27.7	22 20.0	251 48.9	182 14.2	21 54.9	115 35.6	18 12.7
2	210 27.5	22 20.6	281 53.8	212 12.6	21 56.0	145 37.6	18 11.8
4	240 27.3	22 21.2	311 58.8	242 11.0	21 57.0	175 39.7	18 11.0
6	270 27.1	22 21.8	342 3.7	272 9.4	21 58.0	205 41.8	18 10.1
8	300 26.9	22 22.4	12 8.6	302 7.8	21 59.1	235 43.9	18 9.2
10	330 26.7	22 23.0	42 13.5	332 6.1	22 .1	265 46.0	18 8.3
12	0 26.5	22 23.6	72 18.5	2 4.5	22 1.1	295 48.1	18 7.5
14	30 26.3	22 24.2	102 23.4	32 2.9	22 2.2	325 50.2	18 6.6
16	60 26.0	22 24.8	132 28.3	62 1.3	22 3.2	355 52.3	18 5.7
18	90 25.8	22 25.4	162 33.2	91 59.7	22 4.2	25 54.4	18 4.8
20	120 25.6	22 26.0	192 38.2	121 58.1	22 5.2	55 56.4	18 4.0
22	150 25.4	22 26.5	222 43.1	151 56.5	22 6.2	85 58.5	18 3.1
Δ	-1	3		-8	5	10	-4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	193 51.1	21	25 15.2	73	318 37.7	-21 50.0	96 42.6	12 12.0
2	222 33.3	19	25 29.8	69	348 43.0	-21 50.1	126 47.3	12 11.9
4	251 15.0	17	25 43.6	65	18 48.3	-21 50.2	156 52.0	12 11.8
6	279 56.5	16	25 56.7	61	48 53.6	-21 50.3	186 56.7	12 11.7
8	308 37.6	14	26 8.9	57	78 58.9	-21 50.3	217 1.4	12 11.6
10	337 18.4	13	26 20.4	53	109 4.3	-21 50.4	247 6.0	12 11.5
12	5 58.9	11	26 31.0	49	139 9.6	-21 50.5	277 10.7	12 11.4
14	34 39.2	10	26 40.8	45	169 14.9	-21 50.5	307 15.4	12 11.3
16	63 19.2	9	26 49.7	40	199 20.2	-21 50.6	337 20.1	12 11.2
18	91 59.1	8	26 57.8	36	229 25.6	-21 50.7	7 24.8	12 11.1
20	120 38.7	8	27 5.0	32	259 30.9	-21 50.8	37 29.4	12 11.0
22	149 18.2	7	27 11.4	28	289 36.2	-21 50.8	67 34.1	12 10.9
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 46	21 12	1 28	: ::	1 30	1.4	22 11	2.9
55	3 26	20 31	0 55	: ::	2 21	2.0	21 7	2.9
50	3 54	20 3	0 43	: ::	2 54	2.2	20 27	2.9
45	4 15	19 41	0 37	2 26	3 20	2.3	19 59	2.9
40	4 32	19 24	0 32	2 0	3 40	2.4	19 37	2.9
35	4 47	19 10	0 29	1 45	3 57	2.5	19 18	2.9
30	4 59	18 58	0 27	1 35	4 12	2.6	19 2	2.9
20	5 20	18 37	0 24	1 23	4 37	2.7	18 36	2.8
10	5 38	18 19	0 23	1 17	4 59	2.7	18 12	2.8
0	5 55	18 2	0 22	1 15	5 19	2.8	17 51	2.8
10	6 11	17 45	0 23	1 15	5 40	2.9	17 29	2.8
20	6 29	17 28	0 24	1 18	6 2	2.9	17 6	2.8
30	6 49	17 7	0 26	1 25	6 28	3.0	16 39	2.7
35	7 1	16 56	0 28	1 30	6 43	3.0	16 24	2.7
40	7 14	16 42	0 30	1 37	7 1	3.1	16 5	2.7
45	7 30	16 26	0 33	1 46	7 22	3.2	15 43	2.6
50	7 49	16 7	0 38	1 58	7 50	3.3	15 15	2.6
55	8 15	15 42	0 44	2 15	8 27	3.4	14 37	2.5
60	8 50	15 6	0 55	2 42	9 28	3.8	13 36	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	1 51.1	-.4	15.8	$T_{\overline{m}}$ 11 35	2.8	61.3	16.7
12	1 46.0	$T_{\overline{m}_\odot}$ 11 h 58.2 min		Starost 28.5 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 52	.1	290	-3.8	♃	2 45	.0	67	-2.4
♂	16 16	.1	224	1.5	♄	17 30	.0	205	.6

4. JUN SREDA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 25.2	22 27.1	252 48.0	181 54.8	22 7.2	116 .6	18 2.2
2	210 25.0	22 27.7	282 53.0	211 53.2	22 8.2	146 2.7	18 1.3
4	240 24.7	22 28.3	312 57.9	241 51.6	22 9.2	176 4.8	18 .4
6	270 24.5	22 28.8	343 2.8	271 50.0	22 10.2	206 6.9	17 59.6
8	300 24.3	22 29.4	13 7.7	301 48.3	22 11.1	236 9.0	17 58.7
10	330 24.1	22 30.0	43 12.7	331 46.7	22 12.1	266 11.1	17 57.8
12	0 23.9	22 30.5	73 17.6	1 45.1	22 13.1	296 13.1	17 56.9
14	30 23.6	22 31.1	103 22.5	31 43.5	22 14.0	326 15.2	17 56.0
16	60 23.4	22 31.6	133 27.5	61 41.8	22 15.0	356 17.3	17 55.2
18	90 23.2	22 32.2	163 32.4	91 40.2	22 16.0	26 19.4	17 54.3
20	120 23.0	22 32.8	193 37.3	121 38.6	22 16.9	56 21.5	17 53.4
22	150 22.8	22 33.3	223 42.2	151 36.9	22 17.9	86 23.6	17 52.5
Δ	-1	3		-8	5	10	-4

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	177 57.6	6	27 16.9	23	319 41.6	-21 50.9	97 38.8	12 10.7
2	206 36.9	6	27 21.5	19	349 46.9	-21 51.0	127 43.5	12 10.6
4	235 16.1	6	27 25.3	14	19 52.2	-21 51.0	157 48.1	12 10.5
6	263 55.3	6	27 28.2	10	49 57.6	-21 51.1	187 52.8	12 10.4
8	292 34.5	6	27 30.2	6	80 2.9	-21 51.2	217 57.5	12 10.3
10	321 13.7	6	27 31.3	1	110 8.2	-21 51.3	248 2.2	12 10.2
12	349 52.9	7	27 31.5	-3	140 13.6	-21 51.3	278 6.8	12 10.1
14	18 32.3	7	27 30.9	-7	170 18.9	-21 51.4	308 11.5	12 10.0
16	47 11.7	8	27 29.4	-12	200 24.3	-21 51.5	338 16.2	12 9.9
18	75 51.3	9	27 27.0	-16	230 29.6	-21 51.5	8 20.9	12 9.8
20	104 31.1	10	27 23.8	-20	260 34.9	-21 51.6	38 25.5	12 9.7
22	133 11.0	11	27 19.7	-25	290 40.3	-21 51.7	68 30.2	12 9.6
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 45	21 13	1 30	: ::	2 3	3.0	23 20	1.2
55	3 26	20 32	0 56	: ::	3 8	3.0	22 16	1.8
50	3 54	20 4	0 43	: ::	3 47	2.9	21 37	2.1
45	4 15	19 42	0 37	2 27	4 16	2.9	21 8	2.2
40	4 32	19 25	0 32	2 0	4 39	2.9	20 46	2.3
35	4 46	19 11	0 29	1 45	4 57	2.9	20 27	2.4
30	4 59	18 58	0 27	1 35	5 13	2.9	20 11	2.5
20	5 20	18 37	0 24	1 23	5 41	2.8	19 44	2.6
10	5 38	18 19	0 23	1 17	6 4	2.8	19 20	2.7
0	5 55	18 2	0 22	1 15	6 26	2.8	18 58	2.7
10	6 11	17 45	0 23	1 15	6 48	2.8	18 36	2.8
20	6 29	17 28	0 24	1 18	7 12	2.7	18 13	2.9
30	6 49	17 7	0 26	1 25	7 40	2.7	17 45	3.0
35	7 1	16 55	0 28	1 30	7 56	2.7	17 29	3.0
40	7 15	16 42	0 30	1 37	8 15	2.6	17 10	3.1
45	7 31	16 26	0 33	1 46	8 38	2.6	16 47	3.1
50	7 50	16 6	0 38	1 58	9 8	2.5	16 17	3.3
55	8 16	15 41	0 44	2 15	9 49	2.3	15 36	3.4
60	8 52	15 5	0 56	2 42	10 60	1.9	14 25	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	1 40.9	-.4	15.8	$T_{\overline{m}}$ 12 42	2.8	61.3	16.7
12	1 35.6	$T_{\overline{m}_\odot}$ 11 h 58.4 min		Starost .2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 53	.1	289	-3.8	♃	2 41	.0	67	-2.4
♂	16 15	.1	223	1.5	♄	17 27	.0	205	.7

5. JUN 2008. ČETVRTAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 22.5	22 33.8	253 47.2	181 35.3	22 18.8	116 25.7	17 51.6
2	210 22.3	22 34.4	283 52.1	211 33.6	22 19.8	146 27.8	17 50.7
4	240 22.1	22 34.9	313 57.0	241 32.0	22 20.7	176 29.9	17 49.8
6	270 21.9	22 35.5	344 2.0	271 30.4	22 21.6	206 31.9	17 48.9
8	300 21.6	22 36.0	14 6.9	301 28.7	22 22.6	236 34.0	17 48.0
10	330 21.4	22 36.5	44 11.8	331 27.1	22 23.5	266 36.1	17 47.2
12	0 21.2	22 37.1	74 16.7	1 25.4	22 24.4	296 38.2	17 46.3
14	30 21.0	22 37.6	104 21.7	31 23.8	22 25.3	326 40.3	17 45.4
16	60 20.7	22 38.1	134 26.6	61 22.1	22 26.2	356 42.4	17 44.5
18	90 20.5	22 38.6	164 31.5	91 20.5	22 27.1	26 44.5	17 43.6
20	120 20.3	22 39.1	194 36.5	121 18.8	22 28.0	56 46.6	17 42.7
22	150 20.0	22 39.7	224 41.4	151 17.2	22 28.9	86 48.7	17 41.8
Δ	-1	3		-8	5	10	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	161 51.2	12	27 14.8	-29	320 45.6	-21 51.8	98 34.9	12 9.5
2	190 31.6	14	27 9.0	-33	350 51.0	-21 51.8	128 39.5	12 9.4
4	219 12.3	15	27 2.4	-37	20 56.3	-21 51.9	158 44.2	12 9.2
6	247 53.3	17	26 54.9	-41	51 1.7	-21 52.0	188 48.9	12 9.1
8	276 34.7	18	26 46.7	-45	81 7.0	-21 52.1	218 53.5	12 9.0
10	305 16.3	20	26 37.6	-49	111 12.4	-21 52.1	248 58.2	12 8.9
12	333 58.4	22	26 27.8	-53	141 17.7	-21 52.2	279 2.9	12 8.8
14	2 40.8	24	26 17.1	-57	171 23.1	-21 52.3	309 7.5	12 8.7
16	31 23.7	26	26 5.8	-61	201 28.5	-21 52.4	339 12.2	12 8.6
18	60 6.9	29	25 53.6	-64	231 33.8	-21 52.4	9 16.9	12 8.5
20	88 50.7	31	25 40.7	-68	261 39.2	-21 52.5	39 21.5	12 8.4
22	117 34.8	33	25 27.2	-71	291 44.5	-21 52.6	69 26.2	12 8.3
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 44	21 15	1 31	: ::	3 15	4.4	23 50	.5
55	3 25	20 33	0 56	: ::	4 19	3.7	23 0	1.1
50	3 53	20 4	0 44	: ::	4 58	3.5	22 27	1.4
45	4 15	19 43	0 37	2 28	5 26	3.3	22 2	1.7
40	4 32	19 26	0 32	2 1	5 48	3.2	21 42	1.8
35	4 46	19 11	0 29	1 45	6 6	3.1	21 25	2.0
30	4 59	18 59	0 27	1 35	6 22	3.0	21 11	2.1
20	5 20	18 37	0 24	1 23	6 49	2.9	20 46	2.2
10	5 38	18 19	0 23	1 17	7 12	2.7	20 24	2.4
0	5 55	18 2	0 22	1 15	7 33	2.6	20 4	2.5
10	6 12	17 45	0 23	1 15	7 55	2.5	19 44	2.7
20	6 30	17 28	0 24	1 18	8 18	2.4	19 22	2.8
30	6 50	17 7	0 26	1 25	8 44	2.3	18 56	3.0
35	7 2	16 55	0 28	1 30	8 60	2.2	18 41	3.1
40	7 15	16 42	0 30	1 37	9 18	2.1	18 23	3.2
45	7 31	16 26	0 33	1 46	9 40	1.9	18 2	3.4
50	7 51	16 6	0 38	1 58	10 7	1.7	17 35	3.6
55	8 17	15 40	0 45	2 16	10 45	1.4	16 58	3.9
60	8 53	15 4	0 56	2 43	11 45	.7	15 59	4.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 30.3	-.5	15.8	$T_{\overline{m}}$ 13 49	2.6	61.0	16.6
12	1 24.9	$T_{\overline{m}_\odot}$ 11 h 58.6 min		Starost 1.2 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 54	.1	288	-3.8	♃	2 36	.0	67	-2.5
♂	16 13	.1	223	1.5	♄	17 23	.0	205	.7

6. JUN PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 19.8	22 40.2	254 46.3	181 15.5	22 29.8	116 50.7	17 40.9
2	210 19.6	22 40.7	284 51.2	211 13.9	22 30.7	146 52.8	17 40.0
4	240 19.4	22 41.2	314 56.2	241 12.2	22 31.6	176 54.9	17 39.1
6	270 19.1	22 41.7	345 1.1	271 10.5	22 32.5	206 57.0	17 38.2
8	300 18.9	22 42.2	15 6.0	301 8.9	22 33.3	236 59.1	17 37.3
10	330 18.7	22 42.7	45 11.0	331 7.2	22 34.2	267 1.2	17 36.4
12	0 18.4	22 43.2	75 15.9	1 5.6	22 35.1	297 3.3	17 35.5
14	30 18.2	22 43.7	105 20.8	31 3.9	22 35.9	327 5.4	17 34.6
16	60 18.0	22 44.2	135 25.7	61 2.2	22 36.8	357 7.4	17 33.7
18	90 17.7	22 44.7	165 30.7	91 .6	22 37.7	27 9.5	17 32.8
20	120 17.5	22 45.1	195 35.6	120 58.9	22 38.5	57 11.6	17 31.9
22	150 17.3	22 45.6	225 40.5	150 57.2	22 39.3	87 13.7	17 31.0
Δ	-1	2		-8	4	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	146 19.5	36	25 12.9	-75	321 49.9	-21 52.7	99 30.8	12 8.1
2	175 4.6	38	24 57.9	-78	351 55.2	-21 52.7	129 35.5	12 8.0
4	203 50.3	41	24 42.2	-82	22 .6	-21 52.8	159 40.2	12 7.9
6	232 36.5	43	24 25.9	-85	52 6.0	-21 52.9	189 44.8	12 7.8
8	261 23.1	46	24 9.0	-88	82 11.3	-21 53.0	219 49.5	12 7.7
10	290 10.4	49	23 51.4	-91	112 16.7	-21 53.0	249 54.1	12 7.6
12	318 58.1	51	23 33.2	-94	142 22.1	-21 53.1	279 58.8	12 7.5
14	347 46.4	54	23 14.4	-97	172 27.4	-21 53.2	310 3.5	12 7.4
16	16 35.3	57	22 55.1	-99	202 32.8	-21 53.3	340 8.1	12 7.3
18	45 24.7	60	22 35.2	-102	232 38.2	-21 53.4	10 12.8	12 7.1
20	74 14.6	63	22 14.8	-105	262 43.5	-21 53.4	40 17.4	12 7.0
22	103 5.1	65	21 53.9	-107	292 48.9	-21 53.5	70 22.1	12 6.9
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 42	21 16	1 33	: ::	5 0	4.6	. ..	.0
55	3 24	20 34	0 56	: ::	5 49	4.0	23 27	.7
50	3 53	20 5	0 44	: ::	6 21	3.6	23 2	1.0
45	4 14	19 44	0 37	2 28	6 45	3.4	22 42	1.3
40	4 32	19 26	0 33	2 1	7 4	3.2	22 26	1.4
35	4 46	19 12	0 29	1 46	7 20	3.1	22 12	1.6
30	4 59	18 59	0 27	1 36	7 34	2.9	22 0	1.7
20	5 20	18 38	0 24	1 23	7 58	2.7	21 40	1.9
10	5 38	18 19	0 23	1 17	8 18	2.6	21 22	2.1
0	5 55	18 2	0 22	1 15	8 37	2.4	21 5	2.3
10	6 12	17 46	0 23	1 15	8 55	2.2	20 48	2.5
20	6 30	17 28	0 24	1 18	9 16	2.1	20 29	2.6
30	6 50	17 7	0 26	1 25	9 39	1.9	20 8	2.9
35	7 2	16 55	0 28	1 30	9 52	1.8	19 55	3.0
40	7 16	16 41	0 30	1 37	10 8	1.6	19 41	3.2
45	7 32	16 25	0 34	1 46	10 26	1.4	19 23	3.3
50	7 52	16 5	0 38	1 58	10 49	1.2	19 2	3.6
55	8 18	15 40	0 45	2 16	11 19	.9	18 33	3.9
60	8 54	15 3	0 56	2 43	12 2	.3	17 51	4.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 19.4	-.5	15.8	$T_{\overline{m}}$ 14 51	2.3	60.4	16.5
12	1 13.9	$T_{\overline{m}_\odot}$ 11 h 58.8 min		Starost 2.2 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 56	.1	286	-3.8	♃	2 32	.0	67	-2.5
♂	16 11	.1	222	1.5	♄	17 19	.0	205	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 17.0	22 46.1	255 45.5	180 55.6	22 40.2	117 15.8	17 30.1
2	210 16.8	22 46.6	285 50.4	210 53.9	22 41.0	147 17.9	17 29.2
4	240 16.6	22 47.0	315 55.3	240 52.2	22 41.8	177 20.0	17 28.3
6	270 16.3	22 47.5	346 .2	270 50.5	22 42.7	207 22.1	17 27.4
8	300 16.1	22 48.0	16 5.2	300 48.9	22 43.5	237 24.2	17 26.5
10	330 15.8	22 48.5	46 10.1	330 47.2	22 44.3	267 26.2	17 25.5
12	0 15.6	22 48.9	76 15.0	0 45.5	22 45.1	297 28.3	17 24.6
14	30 15.4	22 49.4	106 19.9	30 43.8	22 45.9	327 30.4	17 23.7
16	60 15.1	22 49.8	136 24.9	60 42.1	22 46.7	357 32.5	17 22.8
18	90 14.9	22 50.3	166 29.8	90 40.5	22 47.5	27 34.6	17 21.9
20	120 14.6	22 50.7	196 34.7	120 38.8	22 48.3	57 36.7	17 21.0
22	150 14.4	22 51.2	226 39.7	150 37.1	22 49.1	87 38.8	17 20.1
Δ	-1	2		-8	4	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	131 56.2	68	21 32.4	-110	322 54.3	-21 53.6	100 26.7	12 6.8
2	160 47.8	71	21 10.5	-112	352 59.7	-21 53.7	130 31.4	12 6.7
4	189 40.0	74	20 48.1	-114	23 5.0	-21 53.7	160 36.0	12 6.6
6	218 32.8	76	20 25.3	-116	53 10.4	-21 53.8	190 40.7	12 6.5
8	247 26.1	79	20 2.0	-118	83 15.8	-21 53.9	220 45.4	12 6.3
10	276 19.9	82	19 38.4	-120	113 21.2	-21 54.0	250 50.0	12 6.2
12	305 14.3	85	19 14.3	-122	143 26.6	-21 54.1	280 54.7	12 6.1
14	334 9.2	87	18 49.8	-124	173 31.9	-21 54.1	310 59.3	12 6.0
16	3 4.7	90	18 25.0	-126	203 37.3	-21 54.2	341 4.0	12 5.9
18	32 .7	93	17 59.8	-127	233 42.7	-21 54.3	11 8.6	12 5.8
20	60 57.2	95	17 34.3	-129	263 48.1	-21 54.4	41 13.3	12 5.7
22	89 54.3	98	17 8.5	-131	293 53.5	-21 54.4	71 17.9	12 5.5
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 41	21 17	1 34	: ::	6 51	4.3	0 4	.2
55	3 23	20 35	0 56	: ::	7 24	3.8	23 44	.5
50	3 52	20 6	0 44	: ::	7 48	3.5	23 27	.8
45	4 14	19 44	0 37	2 29	8 6	3.3	23 12	1.0
40	4 31	19 27	0 33	2 1	8 21	3.1	23 1	1.2
35	4 46	19 12	0 29	1 46	8 34	2.9	22 51	1.3
30	4 58	18 60	0 27	1 36	8 44	2.8	22 42	1.5
20	5 20	18 38	0 24	1 24	9 3	2.5	22 26	1.7
10	5 38	18 20	0 23	1 17	9 19	2.3	22 13	1.9
0	5 55	18 3	0 22	1 15	9 34	2.2	21 60	2.1
10	6 12	17 46	0 23	1 15	9 49	2.0	21 47	2.3
20	6 30	17 28	0 24	1 18	10 5	1.8	21 33	2.5
30	6 51	17 7	0 26	1 25	10 24	1.6	21 17	2.7
35	7 3	16 55	0 28	1 30	10 34	1.4	21 7	2.8
40	7 17	16 41	0 30	1 37	10 46	1.3	20 56	3.0
45	7 33	16 25	0 34	1 46	11 1	1.1	20 43	3.2
50	7 53	16 5	0 38	1 59	11 18	.9	20 28	3.4
55	8 19	15 39	0 45	2 16	11 40	.6	20 7	3.7
60	8 56	15 2	0 56	2 43	12 9	.1	19 40	4.2
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	1 8.3	-.5	15.8	$T_{\overline{m}}$ 15 47	2.1	59.6	16.2
12	1 2.5	$T_{\overline{m}_\odot}$ 11 h 59.0 min		Starost 3.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 57	.1	285	-3.8	♄	2 28	.0	67	-2.5
♂	16 10	.1	221	1.5	♄	17 16	.0	205	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 14.2	22 51.6	256 44.6	180 35.4	22 49.9	117 40.9	17 19.2
2	210 13.9	22 52.1	286 49.5	210 33.7	22 50.7	147 42.9	17 18.3
4	240 13.7	22 52.5	316 54.4	240 32.0	22 51.5	177 45.0	17 17.3
6	270 13.4	22 52.9	346 59.4	270 30.3	22 52.2	207 47.1	17 16.4
8	300 13.2	22 53.4	17 4.3	300 28.7	22 53.0	237 49.2	17 15.5
10	330 13.0	22 53.8	47 9.2	330 27.0	22 53.8	267 51.3	17 14.6
12	0 12.7	22 54.2	77 14.2	0 25.3	22 54.5	297 53.4	17 13.7
14	30 12.5	22 54.7	107 19.1	30 23.6	22 55.3	327 55.5	17 12.7
16	60 12.2	22 55.1	137 24.0	60 21.9	22 56.0	357 57.6	17 11.8
18	90 12.0	22 55.5	167 28.9	90 20.2	22 56.8	27 59.6	17 10.9
20	120 11.7	22 55.9	197 33.9	120 18.5	22 57.5	58 1.7	17 10.0
22	150 11.5	22 56.3	227 38.8	150 16.8	22 58.2	88 3.8	17 9.1
Δ	-1	2		-8	4	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	118 51.8	100	16 42.4	-132	323 58.9	-21 54.5	101 22.6	12 5.4
2	147 49.8	103	16 16.0	-133	354 4.3	-21 54.6	131 27.2	12 5.3
4	176 48.4	105	15 49.3	-135	24 9.6	-21 54.7	161 31.8	12 5.2
6	205 47.4	107	15 22.4	-136	54 15.0	-21 54.8	191 36.5	12 5.1
8	234 46.9	110	14 55.2	-137	84 20.4	-21 54.8	221 41.1	12 5.0
10	263 46.8	112	14 27.8	-138	114 25.8	-21 54.9	251 45.8	12 4.8
12	292 47.2	114	14 .1	-139	144 31.2	-21 55.0	281 50.4	12 4.7
14	321 48.0	116	13 32.3	-140	174 36.6	-21 55.1	311 55.1	12 4.6
16	350 49.3	118	13 4.3	-141	204 42.0	-21 55.2	341 59.7	12 4.5
18	19 51.0	121	12 36.1	-142	234 47.4	-21 55.2	12 4.4	12 4.4
20	48 53.1	123	12 7.7	-143	264 52.8	-21 55.3	42 9.0	12 4.2
22	77 55.6	124	11 39.2	-143	294 58.2	-21 55.4	72 13.6	12 4.1
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 19	1 36	: ::	8 35	4.0	0 9	.1
55	3 23	20 36	0 57	: ::	8 56	3.6	23 56	.4
50	3 52	20 7	0 44	: ::	9 12	3.3	23 45	.6
45	4 14	19 45	0 37	2 30	9 24	3.1	23 36	.8
40	4 31	19 27	0 33	2 2	9 35	2.9	23 29	1.0
35	4 46	19 13	0 30	1 46	9 43	2.7	23 22	1.2
30	4 58	19 0	0 27	1 36	9 51	2.6	23 17	1.3
20	5 20	18 39	0 24	1 24	10 4	2.4	23 7	1.5
10	5 38	18 20	0 23	1 17	10 16	2.2	22 58	1.7
0	5 55	18 3	0 22	1 15	10 26	2.0	22 49	1.9
10	6 12	17 46	0 23	1 15	10 37	1.8	22 41	2.1
20	6 31	17 28	0 24	1 18	10 48	1.6	22 32	2.3
30	6 51	17 7	0 26	1 25	11 1	1.4	22 21	2.5
35	7 3	16 55	0 28	1 30	11 9	1.2	22 15	2.7
40	7 17	16 41	0 30	1 37	11 17	1.1	22 8	2.8
45	7 33	16 25	0 34	1 46	11 27	.9	21 60	3.0
50	7 53	16 5	0 38	1 59	11 39	.7	21 50	3.2
55	8 20	15 38	0 45	2 16	11 53	.4	21 37	3.5
60	8 57	15 1	0 56	2 44	12 13	.1	21 20	3.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 56.8	-.5	15.8	$T_{\overline{m}}$ 16 38	1.9	58.7	16.0
12	0 51.0	$T_{\overline{m}_\odot}$ 11 h 59.2 min		Starost 4.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	11 58	.1	284	-3.8	♄	2 24	.0	67	-2.5
♂	16 8	.1	221	1.5	♄	17 12	.0	205	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 11.2	22 56.8	257 43.7	180 15.1	22 59.0	118 5.9	17 8.1
2	210 11.0	22 57.2	287 48.7	210 13.4	22 59.7	148 8.0	17 7.2
4	240 10.8	22 57.6	317 53.6	240 11.7	23 .5	178 10.1	17 6.3
6	270 10.5	22 58.0	347 58.5	270 9.9	23 1.2	208 12.2	17 5.4
8	300 10.3	22 58.4	18 3.4	300 8.2	23 1.9	238 14.3	17 4.4
10	330 10.0	22 58.8	48 8.4	330 6.5	23 2.6	268 16.4	17 3.5
12	0 9.8	22 59.2	78 13.3	0 4.8	23 3.3	298 18.4	17 2.6
14	30 9.5	22 59.6	108 18.2	30 3.1	23 3.9	328 20.5	17 1.7
16	60 9.3	22 59.9	138 23.2	60 1.4	23 4.6	358 22.6	17 .7
18	90 9.0	23 .3	168 28.1	89 59.7	23 5.3	28 24.7	16 59.8
20	120 8.8	23 .7	198 33.0	119 58.0	23 6.0	58 26.8	16 58.9
22	150 8.5	23 1.1	228 37.9	149 56.3	23 6.7	88 28.9	16 57.9
Δ	-1	2		-9	3	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	106 58.5	126	11 10.5	-144	325 3.6	-21 55.5	102 18.3	12 4.0
2	136 1.8	128	10 41.7	-145	355 9.0	-21 55.6	132 22.9	12 3.9
4	165 5.4	130	10 12.8	-145	25 14.4	-21 55.6	162 27.6	12 3.8
6	194 9.4	132	9 43.7	-146	55 19.8	-21 55.7	192 32.2	12 3.6
8	223 13.8	133	9 14.6	-146	85 25.2	-21 55.8	222 36.8	12 3.5
10	252 18.4	135	8 45.4	-146	115 30.6	-21 55.9	252 41.5	12 3.4
12	281 23.4	137	8 16.1	-147	145 36.0	-21 56.0	282 46.1	12 3.3
14	310 28.7	138	7 46.7	-147	175 41.4	-21 56.1	312 50.7	12 3.2
16	339 34.4	139	7 17.3	-147	205 46.8	-21 56.1	342 55.4	12 3.0
18	8 40.3	141	6 47.9	-148	235 52.2	-21 56.2	13 .0	12 2.9
20	37 46.4	142	6 18.3	-148	265 57.7	-21 56.3	43 4.7	12 2.8
22	66 52.9	143	5 48.8	-148	296 3.1	-21 56.4	73 9.3	12 2.7
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 20	1 37	: ::	10 11	3.7	0 12	.0
55	3 22	20 37	0 57	: ::	10 22	3.4	.. ..	.0
50	3 51	20 8	0 44	: ::	10 31	3.1	.. ..	.0
45	4 13	19 46	0 37	2 30	10 38	2.9	23 56	.8
40	4 31	19 28	0 33	2 2	10 44	2.7	23 53	.9
35	4 46	19 13	0 30	1 46	10 49	2.6	23 50	1.1
30	4 58	19 0	0 27	1 36	10 53	2.4	23 47	1.2
20	5 20	18 39	0 24	1 24	11 1	2.2	23 43	1.4
10	5 38	18 20	0 23	1 17	11 7	2.0	23 39	1.6
0	5 56	18 3	0 22	1 15	11 14	1.8	23 35	1.8
10	6 13	17 46	0 23	1 15	11 20	1.6	23 31	2.0
20	6 31	17 28	0 24	1 18	11 26	1.4	23 26	2.2
30	6 52	17 7	0 26	1 25	11 34	1.2	23 22	2.4
35	7 4	16 55	0 28	1 30	11 38	1.1	23 19	2.5
40	7 18	16 41	0 30	1 37	11 43	1.0	23 15	2.7
45	7 34	16 25	0 34	1 46	11 48	.8	23 11	2.9
50	7 54	16 4	0 38	1 59	11 55	.6	23 7	3.1
55	8 21	15 38	0 45	2 17	12 3	.3	23 1	3.3
60	8 58	15 1	0 57	2 44	12 14	.0	22 53	3.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 45.2	-.5	15.8	$T_{\overline{m}}$	17 24	1.8	57.7	15.7
12	0 39.2	$T_{\overline{m}_\odot}$ 11 h 59.3 min		Starost 5.2 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	11 60	.1	283	-3.8	♃	2 19	.0	67	-2.5
♂	16 6	.1	220	1.5	♄	17 8	.0	205	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 8.3	23 1.5	258 42.9	179 54.6	23 7.4	118 31.0	16 57.0
2	210 8.0	23 1.8	288 47.8	209 52.8	23 8.0	148 33.1	16 56.1
4	240 7.8	23 2.2	318 52.7	239 51.1	23 8.7	178 35.2	16 55.1
6	270 7.5	23 2.6	348 57.7	269 49.4	23 9.3	208 37.2	16 54.2
8	300 7.3	23 3.0	19 2.6	299 47.7	23 10.0	238 39.3	16 53.3
10	330 7.0	23 3.3	49 7.5	329 46.0	23 10.6	268 41.4	16 52.3
12	0 6.8	23 3.7	79 12.4	359 44.2	23 11.3	298 43.5	16 51.4
14	30 6.5	23 4.0	109 17.4	29 42.5	23 11.9	328 45.6	16 50.5
16	60 6.3	23 4.4	139 22.3	59 40.8	23 12.6	358 47.7	16 49.5
18	90 6.0	23 4.7	169 27.2	89 39.1	23 13.2	28 49.8	16 48.6
20	120 5.8	23 5.1	199 32.2	119 37.4	23 13.8	58 51.9	16 47.7
22	150 5.5	23 5.4	229 37.1	149 35.6	23 14.5	88 54.0	16 46.7
Δ	-1	2		-9	3	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	95 59.6	145	5 19.2	-148	326 8.5	-21 56.5	103 13.9	12 2.6
2	125 6.5	146	4 49.6	-148	356 13.9	-21 56.5	133 18.6	12 2.4
4	154 13.7	147	4 20.1	-148	26 19.3	-21 56.6	163 23.2	12 2.3
6	183 21.0	148	3 50.5	-148	56 24.7	-21 56.7	193 27.8	12 2.2
8	212 28.6	149	3 20.9	-148	86 30.1	-21 56.8	223 32.5	12 2.1
10	241 36.4	150	2 51.3	-148	116 35.6	-21 56.9	253 37.1	12 2.0
12	270 44.4	151	2 21.8	-148	146 41.0	-21 57.0	283 41.7	12 1.8
14	299 52.6	152	1 52.3	-147	176 46.4	-21 57.0	313 46.3	12 1.7
16	329 .9	152	1 22.8	-147	206 51.8	-21 57.1	343 51.0	12 1.6
18	358 9.4	153	0 53.4	-147	236 57.2	-21 57.2	13 55.6	12 1.5
20	27 18.0	154	0 24.1	-147	267 2.7	-21 57.3	44 .2	12 1.3
22	56 26.8	154	- 0 5.2	-146	297 8.1	-21 57.4	74 4.9	12 1.2
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 21	1 39	: ::	11 41	3.6	0 13	.0
55	3 22	20 38	0 57	: ::	11 44	3.3	0 6	.3
50	3 51	20 8	0 44	: ::	11 46	3.0	0 1	.6
45	4 13	19 46	0 37	2 31	11 48	2.8	.. ..	.0
40	4 31	19 29	0 33	2 2	11 49	2.6	.. ..	.0
35	4 46	19 14	0 30	1 46	11 51	2.5	.. ..	.0
30	4 58	19 1	0 27	1 36	11 52	2.4	.. ..	.0
20	5 20	18 39	0 24	1 24	11 54	2.1	.. ..	.0
10	5 39	18 21	0 23	1 17	11 56	1.9	.. ..	.0
0	5 56	18 3	0 22	1 15	11 57	1.8	.. ..	.0
10	6 13	17 46	0 23	1 15	11 59	1.6	.. ..	.0
20	6 31	17 28	0 24	1 18	12 1	1.4	.. ..	.0
30	6 52	17 7	0 26	1 25	12 3	1.2	.. ..	.0
35	7 4	16 55	0 28	1 30	12 4	1.0	.. ..	.0
40	7 18	16 41	0 30	1 37	12 6	.9	.. ..	.0
45	7 35	16 24	0 34	1 46	12 7	.7	.. ..	.0
50	7 55	16 4	0 38	1 59	12 9	.5	.. ..	.0
55	8 21	15 38	0 45	2 17	12 11	.3	.. ..	.0
60	8 59	14 60	0 57	2 45	12 14	.0	.. ..	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	0 33.3	-.5	15.8	$T_{\overline{m}}$	18 8	1.7	56.8	15.5
12	0 27.2	$T_{\overline{m}_\odot}$ 11 h 59.5 min		Starost 6.2 d		Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 1	.1	281	-3.8	♃	2 15	.0	67	-2.5
♂	16 5	.1	220	1.5	♄	17 4	.0	205	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 5.2	23 5.8	259 42.0	179 33.9	23 15.1	118 56.0	16 45.8
2	210 5.0	23 6.1	289 46.9	209 32.2	23 15.7	148 58.1	16 44.8
4	240 4.7	23 6.5	319 51.9	239 30.4	23 16.3	179 .2	16 43.9
6	270 4.5	23 6.8	349 56.8	269 28.7	23 16.9	209 2.3	16 43.0
8	300 4.2	23 7.1	20 1.7	299 27.0	23 17.5	239 4.4	16 42.0
10	330 4.0	23 7.5	50 6.6	329 25.3	23 18.1	269 6.5	16 41.1
12	0 3.7	23 7.8	80 11.6	359 23.5	23 18.7	299 8.6	16 40.1
14	30 3.5	23 8.1	110 16.5	29 21.8	23 19.3	329 10.7	16 39.2
16	60 3.2	23 8.4	140 21.4	59 20.0	23 19.8	359 12.8	16 38.2
18	90 2.9	23 8.8	170 26.4	89 18.3	23 20.4	29 14.8	16 37.3
20	120 2.7	23 9.1	200 31.3	119 16.6	23 21.0	59 16.9	16 36.3
22	150 2.4	23 9.4	230 36.2	149 14.8	23 21.6	89 19.0	16 35.4
Δ	-1	2		-9	3	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	85 35.7	155	- 0 34.5	-146	327 13.5	-21 57.5	104 9.5	12 1.1
2	114 44.7	156	- 1 3.6	-145	357 18.9	-21 57.5	134 14.1	12 1.0
4	143 53.8	156	- 1 32.7	-145	27 24.4	-21 57.6	164 18.7	12 .8
6	173 3.0	156	- 2 1.7	-145	57 29.8	-21 57.7	194 23.4	12 .7
8	202 12.3	157	- 2 30.6	-144	87 35.2	-21 57.8	224 28.0	12 .6
10	231 21.6	157	- 2 59.4	-143	117 40.6	-21 57.9	254 32.6	12 .5
12	260 31.1	157	- 3 28.1	-143	147 46.1	-21 58.0	284 37.2	12 .3
14	289 40.5	158	- 3 56.7	-142	177 51.5	-21 58.0	314 41.9	12 .2
16	318 50.0	158	- 4 25.2	-142	207 56.9	-21 58.1	344 46.5	12 .1
18	347 59.6	158	- 4 53.5	-141	238 2.4	-21 58.2	14 51.1	11 60.0
20	17 9.2	158	- 5 21.7	-140	268 7.8	-21 58.3	44 55.7	11 59.8
22	46 18.8	158	- 5 49.8	-140	298 13.2	-21 58.4	75 .3	11 59.7
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 22	1 40	: ::	13 7	3.5	0 13	.0
55	3 21	20 38	0 57	: ::	13 2	3.2	0 14	.3
50	3 51	20 9	0 44	: ::	12 58	2.9	0 15	.5
45	4 13	19 47	0 37	2 31	12 55	2.7	0 15	.7
40	4 31	19 29	0 33	2 2	12 52	2.6	0 15	.9
35	4 45	19 14	0 30	1 47	12 50	2.4	0 16	1.0
30	4 58	19 1	0 27	1 36	12 48	2.3	0 16	1.2
20	5 20	18 40	0 25	1 24	12 45	2.1	0 17	1.4
10	5 39	18 21	0 23	1 18	12 42	1.9	0 17	1.6
0	5 56	18 3	0 22	1 15	12 39	1.7	0 18	1.7
10	6 13	17 46	0 23	1 15	12 37	1.6	0 18	1.9
20	6 32	17 28	0 24	1 19	12 34	1.4	0 19	2.1
30	6 52	17 7	0 26	1 25	12 31	1.2	0 19	2.3
35	7 5	16 55	0 28	1 31	12 29	1.0	0 20	2.5
40	7 19	16 41	0 30	1 37	12 27	.9	0 20	2.6
45	7 35	16 24	0 34	1 47	12 25	.7	0 20	2.8
50	7 56	16 4	0 38	1 59	12 22	.6	0 21	3.0
55	8 22	15 37	0 45	2 17	12 19	.3	0 22	3.2
60	8 60	14 59	0 57	2 45	12 15	.0	0 23	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	0 21.2	-.5	15.8	18 49	1.7	56.0	15.3
12	0 15.0	$T_{\overline{m}_\odot}$ 11 h 59.8 min		Starost 7.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 2	.1	280	-3.8	♃	2 11	.0	68	-2.5
♂	16 3	.1	219	1.6	♄	17 1	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 2.2	23 9.7	260 41.1	179 13.1	23 22.1	119 21.1	16 34.4
2	210 1.9	23 10.0	290 46.1	209 11.4	23 22.7	149 23.2	16 33.5
4	240 1.7	23 10.3	320 51.0	239 9.6	23 23.2	179 25.3	16 32.6
6	270 1.4	23 10.6	350 55.9	269 7.9	23 23.8	209 27.4	16 31.6
8	300 1.1	23 10.9	21 .9	299 6.1	23 24.3	239 29.5	16 30.6
10	330 .9	23 11.2	51 5.8	329 4.4	23 24.9	269 31.6	16 29.7
12	0 .6	23 11.5	81 10.7	359 2.7	23 25.4	299 33.6	16 28.7
14	30 .4	23 11.8	111 15.6	29 .9	23 25.9	329 35.7	16 27.8
16	60 .1	23 12.1	141 20.6	58 59.2	23 26.4	359 37.8	16 26.8
18	89 59.8	23 12.4	171 25.5	88 57.4	23 27.0	29 39.9	16 25.9
20	119 59.6	23 12.6	201 30.4	118 55.7	23 27.5	59 42.0	16 24.9
22	149 59.3	23 12.9	231 35.4	148 53.9	23 28.0	89 44.1	16 24.0
Δ	-1	1		-9	3	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	75 28.4	158	- 6 17.8	-139	328 18.7	-21 58.5	105 5.0	11 59.6
2	104 38.0	158	- 6 45.5	-138	358 24.1	-21 58.6	135 9.6	11 59.5
4	133 47.6	158	- 7 13.2	-137	28 29.6	-21 58.6	165 14.2	11 59.3
6	162 57.2	158	- 7 40.7	-137	58 35.0	-21 58.7	195 18.8	11 59.2
8	192 6.7	158	- 8 8.0	-136	88 40.4	-21 58.8	225 23.4	11 59.1
10	221 16.2	157	- 8 35.1	-135	118 45.9	-21 58.9	255 28.1	11 59.0
12	250 25.7	157	- 9 2.1	-134	148 51.3	-21 59.0	285 32.7	11 58.8
14	279 35.1	157	- 9 28.9	-133	178 56.8	-21 59.1	315 37.3	11 58.7
16	308 44.4	156	- 9 55.5	-132	209 2.2	-21 59.2	345 41.9	11 58.6
18	337 53.7	156	-10 21.9	-131	239 7.7	-21 59.2	15 46.5	11 58.4
20	7 2.9	156	-10 48.2	-130	269 13.1	-21 59.3	45 51.1	11 58.3
22	36 12.0	155	-11 14.2	-129	299 18.6	-21 59.4	75 55.8	11 58.2
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 23	1 41	: ::	14 31	3.6	0 14	.0
55	3 21	20 39	0 58	: ::	14 18	3.2	0 22	.3
50	3 51	20 10	0 44	: ::	14 9	2.9	0 28	.6
45	4 13	19 47	0 37	2 32	14 1	2.7	0 33	.8
40	4 31	19 29	0 33	2 3	13 54	2.6	0 37	.9
35	4 45	19 15	0 30	1 47	13 49	2.4	0 41	1.1
30	4 58	19 2	0 27	1 36	13 44	2.3	0 44	1.2
20	5 20	18 40	0 25	1 24	13 35	2.1	0 50	1.4
10	5 39	18 21	0 23	1 18	13 28	1.9	0 55	1.6
0	5 56	18 4	0 22	1 15	13 21	1.8	0 59	1.7
10	6 14	17 46	0 23	1 15	13 14	1.6	1 4	1.9
20	6 32	17 28	0 24	1 19	13 7	1.4	1 9	2.1
30	6 53	17 7	0 26	1 25	12 59	1.2	1 15	2.3
35	7 5	16 55	0 28	1 31	12 54	1.1	1 18	2.4
40	7 19	16 41	0 30	1 37	12 49	1.0	1 22	2.6
45	7 36	16 24	0 34	1 47	12 43	.8	1 27	2.7
50	7 56	16 4	0 38	1 59	12 36	.6	1 32	2.9
55	8 23	15 37	0 45	2 17	12 27	.4	1 39	3.2
60	9 1	14 59	0 57	2 45	12 15	.0	1 48	3.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	0 8.9	-.5	15.8	19 31	1.8	55.3	15.1
12	0 2.7	$T_{\overline{m}_\odot}$ 11 h 60.0 min		Starost 8.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 4	.1	279	-3.8	♃	2 6	.0	68	-2.5
♂	16 1	.1	219	1.6	♄	16 57	.0	204	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 59.1	23 13.2	261 40.3	178 52.2	23 28.5	119 46.2	16 23.0
2	209 58.8	23 13.5	291 45.2	208 50.4	23 29.0	149 48.3	16 22.1
4	239 58.5	23 13.7	321 50.1	238 48.7	23 29.5	179 50.4	16 21.1
6	269 58.3	23 14.0	351 55.1	268 46.9	23 30.0	209 52.4	16 20.1
8	299 58.0	23 14.3	22 .0	298 45.2	23 30.5	239 54.5	16 19.2
10	329 57.8	23 14.5	52 4.9	328 43.4	23 30.9	269 56.6	16 18.2
12	359 57.5	23 14.8	82 9.9	358 41.7	23 31.4	299 58.7	16 17.3
14	29 57.2	23 15.0	112 14.8	28 39.9	23 31.9	330 .8	16 16.3
16	59 57.0	23 15.3	142 19.7	58 38.1	23 32.4	0 2.9	16 15.3
18	89 56.7	23 15.5	172 24.6	88 36.4	23 32.8	30 5.0	16 14.4
20	119 56.5	23 15.8	202 29.6	118 34.6	23 33.3	60 7.1	16 13.4
22	149 56.2	23 16.0	232 34.5	148 32.9	23 33.7	90 9.2	16 12.4
Δ	-1	1		-9	2	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	65 21.0	155	-11 40.0	-128	329 24.0	-21 59.5	106 .4	11 58.1
2	94 30.0	154	-12 5.6	-127	359 29.5	-21 59.6	136 5.0	11 57.9
4	123 38.8	153	-12 31.0	-126	29 34.9	-21 59.7	166 9.6	11 57.8
6	152 47.5	153	-12 56.1	-125	59 40.4	-21 59.8	196 14.2	11 57.7
8	181 56.0	152	-13 21.0	-123	89 45.8	-21 59.8	226 18.8	11 57.5
10	211 4.5	152	-13 45.7	-122	119 51.3	-21 59.9	256 23.4	11 57.4
12	240 12.8	151	-14 10.2	-121	149 56.7	-22 .0	286 28.0	11 57.3
14	269 21.0	150	-14 34.3	-120	180 2.2	-22 .1	316 32.6	11 57.1
16	298 29.0	149	-14 58.3	-118	210 7.6	-22 .2	346 37.3	11 57.0
18	327 36.8	149	-15 22.0	-117	240 13.1	-22 .3	16 41.9	11 56.9
20	356 44.5	148	-15 45.4	-116	270 18.5	-22 .4	46 46.5	11 56.8
22	25 52.1	147	-16 8.5	-114	300 24.0	-22 .5	76 51.1	11 56.6
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 24	1 42	: ::	15 57	3.6	0 15	.1
55	3 21	20 40	0 58	: ::	15 35	3.2	0 30	.4
50	3 50	20 10	0 44	: ::	15 19	2.9	0 42	.7
45	4 13	19 48	0 37	2 32	15 6	2.7	0 51	.9
40	4 31	19 30	0 33	2 3	14 56	2.6	0 59	1.0
35	4 45	19 15	0 30	1 47	14 47	2.4	1 6	1.1
30	4 58	19 2	0 27	1 36	14 39	2.3	1 12	1.3
20	5 20	18 40	0 25	1 24	14 26	2.1	1 23	1.5
10	5 39	18 21	0 23	1 18	14 14	2.0	1 32	1.6
0	5 56	18 4	0 23	1 15	14 3	1.8	1 41	1.8
10	6 14	17 47	0 23	1 15	13 52	1.7	1 50	1.9
20	6 32	17 28	0 24	1 19	13 41	1.5	1 59	2.1
30	6 53	17 7	0 26	1 25	13 28	1.3	2 10	2.3
35	7 5	16 55	0 28	1 31	13 20	1.2	2 17	2.4
40	7 20	16 41	0 31	1 37	13 12	1.1	2 24	2.6
45	7 36	16 24	0 34	1 47	13 2	.9	2 32	2.7
50	7 57	16 3	0 38	1 59	12 50	.7	2 43	2.9
55	8 24	15 37	0 45	2 17	12 36	.5	2 56	3.2
60	9 2	14 58	0 57	2 45	12 16	.1	3 13	3.6
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 0 3.5	-.5	15.8	$T_{\overline{m}}$	20 13	1.9	54.8	14.9
12	- 0 9.8	$T_{\overline{m}_\odot}$	12 h .2 min	Starost	9.2 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 5	.1	277	-3.8	♆	2 2	.0	68	-2.5
♂	15 60	.1	218	1.6	♄	16 53	.0	204	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 55.9	23 16.3	262 39.4	178 31.1	23 34.2	120 11.3	16 11.5
2	209 55.7	23 16.5	292 44.4	208 29.4	23 34.6	150 13.3	16 10.5
4	239 55.4	23 16.8	322 49.3	238 27.6	23 35.1	180 15.4	16 9.5
6	269 55.1	23 17.0	352 54.2	268 25.8	23 35.5	210 17.5	16 8.6
8	299 54.9	23 17.2	22 59.1	298 24.1	23 35.9	240 19.6	16 7.6
10	329 54.6	23 17.4	53 4.1	328 22.3	23 36.3	270 21.7	16 6.6
12	359 54.3	23 17.7	83 9.0	358 20.5	23 36.8	300 23.8	16 5.7
14	29 54.1	23 17.9	113 13.9	28 18.8	23 37.2	330 25.9	16 4.7
16	59 53.8	23 18.1	143 18.8	58 17.0	23 37.6	0 28.0	16 3.7
18	89 53.5	23 18.3	173 23.8	88 15.3	23 38.0	30 30.1	16 2.8
20	119 53.3	23 18.5	203 28.7	118 13.5	23 38.4	60 32.2	16 1.8
22	149 53.0	23 18.8	233 33.6	148 11.7	23 38.8	90 34.3	16 .8
Δ	-1	1		-9	2	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	54 59.4	146	-16 31.4	-113	330 29.5	-22 .5	106 55.7	11 56.5
2	84 6.6	145	-16 53.9	-111	0 34.9	-22 .6	137 .3	11 56.4
4	113 13.6	144	-17 16.2	-110	30 40.4	-22 .7	167 4.9	11 56.2
6	142 20.4	143	-17 38.2	-108	60 45.8	-22 .8	197 9.5	11 56.1
8	171 27.1	142	-17 59.9	-107	90 51.3	-22 .9	227 14.1	11 56.0
10	200 33.5	141	-18 21.3	-105	120 56.8	-22 1.0	257 18.7	11 55.8
12	229 39.7	140	-18 42.4	-104	151 2.2	-22 1.1	287 23.3	11 55.7
14	258 45.7	139	-19 3.1	-102	181 7.7	-22 1.2	317 27.9	11 55.6
16	287 51.5	138	-19 23.5	-100	211 13.2	-22 1.3	347 32.5	11 55.4
18	316 57.1	137	-19 43.6	-99	241 18.6	-22 1.3	17 37.1	11 55.3
20	346 2.5	136	-20 3.4	-97	271 24.1	-22 1.4	47 41.7	11 55.2
22	15 7.7	135	-20 22.8	-95	301 29.6	-22 1.5	77 46.3	11 55.0
Δ					27	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 25	1 43	: ::	17 24	3.7	0 16	.1
55	3 21	20 41	0 58	: ::	16 53	3.2	0 40	.5
50	3 50	20 11	0 44	: ::	16 30	2.9	0 57	.8
45	4 13	19 48	0 37	2 32	16 12	2.7	1 12	1.0
40	4 31	19 30	0 33	2 3	15 58	2.6	1 23	1.1
35	4 46	19 15	0 30	1 47	15 46	2.5	1 33	1.3
30	4 58	19 2	0 27	1 36	15 35	2.4	1 42	1.4
20	5 20	18 40	0 25	1 24	15 17	2.2	1 58	1.6
10	5 39	18 22	0 23	1 18	15 1	2.0	2 11	1.7
0	5 57	18 4	0 23	1 15	14 47	1.9	2 24	1.9
10	6 14	17 47	0 23	1 15	14 32	1.8	2 37	2.0
20	6 32	17 28	0 24	1 19	14 17	1.6	2 50	2.2
30	6 54	17 7	0 26	1 25	13 59	1.5	3 6	2.3
35	7 6	16 55	0 28	1 31	13 49	1.4	3 15	2.5
40	7 20	16 41	0 31	1 38	13 38	1.2	3 26	2.6
45	7 37	16 24	0 34	1 47	13 24	1.1	3 38	2.7
50	7 57	16 3	0 38	1 59	13 8	.9	3 53	2.9
55	8 24	15 36	0 45	2 17	12 47	.6	4 13	3.2
60	9 3	14 58	0 57	2 46	12 19	.2	4 39	3.7
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 0 16.1	-.5	15.8	$T_{\overline{m}}$	20 58	1.9	54.4	14.8
12	- 0 22.5	$T_{\overline{m}_\odot}$	12 h .4 min	Starost	10.2 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 7	.1	276	-3.8	♆	1 58	.0	68	-2.5
♂	15 58	.1	218	1.6	♄	16 50	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 52.8	23 19.0	263 38.6	178 10.0	23 39.2	120 36.3	15 59.8
2	209 52.5	23 19.2	293 43.5	208 8.2	23 39.5	150 38.4	15 58.9
4	239 52.2	23 19.4	323 48.4	238 6.4	23 39.9	180 40.5	15 57.9
6	269 52.0	23 19.6	353 53.3	268 4.7	23 40.3	210 42.6	15 56.9
8	299 51.7	23 19.8	23 58.3	298 2.9	23 40.7	240 44.7	15 55.9
10	329 51.4	23 20.0	54 3.2	328 1.1	23 41.0	270 46.8	15 55.0
12	359 51.2	23 20.1	84 8.1	357 59.3	23 41.4	300 48.9	15 54.0
14	29 50.9	23 20.3	114 13.1	27 57.6	23 41.8	330 51.0	15 53.0
16	59 50.6	23 20.5	144 18.0	57 55.8	23 42.1	0 53.1	15 52.0
18	89 50.4	23 20.7	174 22.9	87 54.0	23 42.5	30 55.2	15 51.1
20	119 50.1	23 20.9	204 27.8	117 52.3	23 42.8	60 57.3	15 50.1
22	149 49.8	23 21.1	234 32.8	147 50.5	23 43.1	90 59.3	15 49.1
Δ	-1	1		-9	2	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 12.6	134	-20 41.9	-94	331 35.1	-22 1.6	107 50.9	11 54.9
2	73 17.3	132	-21 .6	-92	1 40.5	-22 1.7	137 55.5	11 54.8
4	102 21.8	131	-21 18.9	-90	31 46.0	-22 1.8	168 .1	11 54.6
6	131 26.1	130	-21 36.9	-88	61 51.5	-22 1.9	198 4.7	11 54.5
8	160 30.1	129	-21 54.5	-86	91 56.9	-22 2.0	228 9.3	11 54.4
10	189 33.9	128	-22 11.7	-84	122 2.4	-22 2.1	258 13.9	11 54.2
12	218 37.5	127	-22 28.5	-82	152 7.9	-22 2.1	288 18.5	11 54.1
14	247 40.8	126	-22 44.9	-80	182 13.4	-22 2.2	318 23.1	11 54.0
16	276 43.9	124	-23 1.0	-78	212 18.9	-22 2.3	348 27.7	11 53.8
18	305 46.8	123	-23 16.6	-76	242 24.3	-22 2.4	18 32.3	11 53.7
20	334 49.5	122	-23 31.8	-74	272 29.8	-22 2.5	48 36.9	11 53.5
22	3 51.9	121	-23 46.6	-72	302 35.3	-22 2.6	78 41.5	11 53.4
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 25	1 44	: ::	18 54	3.6	0 19	.3
55	3 20	20 41	0 58	: ::	18 10	3.1	0 53	.8
50	3 50	20 11	0 45	: ::	17 40	2.8	1 17	1.0
45	4 13	19 49	0 37	2 33	17 18	2.6	1 36	1.2
40	4 31	19 31	0 33	2 3	16 60	2.5	1 51	1.4
35	4 46	19 16	0 30	1 47	16 45	2.4	2 4	1.5
30	4 59	19 3	0 27	1 36	16 32	2.4	2 16	1.6
20	5 20	18 41	0 25	1 24	16 9	2.2	2 35	1.7
10	5 39	18 22	0 23	1 18	15 50	2.1	2 52	1.8
0	5 57	18 4	0 23	1 15	15 33	2.0	3 9	2.0
10	6 14	17 47	0 23	1 15	15 15	1.9	3 25	2.1
20	6 33	17 28	0 24	1 19	14 56	1.8	3 42	2.2
30	6 54	17 7	0 26	1 25	14 35	1.7	4 2	2.4
35	7 6	16 55	0 28	1 31	14 22	1.6	4 14	2.4
40	7 20	16 41	0 31	1 38	14 8	1.5	4 28	2.6
45	7 37	16 24	0 34	1 47	13 51	1.4	4 44	2.7
50	7 58	16 3	0 38	1 59	13 30	1.2	5 4	2.9
55	8 25	15 36	0 45	2 17	13 2	.9	5 30	3.2
60	9 3	14 58	0 58	2 46	12 24	.4	6 7	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 0 28.8	-.5	15.8	$T_{\overline{m}}$ 21 44	2.0	54.1	14.8
12	- 0 35.2	$T_{\overline{m}_\odot}$ 12 h .6 min		Starost 11.2 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 8	.1	275	-3.8	♄	1 53	.0	68	-2.5
♂	15 56	.1	217	1.6	♃	16 46	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 49.6	23 21.2	264 37.7	177 48.7	23 43.5	121 1.4	15 48.1
2	209 49.3	23 21.4	294 42.6	207 46.9	23 43.8	151 3.5	15 47.1
4	239 49.0	23 21.6	324 47.6	237 45.2	23 44.1	181 5.6	15 46.1
6	269 48.7	23 21.7	354 52.5	267 43.4	23 44.4	211 7.7	15 45.2
8	299 48.5	23 21.9	24 57.4	297 41.6	23 44.7	241 9.8	15 44.2
10	329 48.2	23 22.1	55 2.3	327 39.8	23 45.0	271 11.9	15 43.2
12	359 47.9	23 22.2	85 7.3	357 38.0	23 45.3	301 14.0	15 42.2
14	29 47.7	23 22.4	115 12.2	27 36.3	23 45.6	331 16.1	15 41.2
16	59 47.4	23 22.5	145 17.1	57 34.5	23 45.9	1 18.2	15 40.2
18	89 47.1	23 22.7	175 22.1	87 32.7	23 46.2	31 20.3	15 39.2
20	119 46.9	23 22.8	205 27.0	117 30.9	23 46.5	61 22.3	15 38.3
22	149 46.6	23 22.9	235 31.9	147 29.1	23 46.8	91 24.4	15 37.3
Δ	-1	1		-9	2	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	32 54.1	120	-24 1.0	-70	332 40.8	-22 2.7	108 46.1	11 53.3
2	61 56.0	119	-24 14.9	-68	2 46.3	-22 2.8	138 50.7	11 53.1
4	90 57.8	118	-24 28.4	-65	32 51.7	-22 2.9	168 55.3	11 53.0
6	119 59.3	117	-24 41.5	-63	62 57.2	-22 2.9	198 59.9	11 52.9
8	149 .6	115	-24 54.1	-61	93 2.7	-22 3.0	229 4.5	11 52.7
10	178 1.7	114	-25 6.3	-59	123 8.2	-22 3.1	259 9.1	11 52.6
12	207 2.6	113	-25 18.0	-56	153 13.7	-22 3.2	289 13.7	11 52.5
14	236 3.3	112	-25 29.2	-54	183 19.2	-22 3.3	319 18.2	11 52.3
16	265 3.8	111	-25 40.0	-52	213 24.7	-22 3.4	349 22.8	11 52.2
18	294 4.1	110	-25 50.3	-49	243 30.2	-22 3.5	19 27.4	11 52.0
20	323 4.2	110	-26 .1	-47	273 35.6	-22 3.6	49 32.0	11 51.9
22	352 4.1	109	-26 9.5	-44	303 41.1	-22 3.7	79 36.6	11 51.8
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 26	1 45	: ::	20 21	3.1	0 26	.6
55	3 20	20 42	0 58	: ::	19 24	2.7	1 11	1.1
50	3 50	20 12	0 45	: ::	18 47	2.6	1 41	1.4
45	4 13	19 49	0 37	2 33	18 21	2.5	2 5	1.5
40	4 31	19 31	0 33	2 3	18 0	2.4	2 23	1.6
35	4 46	19 16	0 30	1 47	17 43	2.3	2 39	1.7
30	4 59	19 3	0 27	1 37	17 28	2.3	2 53	1.8
20	5 21	18 41	0 25	1 24	17 3	2.2	3 16	1.9
10	5 40	18 22	0 23	1 18	16 41	2.2	3 37	2.0
0	5 57	18 4	0 23	1 15	16 21	2.1	3 56	2.1
10	6 15	17 47	0 23	1 15	16 1	2.0	4 15	2.1
20	6 33	17 29	0 24	1 19	15 39	2.0	4 35	2.2
30	6 54	17 7	0 26	1 25	15 14	1.9	4 59	2.3
35	7 7	16 55	0 28	1 31	14 60	1.8	5 13	2.4
40	7 21	16 41	0 31	1 38	14 43	1.8	5 29	2.5
45	7 37	16 24	0 34	1 47	14 23	1.7	5 48	2.6
50	7 58	16 3	0 38	1 59	13 58	1.6	6 13	2.7
55	8 25	15 36	0 46	2 18	13 24	1.4	6 46	2.9
60	9 4	14 58	0 58	2 46	12 34	.9	7 35	3.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 0 41.6	-.5	15.8	$T_{\overline{m}}$ 22 33	2.1	54.0	14.7
12	- 0 48.1	$T_{\overline{m}_\odot}$ 12 h .8 min		Starost 12.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 9	.1	273	-3.8	♄	1 49	.0	68	-2.5
♂	15 55	.1	216	1.6	♃	16 42	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 46.3	23 23.1	265 36.8	177 27.4	23 47.1	121 26.5	15 36.3
2	209 46.1	23 23.2	295 41.8	207 25.6	23 47.3	151 28.6	15 35.3
4	239 45.8	23 23.4	325 46.7	237 23.8	23 47.6	181 30.7	15 34.3
6	269 45.5	23 23.5	355 51.6	267 22.0	23 47.9	211 32.8	15 33.3
8	299 45.3	23 23.6	25 56.6	297 20.2	23 48.1	241 34.9	15 32.3
10	329 45.0	23 23.7	56 1.5	327 18.5	23 48.4	271 37.0	15 31.3
12	359 44.7	23 23.9	86 6.4	357 16.7	23 48.6	301 39.1	15 30.3
14	29 44.4	23 24.0	116 11.3	27 14.9	23 48.8	331 41.2	15 29.3
16	59 44.2	23 24.1	146 16.3	57 13.1	23 49.1	1 43.3	15 28.3
18	89 43.9	23 24.2	176 21.2	87 11.3	23 49.3	31 45.4	15 27.3
20	119 43.6	23 24.3	206 26.1	117 9.5	23 49.5	61 47.5	15 26.4
22	149 43.4	23 24.4	236 31.1	147 7.8	23 49.7	91 49.5	15 25.4
Δ	-1	1		-9	1	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	21 3.8	108	-26 18.3	-42	333 46.6	-22 3.8	109 41.2	11 51.6
2	50 3.3	107	-26 26.7	-39	3 52.1	-22 3.9	139 45.8	11 51.5
4	79 2.7	106	-26 34.6	-37	33 57.6	-22 3.9	169 50.4	11 51.3
6	108 1.9	105	-26 41.9	-34	64 3.1	-22 4.0	199 54.9	11 51.2
8	137 1.0	105	-26 48.8	-32	94 8.6	-22 4.1	229 59.5	11 51.1
10	165 59.9	104	-26 55.2	-29	124 14.1	-22 4.2	260 4.1	11 50.9
12	194 58.7	103	-27 1.0	-27	154 19.6	-22 4.3	290 8.7	11 50.8
14	223 57.4	103	-27 6.3	-24	184 25.1	-22 4.4	320 13.3	11 50.6
16	252 55.9	102	-27 11.1	-21	214 30.6	-22 4.5	350 17.9	11 50.5
18	281 54.3	102	-27 15.4	-19	244 36.1	-22 4.6	20 22.5	11 50.4
20	310 52.6	101	-27 19.2	-16	274 41.6	-22 4.7	50 27.0	11 50.2
22	339 50.9	101	-27 22.4	-14	304 47.1	-22 4.8	80 31.6	11 50.1
Δ					27	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 27	1 46	: ::	21 36	2.1	0 39	1.2
55	3 20	20 42	0 58	: ::	20 29	2.1	1 37	1.6
50	3 50	20 12	0 45	: ::	19 49	2.2	2 14	1.8
45	4 13	19 49	0 37	2 33	19 20	2.2	2 41	1.9
40	4 31	19 31	0 33	2 3	18 58	2.2	3 2	1.9
35	4 46	19 16	0 30	1 47	18 39	2.2	3 20	2.0
30	4 59	19 3	0 27	1 37	18 23	2.2	3 35	2.0
20	5 21	18 41	0 25	1 24	17 56	2.2	4 1	2.0
10	5 40	18 22	0 23	1 18	17 33	2.1	4 24	2.1
0	5 57	18 5	0 23	1 15	17 11	2.1	4 45	2.1
10	6 15	17 47	0 23	1 15	16 50	2.1	5 6	2.2
20	6 33	17 29	0 24	1 19	16 26	2.1	5 29	2.2
30	6 55	17 8	0 26	1 26	15 60	2.1	5 55	2.2
35	7 7	16 55	0 28	1 31	15 44	2.1	6 10	2.3
40	7 21	16 41	0 31	1 38	15 26	2.1	6 28	2.3
45	7 38	16 24	0 34	1 47	15 4	2.1	6 50	2.3
50	7 59	16 3	0 38	1 60	14 36	2.0	7 18	2.4
55	8 26	15 36	0 46	2 18	13 57	2.0	7 56	2.4
60	9 4	14 58	0 58	2 46	12 55	1.8	8 58	2.7
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 0 54.5	-.5	15.8	$T_{\overline{m}}$ 23 23	2.2	54.0	14.7
12	- 1 1.0	$T_{\overline{m}_\odot}$ 12 h 1.0 min		Starost 13.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 11	.1	272	-3.8	♄	1 45	.0	68	-2.5
♂	15 53	.1	216	1.6	♃	16 39	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 43.1	23 24.5	266 36.0	177 6.0	23 50.0	121 51.6	15 24.4
2	209 42.8	23 24.6	296 40.9	207 4.2	23 50.2	151 53.7	15 23.4
4	239 42.6	23 24.7	326 45.8	237 2.4	23 50.4	181 55.8	15 22.4
6	269 42.3	23 24.8	356 50.8	267 .6	23 50.6	211 57.9	15 21.4
8	299 42.0	23 24.9	26 55.7	296 58.8	23 50.8	242 .0	15 20.4
10	329 41.8	23 25.0	57 .6	326 57.0	23 51.0	272 2.1	15 19.4
12	359 41.5	23 25.1	87 5.5	356 55.2	23 51.2	302 4.2	15 18.4
14	29 41.2	23 25.2	117 10.5	26 53.5	23 51.3	332 6.3	15 17.4
16	59 40.9	23 25.3	147 15.4	56 51.7	23 51.5	2 8.4	15 16.4
18	89 40.7	23 25.3	177 20.3	86 49.9	23 51.7	32 10.5	15 15.3
20	119 40.4	23 25.4	207 25.3	116 48.1	23 51.8	62 12.6	15 14.3
22	149 40.1	23 25.5	237 30.2	146 46.3	23 52.0	92 14.7	15 13.3
Δ	-1	0		-9	1	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	8 49.0	100	-27 25.1	-11	334 52.6	-22 4.9	110 36.2	11 49.9
2	37 47.0	100	-27 27.3	-8	4 58.1	-22 5.0	140 40.8	11 49.8
4	66 45.0	100	-27 28.9	-6	35 3.6	-22 5.0	170 45.4	11 49.7
6	95 43.0	99	-27 30.0	-3	65 9.1	-22 5.1	200 49.9	11 49.5
8	124 40.8	99	-27 30.6	0	95 14.6	-22 5.2	230 54.5	11 49.4
10	153 38.7	99	-27 30.6	3	125 20.1	-22 5.3	260 59.1	11 49.2
12	182 36.5	99	-27 30.1	5	155 25.6	-22 5.4	291 3.7	11 49.1
14	211 34.3	99	-27 29.0	8	185 31.1	-22 5.5	321 8.3	11 48.9
16	240 32.1	99	-27 27.5	11	215 36.6	-22 5.6	351 12.8	11 48.8
18	269 29.9	99	-27 25.3	13	245 42.2	-22 5.7	21 17.4	11 48.7
20	298 27.7	99	-27 22.7	16	275 47.7	-22 5.8	51 22.0	11 48.5
22	327 25.5	99	-27 19.5	19	305 53.2	-22 5.9	81 26.6	11 48.4
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 27	1 46	: ::	22 27	1.1	1 9	2.4
55	3 20	20 42	0 58	: ::	21 20	1.5	2 17	2.3
50	3 50	20 12	0 45	: ::	20 41	1.7	2 57	2.3
45	4 13	19 50	0 37	2 33	20 12	1.8	3 26	2.2
40	4 31	19 32	0 33	2 3	19 49	1.9	3 49	2.2
35	4 46	19 17	0 30	1 47	19 31	1.9	4 7	2.2
30	4 59	19 4	0 27	1 37	19 15	2.0	4 23	2.2
20	5 21	18 42	0 25	1 24	18 48	2.0	4 51	2.2
10	5 40	18 23	0 23	1 18	18 24	2.1	5 14	2.2
0	5 58	18 5	0 23	1 15	18 2	2.1	5 36	2.1
10	6 15	17 47	0 23	1 15	17 41	2.2	5 58	2.1
20	6 34	17 29	0 24	1 19	17 17	2.2	6 21	2.1
30	6 55	17 8	0 26	1 26	16 50	2.3	6 48	2.1
35	7 7	16 55	0 28	1 31	16 34	2.3	7 4	2.1
40	7 21	16 41	0 31	1 38	16 16	2.4	7 23	2.0
45	7 38	16 24	0 34	1 47	15 53	2.4	7 46	2.0
50	7 59	16 3	0 39	1 60	15 24	2.5	8 14	1.9
55	8 26	15 36	0 46	2 18	14 44	2.6	8 54	1.8
60	9 5	14 58	0 58	2 46	13 38	2.9	10 1	1.6
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 1 7.4	-.5	15.8	$T_{\overline{m}}$ . . .	1.0	54.0	14.7
12	- 1 13.9	$T_{\overline{m}_\odot}$ 12 h 1.2 min		Starost 14.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 12	.1	270	-3.8	♄	1 40	.0	68	-2.5
♂	15 51	.1	215	1.6	♃	16 35	.0	204	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 39.9	23 25.6	267 35.1	176 44.5	23 52.2	122 16.7	15 12.3
2	209 39.6	23 25.6	297 40.0	206 42.7	23 52.3	152 18.8	15 11.3
4	239 39.3	23 25.7	327 45.0	236 40.9	23 52.5	182 20.9	15 10.3
6	269 39.0	23 25.8	357 49.9	266 39.1	23 52.6	212 23.0	15 9.3
8	299 38.8	23 25.8	27 54.8	296 37.4	23 52.7	242 25.1	15 8.3
10	329 38.5	23 25.9	57 59.8	326 35.6	23 52.9	272 27.2	15 7.3
12	359 38.2	23 25.9	88 4.7	356 33.8	23 53.0	302 29.3	15 6.3
14	29 38.0	23 26.0	118 9.6	26 32.0	23 53.1	332 31.4	15 5.3
16	59 37.7	23 26.0	148 14.5	56 30.2	23 53.2	2 33.5	15 4.3
18	89 37.4	23 26.1	178 19.5	86 28.4	23 53.3	32 35.6	15 3.3
20	119 37.2	23 26.1	208 24.4	116 26.6	23 53.5	62 37.7	15 2.2
22	149 36.9	23 26.2	238 29.3	146 24.8	23 53.6	92 39.8	15 1.2
Δ	-1	0		-9	1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	356 23.3	99	-27 15.7	21	335 58.7	-22 6.0	111 31.1	11 48.2
2	25 21.2	100	-27 11.5	24	6 4.2	-22 6.1	141 35.7	11 48.1
4	54 19.1	100	-27 6.6	27	36 9.7	-22 6.2	171 40.3	11 47.9
6	83 17.1	100	-27 1.3	29	66 15.2	-22 6.3	201 44.9	11 47.8
8	112 15.2	101	-26 55.4	32	96 20.7	-22 6.3	231 49.4	11 47.7
10	141 13.3	101	-26 49.0	35	126 26.3	-22 6.4	261 54.0	11 47.5
12	170 11.5	102	-26 42.1	37	156 31.8	-22 6.5	291 58.6	11 47.4
14	199 9.9	102	-26 34.6	40	186 37.3	-22 6.6	322 3.2	11 47.2
16	228 8.3	103	-26 26.6	42	216 42.8	-22 6.7	352 7.7	11 47.1
18	257 6.8	103	-26 18.1	45	246 48.3	-22 6.8	22 12.3	11 46.9
20	286 5.4	104	-26 9.1	48	276 53.9	-22 6.9	52 16.9	11 46.8
22	315 4.2	104	-25 59.6	50	306 59.4	-22 7.0	82 21.4	11 46.6
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 27	1 47	: ::	22 52	.5	2 6	3.4
55	3 20	20 43	0 58	: ::	21 57	1.0	3 12	2.9
50	3 50	20 13	0 45	: ::	21 22	1.3	3 51	2.7
45	4 13	19 50	0 37	2 33	20 55	1.5	4 20	2.6
40	4 31	19 32	0 33	2 3	20 34	1.6	4 42	2.5
35	4 46	19 17	0 30	1 47	20 17	1.7	5 0	2.4
30	4 59	19 4	0 27	1 37	20 2	1.8	5 16	2.4
20	5 21	18 42	0 25	1 24	19 37	1.9	5 43	2.3
10	5 40	18 23	0 23	1 18	19 14	2.0	6 6	2.2
0	5 58	18 5	0 23	1 15	18 54	2.1	6 27	2.1
10	6 15	17 48	0 23	1 15	18 33	2.2	6 49	2.0
20	6 34	17 29	0 24	1 19	18 11	2.3	7 12	2.0
30	6 55	17 8	0 26	1 26	17 45	2.4	7 38	1.9
35	7 7	16 55	0 28	1 31	17 30	2.5	7 54	1.8
40	7 22	16 41	0 31	1 38	17 12	2.6	8 12	1.7
45	7 38	16 24	0 34	1 47	16 51	2.7	8 33	1.6
50	7 59	16 4	0 39	1 60	16 24	2.8	9 1	1.5
55	8 26	15 36	0 46	2 18	15 47	3.1	9 38	1.3
60	9 5	14 58	0 58	2 46	14 47	3.6	10 39	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 20.4	-.5	15.8	$T_{\overline{m}}$ 0 15	2.1	54.2	14.8
12	- 1 26.9	$T_{\overline{m}_\odot}$ 12 h	1.5 min	Starost 15.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 14	.1	269	-3.8	♃	1 36	.0	68	-2.5
♂	15 50	.1	215	1.6	♄	16 31	.0	204	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 36.6	23 26.2	268 34.3	176 23.0	23 53.7	122 41.9	15 .2
2	209 36.3	23 26.2	298 39.2	206 21.2	23 53.7	152 44.0	14 59.2
4	239 36.1	23 26.3	328 44.1	236 19.4	23 53.8	182 46.1	14 58.2
6	269 35.8	23 26.3	358 49.0	266 17.6	23 53.9	212 48.1	14 57.2
8	299 35.5	23 26.3	28 54.0	296 15.9	23 54.0	242 50.2	14 56.2
10	329 35.3	23 26.3	58 58.9	326 14.1	23 54.1	272 52.3	14 55.1
12	359 35.0	23 26.3	89 3.8	356 12.3	23 54.1	302 54.4	14 54.1
14	29 34.7	23 26.4	119 8.8	26 10.5	23 54.2	332 56.5	14 53.1
16	59 34.4	23 26.4	149 13.7	56 8.7	23 54.3	2 58.6	14 52.1
18	89 34.2	23 26.4	179 18.6	86 6.9	23 54.3	33 .7	14 51.1
20	119 33.9	23 26.4	209 23.5	116 5.1	23 54.4	63 2.8	14 50.1
22	149 33.6	23 26.4	239 28.5	146 3.3	23 54.4	93 4.9	14 49.0
Δ	-1	0		-9	0	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	344 3.1	105	-25 49.5	53	337 4.9	-22 7.1	112 26.0	11 46.5
2	13 2.2	106	-25 39.0	55	7 10.4	-22 7.2	142 30.6	11 46.4
4	42 1.3	107	-25 27.9	58	37 15.9	-22 7.3	172 35.1	11 46.2
6	71 .7	107	-25 16.4	60	67 21.5	-22 7.4	202 39.7	11 46.1
8	100 .2	108	-25 4.3	63	97 27.0	-22 7.5	232 44.3	11 45.9
10	128 59.8	109	-24 51.8	65	127 32.5	-22 7.6	262 48.8	11 45.8
12	157 59.6	110	-24 38.8	67	157 38.0	-22 7.7	292 53.4	11 45.6
14	186 59.6	111	-24 25.3	70	187 43.6	-22 7.7	322 58.0	11 45.5
16	215 59.8	112	-24 11.3	72	217 49.1	-22 7.8	353 2.5	11 45.3
18	245 .2	113	-23 56.9	74	247 54.6	-22 7.9	23 7.1	11 45.2
20	274 .7	114	-23 42.0	77	278 .2	-22 8.0	53 11.7	11 45.0
22	303 1.4	115	-23 26.6	79	308 5.7	-22 8.1	83 16.2	11 44.9
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	23 4	.2	3 27	3.8
55	3 20	20 43	0 58	: ::	22 22	.7	4 21	3.2
50	3 51	20 13	0 45	: ::	21 53	1.0	4 55	2.9
45	4 13	19 50	0 37	2 33	21 31	1.2	5 21	2.8
40	4 31	19 32	0 33	2 3	21 13	1.3	5 41	2.6
35	4 46	19 17	0 30	1 47	20 58	1.5	5 58	2.5
30	4 59	19 4	0 27	1 37	20 44	1.6	6 13	2.4
20	5 21	18 42	0 25	1 24	20 22	1.7	6 37	2.3
10	5 40	18 23	0 23	1 18	20 2	1.9	6 58	2.2
0	5 58	18 5	0 23	1 15	19 44	2.0	7 18	2.0
10	6 15	17 48	0 23	1 15	19 25	2.1	7 38	1.9
20	6 34	17 29	0 24	1 19	19 6	2.3	7 59	1.8
30	6 55	17 8	0 26	1 26	18 43	2.4	8 23	1.7
35	7 8	16 56	0 28	1 31	18 29	2.5	8 37	1.6
40	7 22	16 41	0 31	1 38	18 14	2.7	8 53	1.5
45	7 39	16 25	0 34	1 47	17 55	2.8	9 13	1.3
50	7 60	16 4	0 39	1 60	17 32	3.0	9 37	1.1
55	8 27	15 37	0 46	2 18	17 0	3.3	10 9	.9
60	9 6	14 58	0 58	2 46	16 14	3.8	10 57	.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 33.4	-.5	15.8	$T_{\overline{m}}$ 1 6	2.1	54.5	14.8
12	- 1 39.9	$T_{\overline{m}_\odot}$ 12 h	1.7 min	Starost 16.2 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 15	.1	268	-3.8	♃	1 31	.0	69	-2.5
♂	15 48	.1	214	1.6	♄	16 28	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 33.4	23 26.4	269 33.4	176 1.5	23 54.4	123 7.0	14 48.0
2	209 33.1	23 26.4	299 38.3	205 59.7	23 54.5	153 9.1	14 47.0
4	239 32.8	23 26.4	329 43.3	235 57.9	23 54.5	183 11.2	14 46.0
6	269 32.6	23 26.4	359 48.2	265 56.1	23 54.5	213 13.3	14 44.9
8	299 32.3	23 26.4	29 53.1	295 54.3	23 54.5	243 15.4	14 43.9
10	329 32.0	23 26.4	59 58.0	325 52.5	23 54.6	273 17.5	14 42.9
12	359 31.7	23 26.3	90 3.0	355 50.7	23 54.6	303 19.6	14 41.9
14	29 31.5	23 26.3	120 7.9	25 49.0	23 54.6	333 21.6	14 40.8
16	59 31.2	23 26.3	150 12.8	55 47.2	23 54.6	3 23.7	14 39.8
18	89 30.9	23 26.3	180 17.7	85 45.4	23 54.6	33 25.8	14 38.8
20	119 30.7	23 26.3	210 22.7	115 43.6	23 54.6	63 27.9	14 37.8
22	149 30.4	23 26.2	240 27.6	145 41.8	23 54.5	93 30.0	14 36.7
Δ	-1	0		-9	0	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{h}	SATURN δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	332 2.3	116	-23 10.8	81	338 11.2	-22 8.2	113 20.8	11 44.7
2	1 3.5	117	-22 54.6	83	8 16.7	-22 8.3	143 25.4	11 44.6
4	30 4.8	117	-22 37.9	86	38 22.3	-22 8.4	173 29.9	11 44.4
6	59 6.3	118	-22 20.7	88	68 27.8	-22 8.5	203 34.5	11 44.3
8	88 8.0	119	-22 3.2	90	98 33.3	-22 8.6	233 39.0	11 44.1
10	117 9.8	120	-21 45.2	92	128 38.9	-22 8.7	263 43.6	11 44.0
12	146 11.9	121	-21 26.8	94	158 44.4	-22 8.8	293 48.2	11 43.8
14	175 14.2	122	-21 8.0	96	188 49.9	-22 8.9	323 52.7	11 43.7
16	204 16.7	123	-20 48.8	98	218 55.5	-22 9.0	353 57.3	11 43.5
18	233 19.4	124	-20 29.1	100	249 1.0	-22 9.1	24 1.8	11 43.4
20	262 22.3	125	-20 9.1	102	279 6.6	-22 9.2	54 6.4	11 43.2
22	291 25.4	126	-19 48.7	104	309 12.1	-22 9.3	84 11.0	11 43.1
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 47	: ::	23 9	.1	4 57	3.8
55	3 21	20 43	0 58	: ::	22 39	.5	5 38	3.4
50	3 51	20 13	0 45	: ::	22 17	.8	6 6	3.1
45	4 13	19 50	0 37	2 33	21 59	1.0	6 27	2.8
40	4 31	19 32	0 33	2 3	21 45	1.2	6 44	2.7
35	4 46	19 17	0 30	1 47	21 33	1.3	6 59	2.6
30	4 59	19 4	0 27	1 37	21 22	1.4	7 11	2.4
20	5 22	18 42	0 25	1 24	21 3	1.6	7 32	2.3
10	5 41	18 23	0 23	1 18	20 47	1.8	7 50	2.1
0	5 58	18 6	0 23	1 15	20 32	1.9	8 7	2.0
10	6 16	17 48	0 23	1 15	20 17	2.1	8 24	1.8
20	6 34	17 30	0 24	1 19	20 0	2.2	8 42	1.7
30	6 56	17 8	0 26	1 26	19 41	2.4	9 3	1.5
35	7 8	16 56	0 28	1 31	19 30	2.6	9 15	1.4
40	7 22	16 42	0 31	1 38	19 17	2.7	9 28	1.2
45	7 39	16 25	0 34	1 47	19 2	2.9	9 44	1.1
50	7 60	16 4	0 39	1 60	18 44	3.1	10 4	.9
55	8 27	15 37	0 46	2 18	18 19	3.4	10 30	.6
60	9 6	14 58	0 58	2 46	17 45	3.8	11 5	.2
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 1 46.4	-.5	15.8	$T_{\overline{m}}$ 1 56	2.0	54.8	14.9
12	- 1 52.8	$T_{\overline{m}_\odot}$ 12 h	1.9 min	Starost 17.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 17	.1	266	-3.8	♃	1 27	.0	69	-2.5
♂	15 46	.1	214	1.6	♄	16 24	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 30.1	23 26.2	270 32.5	175 40.0	23 54.5	123 32.1	14 35.7
2	209 29.9	23 26.2	300 37.5	205 38.2	23 54.5	153 34.2	14 34.7
4	239 29.6	23 26.1	330 42.4	235 36.4	23 54.5	183 36.3	14 33.6
6	269 29.3	23 26.1	0 47.3	265 34.6	23 54.4	213 38.4	14 32.6
8	299 29.0	23 26.0	30 52.2	295 32.8	23 54.4	243 40.5	14 31.6
10	329 28.8	23 26.0	60 57.2	325 31.0	23 54.3	273 42.6	14 30.6
12	359 28.5	23 25.9	91 2.1	355 29.2	23 54.3	303 44.7	14 29.5
14	29 28.2	23 25.9	121 7.0	25 27.4	23 54.2	333 46.8	14 28.5
16	59 28.0	23 25.8	151 12.0	55 25.6	23 54.2	3 48.9	14 27.5
18	89 27.7	23 25.8	181 16.9	85 23.8	23 54.1	33 51.0	14 26.4
20	119 27.4	23 25.7	211 21.8	115 22.1	23 54.0	63 53.1	14 25.4
22	149 27.2	23 25.6	241 26.7	145 20.3	23 54.0	93 55.2	14 24.4
Δ	-1	0		-9	0	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{h}	SATURN δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	320 28.7	127	-19 28.0	106	339 17.6	-22 9.4	114 15.5	11 42.9
2	349 32.1	128	-19 6.8	108	9 23.2	-22 9.5	144 20.1	11 42.8
4	18 35.8	129	-18 45.3	109	39 28.7	-22 9.5	174 24.6	11 42.6
6	47 39.6	130	-18 23.4	111	69 34.3	-22 9.6	204 29.2	11 42.5
8	76 43.7	131	-18 1.2	113	99 39.8	-22 9.7	234 33.7	11 42.3
10	105 47.9	132	-17 38.6	115	129 45.3	-22 9.8	264 38.3	11 42.2
12	134 52.2	133	-17 15.7	116	159 50.9	-22 9.9	294 42.8	11 42.0
14	163 56.8	134	-16 52.5	118	189 56.4	-22 10.0	324 47.4	11 41.9
16	193 1.5	134	-16 28.9	119	220 2.0	-22 10.1	354 52.0	11 41.7
18	222 6.4	135	-16 5.0	121	250 7.5	-22 10.2	24 56.5	11 41.6
20	251 11.5	136	-15 40.8	123	280 13.1	-22 10.3	55 1.1	11 41.4
22	280 16.7	137	-15 16.3	124	310 18.6	-22 10.4	85 5.6	11 41.3
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 46	: ::	23 12	.1	6 30	3.8
55	3 21	20 43	0 58	: ::	22 52	.4	6 58	3.4
50	3 51	20 13	0 45	: ::	22 36	.7	7 19	3.1
45	4 14	19 51	0 37	2 33	22 23	.9	7 35	2.9
40	4 32	19 33	0 33	2 3	22 13	1.0	7 49	2.7
35	4 47	19 17	0 30	1 47	22 4	1.2	7 60	2.6
30	4 60	19 4	0 27	1 37	21 56	1.3	8 10	2.4
20	5 22	18 42	0 25	1 24	21 42	1.5	8 26	2.2
10	5 41	18 23	0 23	1 18	21 30	1.7	8 41	2.0
0	5 58	18 6	0 23	1 15	21 18	1.9	8 54	1.9
10	6 16	17 48	0 23	1 15	21 7	2.0	9 8	1.7
20	6 34	17 30	0 24	1 19	20 54	2.2	9 22	1.5
30	6 56	17 9	0 26	1 26	20 40	2.4	9 38	1.3
35	7 8	16 56	0 28	1 31	20 32	2.6	9 47	1.2
40	7 22	16 42	0 31	1 38	20 22	2.7	9 58	1.1
45	7 39	16 25	0 34	1 47	20 11	2.9	10 11	.9
50	7 60	16 4	0 39	1 60	19 57	3.1	10 26	.7
55	8 27	15 37	0 46	2 18	19 40	3.4	10 44	.5
60	9 6	14 58	0 58	2 46	19 17	3.8	11 10	.1
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 1 59.3	-.5	15.8	$T_{\overline{m}}$ 2 43	1.9	55.2	15.0
12	- 2 5.8	$T_{\overline{m}_\odot}$ 12 h	2.1 min	Starost 18.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 18	.1	265	-3.8	♃	1 23	.0	69	-2.5
♂	15 45	.1	213	1.6	♄	16 20	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 26.9	23 25.6	271 31.7	175 18.5	23 53.9	123 57.3	14 23.3
2	209 26.6	23 25.5	301 36.6	205 16.7	23 53.8	153 59.4	14 22.3
4	239 26.4	23 25.4	331 41.5	235 14.9	23 53.7	184 1.4	14 21.2
6	269 26.1	23 25.4	1 46.5	265 13.1	23 53.6	214 3.5	14 20.2
8	299 25.8	23 25.3	31 51.4	295 11.3	23 53.5	244 5.6	14 19.2
10	329 25.6	23 25.2	61 56.3	325 9.5	23 53.4	274 7.7	14 18.1
12	359 25.3	23 25.1	92 1.2	355 7.7	23 53.3	304 9.8	14 17.1
14	29 25.0	23 25.0	122 6.2	25 5.9	23 53.2	334 11.9	14 16.0
16	59 24.8	23 24.9	152 11.1	55 4.1	23 53.1	4 14.0	14 15.0
18	89 24.5	23 24.8	182 16.0	85 2.3	23 52.9	34 16.1	14 14.0
20	119 24.2	23 24.7	212 21.0	115 .5	23 52.8	64 18.2	14 12.9
22	149 24.0	23 24.6	242 25.9	144 58.8	23 52.7	94 20.3	14 11.9
Δ	-1	0		-9	-1	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	309 22.0	138	-14 51.5	125	340 24.2	-22 10.5	115 10.2	11 41.1
2	338 27.5	138	-14 26.4	127	10 29.7	-22 10.6	145 14.7	11 41.0
4	7 33.2	139	-14 1.0	128	40 35.3	-22 10.7	175 19.3	11 40.8
6	36 39.0	139	-13 35.4	130	70 40.8	-22 10.8	205 23.8	11 40.7
8	65 44.8	140	-13 9.5	131	100 46.4	-22 10.9	235 28.4	11 40.5
10	94 50.9	141	-12 43.3	132	130 51.9	-22 11.0	265 32.9	11 40.4
12	123 57.0	141	-12 16.8	134	160 57.5	-22 11.1	295 37.5	11 40.2
14	153 3.2	142	-11 50.1	135	191 3.0	-22 11.2	325 42.0	11 40.1
16	182 9.6	142	-11 23.2	136	221 8.6	-22 11.3	355 46.6	11 39.9
18	211 16.0	143	-10 56.0	137	251 14.1	-22 11.4	25 51.1	11 39.7
20	240 22.5	143	-10 28.6	138	281 19.7	-22 11.5	55 55.7	11 39.6
22	269 29.1	143	-10 .9	139	311 25.2	-22 11.6	86 .2	11 39.4
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 36	21 28	1 46	: ::	23 14	.0	8 1	3.7
55	3 21	20 43	0 58	: ::	23 1	.4	8 19	3.4
50	3 51	20 13	0 45	: ::	22 52	.6	8 33	3.1
45	4 14	19 51	0 37	2 33	22 44	.8	8 44	2.9
40	4 32	19 33	0 33	2 3	22 37	1.0	8 54	2.7
35	4 47	19 18	0 30	1 47	22 32	1.1	9 1	2.6
30	4 60	19 5	0 27	1 37	22 26	1.2	9 8	2.4
20	5 22	18 43	0 25	1 24	22 18	1.5	9 20	2.2
10	5 41	18 24	0 23	1 18	22 10	1.6	9 30	2.0
0	5 59	18 6	0 23	1 15	22 3	1.8	9 40	1.8
10	6 16	17 49	0 23	1 15	21 55	2.0	9 49	1.7
20	6 35	17 30	0 24	1 19	21 47	2.2	9 59	1.5
30	6 56	17 9	0 26	1 26	21 38	2.4	10 10	1.3
35	7 8	16 56	0 28	1 31	21 33	2.6	10 17	1.1
40	7 22	16 42	0 31	1 38	21 27	2.7	10 24	1.0
45	7 39	16 25	0 34	1 47	21 20	2.9	10 33	.8
50	8 0	16 5	0 39	1 60	21 12	3.1	10 43	.6
55	8 27	15 37	0 46	2 18	21 1	3.4	10 55	.4
60	9 6	14 59	0 58	2 46	20 47	3.7	11 12	.0
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′		h min	min	′	′
00	− 2 12.2	-.5	15.8	$T_{\overline{m}}$	3 29	1.8	55.7	15.2
12	− 2 18.6	$T_{\overline{m}_\odot}$ 12 h 2.3 min		Starost 19.2 d	Faza ◑			

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 20	.1	264	-3.8	♃	1 18	.0	69	-2.5
♂	15 43	.1	212	1.6	♄	16 17	.0	204	.7

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 23.7	23 24.5	272 30.8	174 57.0	23 52.5	124 22.4	14 10.8
2	209 23.4	23 24.4	302 35.7	204 55.2	23 52.4	154 24.5	14 9.8
4	239 23.2	23 24.3	332 40.7	234 53.4	23 52.3	184 26.6	14 8.7
6	269 22.9	23 24.2	2 45.6	264 51.6	23 52.1	214 28.7	14 7.7
8	299 22.6	23 24.1	32 50.5	294 49.8	23 51.9	244 30.8	14 6.6
10	329 22.4	23 24.0	62 55.5	324 48.0	23 51.8	274 32.9	14 5.6
12	359 22.1	23 23.9	93 .4	354 46.2	23 51.6	304 35.0	14 4.6
14	29 21.8	23 23.8	123 5.3	24 44.4	23 51.4	334 37.1	14 3.5
16	59 21.6	23 23.6	153 10.2	54 42.6	23 51.3	4 39.2	14 2.5
18	89 21.3	23 23.5	183 15.2	84 40.9	23 51.1	34 41.3	14 1.4
20	119 21.0	23 23.4	213 20.1	114 39.1	23 50.9	64 43.4	14 .4
22	149 20.8	23 23.2	243 25.0	144 37.3	23 50.7	94 45.5	13 59.3
Δ	-1	-1		-9	-1	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	298 35.8	144	- 9 33.1	140	341 30.8	-22 11.7	116 4.7	11 39.3
2	327 42.5	144	- 9 5.0	141	11 36.3	-22 11.8	146 9.3	11 39.1
4	356 49.2	144	- 8 36.7	142	41 41.9	-22 11.8	176 13.8	11 39.0
6	25 56.1	144	- 8 8.3	143	71 47.4	-22 11.9	206 18.4	11 38.8
8	55 2.9	144	- 7 39.6	144	101 53.0	-22 12.0	236 22.9	11 38.7
10	84 9.8	144	- 7 10.8	145	131 58.6	-22 12.1	266 27.5	11 38.5
12	113 16.7	145	- 6 41.8	146	162 4.1	-22 12.2	296 32.0	11 38.3
14	142 23.6	145	- 6 12.6	147	192 9.7	-22 12.3	326 36.5	11 38.2
16	171 30.5	145	- 5 43.3	147	222 15.2	-22 12.4	356 41.1	11 38.0
18	200 37.4	144	- 5 13.8	148	252 20.8	-22 12.5	26 45.6	11 37.9
20	229 44.3	144	- 4 44.2	149	282 26.4	-22 12.6	56 50.2	11 37.7
22	258 51.2	144	- 4 14.4	149	312 31.9	-22 12.7	86 54.7	11 37.6
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 28	1 45	: ::	23 14	.0	9 30	3.7
55	3 22	20 43	0 58	: ::	23 10	.3	9 40	3.4
50	3 52	20 13	0 45	: ::	23 6	.6	9 48	3.1
45	4 14	19 51	0 37	2 33	23 3	.8	9 53	2.9
40	4 32	19 33	0 33	2 3	23 0	1.0	9 58	2.7
35	4 47	19 18	0 30	1 47	22 58	1.1	10 3	2.6
30	5 0	19 5	0 27	1 37	22 56	1.2	10 6	2.4
20	5 22	18 43	0 25	1 24	22 52	1.5	10 13	2.2
10	5 41	18 24	0 23	1 18	22 49	1.7	10 18	2.0
0	5 59	18 6	0 23	1 15	22 46	1.8	10 24	1.8
10	6 16	17 49	0 23	1 15	22 43	2.0	10 29	1.6
20	6 35	17 30	0 24	1 19	22 40	2.2	10 34	1.4
30	6 56	17 9	0 26	1 26	22 37	2.5	10 40	1.2
35	7 8	16 57	0 28	1 31	22 35	2.6	10 44	1.1
40	7 23	16 42	0 31	1 38	22 32	2.8	10 48	.9
45	7 39	16 26	0 34	1 47	22 29	2.9	10 52	.8
50	8 0	16 5	0 38	1 60	22 26	3.2	10 58	.6
55	8 27	15 38	0 46	2 18	22 22	3.4	11 4	.3
60	9 6	14 59	0 58	2 46	22 16	3.8	11 13	.0
S								

SUNCE UT	SUNCE e = Tp − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′		h min	min	′	′
00	− 2 25.1	-.5	15.8	$T_{\overline{m}}$	4 13	1.8	56.3	15.3
12	− 2 31.4	$T_{\overline{m}_\odot}$ 12 h 2.5 min		Starost 20.2 d	Faza ◑			

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 21	.1	262	-3.8	♃	1 14	.0	69	-2.5
♂	15 41	.1	212	1.6	♄	16 13	.0	204	.7

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 20.5	23 23.1	273 30.0	174 35.5	23 50.5	124 47.5	13 58.3
2	209 20.2	23 23.0	303 34.9	204 33.7	23 50.3	154 49.6	13 57.2
4	239 20.0	23 22.8	333 39.8	234 31.9	23 50.1	184 51.7	13 56.2
6	269 19.7	23 22.7	3 44.7	264 30.1	23 49.9	214 53.8	13 55.1
8	299 19.4	23 22.5	33 49.7	294 28.3	23 49.7	244 55.9	13 54.0
10	329 19.2	23 22.4	63 54.6	324 26.6	23 49.4	274 58.0	13 53.0
12	359 18.9	23 22.2	93 59.5	354 24.8	23 49.2	305 .1	13 51.9
14	29 18.7	23 22.1	124 4.4	24 23.0	23 49.0	335 2.2	13 50.9
16	59 18.4	23 21.9	154 9.4	54 21.2	23 48.7	5 4.3	13 49.8
18	89 18.1	23 21.8	184 14.3	84 19.4	23 48.5	35 6.4	13 48.8
20	119 17.9	23 21.6	214 19.2	114 17.6	23 48.2	65 8.5	13 47.7
22	149 17.6	23 21.4	244 24.2	144 15.9	23 48.0	95 10.6	13 46.7
Δ	-1	-1		-9	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	287 58.0	144	- 3 44.5	150	342 37.5	-22 12.8	116 59.3	11 37.4
2	317 4.8	144	- 3 14.5	151	12 43.0	-22 12.9	147 3.8	11 37.3
4	346 11.5	143	- 2 44.4	151	42 48.6	-22 13.0	177 8.3	11 37.1
6	15 18.1	143	- 2 14.1	152	72 54.2	-22 13.1	207 12.9	11 36.9
8	44 24.7	142	- 1 43.8	152	102 59.7	-22 13.2	237 17.4	11 36.8
10	73 31.2	142	- 1 13.4	153	133 5.3	-22 13.3	267 21.9	11 36.6
12	102 37.6	141	- 0 42.8	153	163 10.9	-22 13.4	297 26.5	11 36.5
14	131 43.9	141	- 0 12.2	153	193 16.4	-22 13.5	327 31.0	11 36.3
16	160 50.0	140	0 18.4	154	223 22.0	-22 13.6	357 35.6	11 36.1
18	189 56.1	139	0 49.1	154	253 27.6	-22 13.7	27 40.1	11 36.0
20	219 2.0	139	1 19.9	154	283 33.1	-22 13.8	57 44.6	11 35.8
22	248 7.7	138	1 50.7	154	313 38.7	-22 13.9	87 49.2	11 35.7
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 37	21 28	1 44	: ::	23 15	.0	11 0	3.8
55	3 22	20 43	0 58	: ::	23 18	.4	11 1	3.5
50	3 52	20 13	0 45	: ::	23 20	.6	11 2	3.2
45	4 14	19 51	0 37	2 33	23 22	.8	11 3	3.0
40	4 32	19 33	0 33	2 3	23 23	1.0	11 4	2.8
35	4 48	19 18	0 30	1 47	23 24	1.2	11 5	2.6
30	5 1	19 5	0 27	1 36	23 25	1.3	11 5	2.5
20	5 23	18 43	0 25	1 24	23 27	1.5	11 6	2.3
10	5 41	18 24	0 23	1 18	23 29	1.7	11 7	2.1
0	5 59	18 6	0 23	1 15	23 31	1.9	11 7	1.9
10	6 16	17 49	0 23	1 15	23 32	2.1	11 8	1.7
20	6 35	17 31	0 24	1 19	23 34	2.3	11 9	1.5
30	6 56	17 9	0 26	1 25	23 36	2.6	11 10	1.2
35	7 9	16 57	0 28	1 31	23 37	2.7	11 10	1.1
40	7 23	16 43	0 31	1 38	23 39	2.9	11 10	1.0
45	7 39	16 26	0 34	1 47	23 40	3.1	11 11	.8
50	8 0	16 5	0 38	1 59	23 42	3.3	11 12	.6
55	8 27	15 38	0 46	2 18	23 44	3.6	11 12	.3
60	9 6	14 60	0 58	2 46	23 47	3.9	11 13	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 2 37.8	-.5	15.8	$T_{\overline{m}}$ 4 57	1.9	56.9	15.5
12	- 2 44.1	$T_{\overline{m}_\odot}$ 12 h	2.7 min	Starost 21.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 22	.1	261	-3.8	♃	1 9	.0	69	-2.5
♂	15 40	.1	211	1.6	♄	16 10	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 17.3	23 21.3	274 29.1	174 14.1	23 47.7	125 12.7	13 45.6
2	209 17.1	23 21.1	304 34.0	204 12.3	23 47.5	155 14.8	13 44.5
4	239 16.8	23 20.9	334 38.9	234 10.5	23 47.2	185 16.9	13 43.5
6	269 16.6	23 20.7	4 43.9	264 8.7	23 46.9	215 19.0	13 42.4
8	299 16.3	23 20.5	34 48.8	294 6.9	23 46.7	245 21.1	13 41.4
10	329 16.0	23 20.4	64 53.7	324 5.2	23 46.4	275 23.2	13 40.3
12	359 15.8	23 20.2	94 58.7	354 3.4	23 46.1	305 25.3	13 39.2
14	29 15.5	23 20.0	125 3.6	24 1.6	23 45.8	335 27.4	13 38.2
16	59 15.2	23 19.8	155 8.5	53 59.8	23 45.5	5 29.5	13 37.1
18	89 15.0	23 19.6	185 13.4	83 58.0	23 45.2	35 31.6	13 36.0
20	119 14.7	23 19.4	215 18.4	113 56.3	23 44.9	65 33.7	13 35.0
22	149 14.5	23 19.2	245 23.3	143 54.5	23 44.6	95 35.8	13 33.9
Δ	-1	-1		-9	-1	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	277 13.3	137	2 21.6	154	343 44.3	-22 14.0	117 53.7	11 35.5
2	306 18.7	136	2 52.4	154	13 49.8	-22 14.1	147 58.2	11 35.4
4	335 23.9	135	3 23.3	154	43 55.4	-22 14.2	178 2.8	11 35.2
6	4 29.0	134	3 54.2	154	74 1.0	-22 14.3	208 7.3	11 35.0
8	33 33.8	133	4 25.1	154	104 6.6	-22 14.4	238 11.8	11 34.9
10	62 38.4	132	4 55.9	154	134 12.1	-22 14.5	268 16.4	11 34.7
12	91 42.8	131	5 26.8	154	164 17.7	-22 14.6	298 20.9	11 34.6
14	120 47.0	130	5 57.6	154	194 23.3	-22 14.7	328 25.4	11 34.4
16	149 50.9	128	6 28.4	154	224 28.9	-22 14.8	358 29.9	11 34.2
18	178 54.5	127	6 59.1	153	254 34.4	-22 14.9	28 34.5	11 34.1
20	207 57.9	125	7 29.8	153	284 40.0	-22 15.0	58 39.0	11 33.9
22	237 1.0	124	8 .3	152	314 45.6	-22 15.0	88 43.5	11 33.8
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 38	21 27	1 43	: ::	23 16	.1	12 32	4.0
55	3 22	20 43	0 58	: ::	23 27	.5	12 25	3.6
50	3 52	20 13	0 44	: ::	23 35	.7	12 19	3.3
45	4 15	19 51	0 37	2 32	23 42	.9	12 15	3.1
40	4 33	19 33	0 33	2 3	23 47	1.1	12 11	2.9
35	4 48	19 18	0 30	1 47	23 52	1.3	12 8	2.8
30	5 1	19 5	0 27	1 36	23 56	1.4	12 5	2.6
20	5 23	18 43	0 25	1 24	. . .	.0	12 1	2.4
10	5 42	18 24	0 23	1 18	. . .	.0	11 56	2.2
0	5 59	18 7	0 23	1 15	. . .	.0	11 52	2.0
10	6 17	17 49	0 23	1 15	. . .	.0	11 48	1.8
20	6 35	17 31	0 24	1 19	. . .	.0	11 44	1.6
30	6 56	17 10	0 26	1 25	. . .	.0	11 39	1.3
35	7 9	16 57	0 28	1 31	. . .	.0	11 37	1.2
40	7 23	16 43	0 31	1 38	. . .	.0	11 34	1.1
45	7 40	16 26	0 34	1 47	. . .	.0	11 30	.9
50	8 0	16 6	0 38	1 59	. . .	.0	11 26	.7
55	8 27	15 39	0 45	2 18	. . .	.0	11 21	.4
60	9 6	15 0	0 58	2 46	. . .	.0	11 14	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 2 50.5	-.5	15.8	$T_{\overline{m}}$ 5 42	1.9	57.6	15.7
12	- 2 56.7	$T_{\overline{m}_\odot}$ 12 h	2.9 min	Starost 22.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 24	.1	260	-3.8	♃	1 5	.0	69	-2.6
♂	15 38	.1	211	1.6	♄	16 6	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 14.2	23 19.0	275 28.2	173 52.7	23 44.3	125 37.9	13 32.8
2	209 14.0	23 18.8	305 33.2	203 50.9	23 43.9	155 40.0	13 31.8
4	239 13.7	23 18.6	335 38.1	233 49.2	23 43.6	185 42.0	13 30.7
6	269 13.4	23 18.4	5 43.0	263 47.4	23 43.3	215 44.1	13 29.6
8	299 13.2	23 18.1	35 47.9	293 45.6	23 43.0	245 46.2	13 28.6
10	329 12.9	23 17.9	65 52.9	323 43.8	23 42.6	275 48.3	13 27.5
12	359 12.7	23 17.7	95 57.8	353 42.1	23 42.3	305 50.4	13 26.4
14	29 12.4	23 17.5	126 2.7	23 40.3	23 41.9	335 52.5	13 25.4
16	59 12.1	23 17.2	156 7.7	53 38.5	23 41.6	5 54.6	13 24.3
18	89 11.9	23 17.0	186 12.6	83 36.7	23 41.2	35 56.7	13 23.2
20	119 11.6	23 16.8	216 17.5	113 35.0	23 40.8	65 58.8	13 22.1
22	149 11.4	23 16.5	246 22.4	143 33.2	23 40.5	96 .9	13 21.1
Δ	-1	-1		-9	-2	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	266 3.8	122	8 30.8	152	344 51.2	-22 15.1	118 48.1	11 33.6
2	295 6.3	121	9 1.2	151	14 56.7	-22 15.2	148 52.6	11 33.4
4	324 8.4	119	9 31.5	151	45 2.3	-22 15.3	178 57.1	11 33.3
6	353 10.3	117	10 1.7	150	75 7.9	-22 15.4	209 1.6	11 33.1
8	22 11.8	116	10 31.8	149	105 13.5	-22 15.5	239 6.2	11 32.9
10	51 12.9	114	11 1.7	149	135 19.0	-22 15.6	269 10.7	11 32.8
12	80 13.7	112	11 31.4	148	165 24.6	-22 15.7	299 15.2	11 32.6
14	109 14.1	110	12 1.0	147	195 30.2	-22 15.8	329 19.8	11 32.5
16	138 14.1	108	12 30.4	146	225 35.8	-22 15.9	359 24.3	11 32.3
18	167 13.8	106	12 59.6	145	255 41.4	-22 16.0	29 28.8	11 32.1
20	196 13.0	104	13 28.5	144	285 46.9	-22 16.1	59 33.3	11 32.0
22	225 11.9	102	13 57.3	143	315 52.5	-22 16.2	89 37.8	11 31.8
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 39	21 27	1 42	: ::	23 18	.2	14 9	4.3
55	3 23	20 43	0 58	: ::	23 37	.6	13 52	3.9
50	3 53	20 13	0 44	: ::	23 52	.9	13 40	3.5
45	4 15	19 51	0 37	2 32	. . .	.0	13 30	3.3
40	4 33	19 33	0 33	2 3	. . .	.0	13 22	3.1
35	4 48	19 18	0 30	1 47	. . .	.0	13 15	2.9
30	5 1	19 5	0 27	1 36	. . .	.0	13 8	2.8
20	5 23	18 43	0 25	1 24	0 4	1.7	12 58	2.5
10	5 42	18 24	0 23	1 18	0 11	1.9	12 48	2.3
0	5 59	18 7	0 23	1 15	0 17	2.1	12 40	2.1
10	6 17	17 49	0 23	1 15	0 23	2.3	12 31	2.0
20	6 35	17 31	0 24	1 19	0 30	2.5	12 22	1.7
30	6 56	17 10	0 26	1 25	0 38	2.7	12 12	1.5
35	7 9	16 58	0 28	1 31	0 42	2.8	12 6	1.4
40	7 23	16 44	0 31	1 38	0 48	3.0	11 59	1.2
45	7 40	16 27	0 34	1 47	0 54	3.2	11 51	1.0
50	8 0	16 6	0 38	1 59	1 1	3.4	11 42	.8
55	8 27	15 39	0 45	2 17	1 11	3.8	11 30	.5
60	9 5	15 1	0 57	2 46	1 23	4.2	11 15	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 3 3.0	-.5	15.8	$T_{\overline{m}}$	6 28	2.1	58.4	15.9
12	- 3 9.2	$T_{\overline{m}_\odot}$	12 h 3.2 min	Starost 23.2 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 25	.1	258	-3.8	♃	1 0	.0	69	-2.6
♂	15 36	.1	210	1.6	♄	16 2	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 11.1	23 16.3	276 27.4	173 31.4	23 40.1	126 3.0	13 20.0
2	209 10.9	23 16.1	306 32.3	203 29.7	23 39.7	156 5.1	13 18.9
4	239 10.6	23 15.8	336 37.2	233 27.9	23 39.3	186 7.2	13 17.8
6	269 10.4	23 15.6	6 42.2	263 26.1	23 38.9	216 9.3	13 16.8
8	299 10.1	23 15.3	36 47.1	293 24.4	23 38.5	246 11.4	13 15.7
10	329 9.8	23 15.1	66 52.0	323 22.6	23 38.1	276 13.5	13 14.6
12	359 9.6	23 14.8	96 56.9	353 20.8	23 37.7	306 15.6	13 13.5
14	29 9.3	23 14.6	127 1.9	23 19.1	23 37.3	336 17.7	13 12.5
16	59 9.1	23 14.3	157 6.8	53 17.3	23 36.9	6 19.8	13 11.4
18	89 8.8	23 14.0	187 11.7	83 15.5	23 36.5	36 21.9	13 10.3
20	119 8.6	23 13.8	217 16.6	113 13.8	23 36.1	66 24.0	13 9.2
22	149 8.3	23 13.5	247 21.6	143 12.0	23 35.7	96 26.1	13 8.1
Δ	-1	-1		-9	-2	10	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	254 10.3	100	14 25.8	141	345 58.1	-22 16.3	119 42.4	11 31.6
2	283 8.2	98	14 54.1	140	16 3.7	-22 16.4	149 46.9	11 31.5
4	312 5.8	95	15 22.1	139	46 9.3	-22 16.5	179 51.4	11 31.3
6	341 2.8	93	15 49.9	137	76 14.9	-22 16.6	209 55.9	11 31.1
8	9 59.5	91	16 17.3	136	106 20.4	-22 16.7	240 .5	11 31.0
10	38 55.6	88	16 44.4	134	136 26.0	-22 16.8	270 5.0	11 30.8
12	67 51.3	86	17 11.3	132	166 31.6	-22 16.9	300 9.5	11 30.7
14	96 46.5	84	17 37.7	131	196 37.2	-22 17.0	330 14.0	11 30.5
16	125 41.2	81	18 3.8	129	226 42.8	-22 17.1	0 18.5	11 30.3
18	154 35.4	79	18 29.6	127	256 48.4	-22 17.2	30 23.1	11 30.2
20	183 29.1	76	18 54.9	125	286 53.9	-22 17.3	60 27.6	11 30.0
22	212 22.4	74	19 19.9	123	316 59.5	-22 17.4	90 32.1	11 29.8
Δ					28	0	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 27	1 41	: ::	23 22	.4	15 53	4.6
55	3 24	20 43	0 58	: ::	23 52	.9	15 25	4.0
50	3 53	20 13	0 44	: ::	. . .	.0	15 4	3.7
45	4 16	19 51	0 37	2 32	0 5	1.2	14 49	3.4
40	4 34	19 33	0 33	2 3	0 15	1.3	14 36	3.2
35	4 49	19 18	0 30	1 47	0 23	1.5	14 25	3.1
30	5 1	19 5	0 27	1 36	0 31	1.6	14 15	2.9
20	5 23	18 43	0 25	1 24	0 44	1.9	13 59	2.7
10	5 42	18 24	0 23	1 18	0 55	2.1	13 44	2.5
0	5 60	18 7	0 23	1 15	1 6	2.2	13 31	2.4
10	6 17	17 50	0 23	1 15	1 17	2.4	13 18	2.2
20	6 35	17 31	0 24	1 19	1 29	2.6	13 4	2.0
30	6 56	17 10	0 26	1 25	1 43	2.9	12 48	1.8
35	7 9	16 58	0 28	1 31	1 51	3.0	12 39	1.6
40	7 23	16 44	0 31	1 38	2 0	3.2	12 28	1.5
45	7 39	16 27	0 34	1 47	2 11	3.4	12 16	1.3
50	8 0	16 7	0 38	1 59	2 24	3.6	12 1	1.1
55	8 27	15 40	0 45	2 17	2 41	4.0	11 42	.7
60	9 5	15 2	0 57	2 45	3 4	4.5	11 17	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 3 15.3	-.5	15.8	$T_{\overline{m}}$	7 19	2.3	59.2	16.1
12	- 3 21.5	$T_{\overline{m}_\odot}$	12 h 3.4 min	Starost 24.2 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 27	.1	257	-3.8	♃	0 56	.0	70	-2.6
♂	15 35	.1	210	1.6	♄	15 59	.0	203	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 8.1	23 13.2	277 26.5	173 10.2	23 35.2	126 28.2	13 7.1
2	209 7.8	23 13.0	307 31.4	203 8.5	23 34.8	156 30.3	13 6.0
4	239 7.6	23 12.7	337 36.4	233 6.7	23 34.3	186 32.4	13 4.9
6	269 7.3	23 12.4	7 41.3	263 5.0	23 33.9	216 34.5	13 3.8
8	299 7.1	23 12.1	37 46.2	293 3.2	23 33.4	246 36.6	13 2.7
10	329 6.8	23 11.8	67 51.1	323 1.4	23 33.0	276 38.7	13 1.7
12	359 6.6	23 11.5	97 56.1	352 59.7	23 32.5	306 40.8	13 .6
14	29 6.3	23 11.2	128 1.0	22 57.9	23 32.1	336 42.9	12 59.5
16	59 6.1	23 10.9	158 5.9	52 56.2	23 31.6	6 44.9	12 58.4
18	89 5.8	23 10.6	188 10.9	82 54.4	23 31.1	36 47.0	12 57.3
20	119 5.6	23 10.3	218 15.8	112 52.7	23 30.6	66 49.1	12 56.2
22	149 5.3	23 10.0	248 20.7	142 50.9	23 30.1	96 51.2	12 55.1
Δ	-1	-1		-9	-2	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{h}	SATURN δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	241 15.1	71	19 44.4	120	347 5.1	-22 17.5	120 36.6	11 29.7
2	270 7.3	68	20 8.5	118	17 10.7	-22 17.6	150 41.1	11 29.5
4	298 59.0	66	20 32.1	116	47 16.3	-22 17.7	180 45.6	11 29.3
6	327 50.1	63	20 55.3	113	77 21.9	-22 17.8	210 50.2	11 29.2
8	356 40.8	61	21 17.9	111	107 27.5	-22 17.9	240 54.7	11 29.0
10	25 30.9	58	21 40.1	108	137 33.1	-22 18.0	270 59.2	11 28.8
12	54 20.5	56	22 1.7	106	167 38.7	-22 18.1	301 3.7	11 28.7
14	83 9.7	53	22 22.8	103	197 44.3	-22 18.2	331 8.2	11 28.5
16	111 58.3	50	22 43.4	100	227 49.8	-22 18.3	1 12.7	11 28.3
18	140 46.4	48	23 3.3	97	257 55.4	-22 18.4	31 17.2	11 28.2
20	169 33.9	45	23 22.7	94	288 1.0	-22 18.5	61 21.8	11 28.0
22	198 21.0	43	23 41.5	91	318 6.6	-22 18.6	91 26.3	11 27.8
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 40	21 26	1 40	: ::	23 31	.9	17 43	4.6
55	3 24	20 42	0 57	: ::	.. ..	.0	17 1	3.9
50	3 54	20 13	0 44	: ::	0 15	1.3	16 32	3.6
45	4 16	19 51	0 37	2 31	0 33	1.5	16 11	3.4
40	4 34	19 33	0 33	2 2	0 47	1.7	15 53	3.2
35	4 49	19 18	0 30	1 47	0 59	1.8	15 38	3.1
30	5 2	19 5	0 27	1 36	1 10	1.9	15 26	3.0
20	5 24	18 43	0 25	1 24	1 29	2.1	15 4	2.9
10	5 42	18 25	0 23	1 18	1 45	2.3	14 45	2.7
0	5 60	18 7	0 22	1 15	2 0	2.5	14 28	2.6
10	6 17	17 50	0 23	1 15	2 16	2.6	14 10	2.4
20	6 36	17 32	0 24	1 19	2 32	2.8	13 52	2.3
30	6 57	17 11	0 26	1 25	2 52	3.0	13 31	2.1
35	7 9	16 58	0 28	1 31	3 3	3.1	13 18	2.0
40	7 23	16 44	0 30	1 37	3 16	3.3	13 4	1.9
45	7 39	16 28	0 34	1 47	3 32	3.4	12 47	1.7
50	7 60	16 7	0 38	1 59	3 51	3.7	12 27	1.5
55	8 27	15 41	0 45	2 17	4 16	4.0	11 60	1.2
60	9 5	15 3	0 57	2 45	4 52	4.7	11 23	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 3 27.5	-.5	15.8	$T_{\overline{m}}$ 8 14	2.5	59.9	16.3
12	- 3 33.6	$T_{\overline{m}_\odot}$ 12 h 3.6 min		Starost 25.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 28	.1	256	-3.8	♃	0 51	.0	70	-2.6
♂	15 33	.1	209	1.6	♄	15 55	.0	203	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 5.1	23 9.7	278 25.6	172 49.1	23 29.6	126 53.3	12 54.1
2	209 4.8	23 9.4	308 30.6	202 47.4	23 29.1	156 55.4	12 53.0
4	239 4.6	23 9.1	338 35.5	232 45.6	23 28.6	186 57.5	12 51.9
6	269 4.3	23 8.8	8 40.4	262 43.9	23 28.1	216 59.6	12 50.8
8	299 4.1	23 8.5	38 45.4	292 42.1	23 27.6	247 1.7	12 49.7
10	329 3.8	23 8.2	68 50.3	322 40.4	23 27.1	277 3.8	12 48.6
12	359 3.6	23 7.8	98 55.2	352 38.6	23 26.6	307 5.9	12 47.5
14	29 3.3	23 7.5	129 .1	22 36.9	23 26.1	337 8.0	12 46.4
16	59 3.1	23 7.2	159 5.1	52 35.1	23 25.5	7 10.1	12 45.3
18	89 2.8	23 6.8	189 10.0	82 33.4	23 25.0	37 12.2	12 44.2
20	119 2.6	23 6.5	219 14.9	112 31.7	23 24.5	67 14.3	12 43.1
22	149 2.4	23 6.2	249 19.9	142 29.9	23 23.9	97 16.4	12 42.0
Δ	-1	-2		-9	-3	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{h}	SATURN δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	227 7.6	41	23 59.6	88	348 12.2	-22 18.7	121 30.8	11 27.7
2	255 53.8	38	24 17.1	84	18 17.8	-22 18.8	151 35.3	11 27.5
4	284 39.4	36	24 34.0	81	48 23.4	-22 18.9	181 39.8	11 27.3
6	313 24.6	34	24 50.1	77	78 29.0	-22 19.0	211 44.3	11 27.2
8	342 9.4	32	25 5.6	74	108 34.6	-22 19.1	241 48.8	11 27.0
10	10 53.7	29	25 20.4	70	138 40.2	-22 19.1	271 53.3	11 26.8
12	39 37.6	27	25 34.5	67	168 45.8	-22 19.2	301 57.8	11 26.7
14	68 21.0	25	25 47.8	63	198 51.4	-22 19.3	332 2.4	11 26.5
16	97 4.1	24	26 .4	59	228 57.0	-22 19.4	2 6.9	11 26.3
18	125 46.9	22	26 12.2	55	259 2.6	-22 19.5	32 11.4	11 26.1
20	154 29.2	20	26 23.2	51	289 8.2	-22 19.6	62 15.9	11 26.0
22	183 11.3	19	26 33.5	47	319 13.8	-22 19.7	92 20.4	11 25.8
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 41	21 25	1 39	: ::	23 52	2.1	19 34	3.7
55	3 25	20 42	0 57	: ::	0 16	1.5	18 36	3.3
50	3 55	20 13	0 44	: ::	0 46	1.8	17 59	3.2
45	4 17	19 51	0 37	2 31	1 9	2.0	17 32	3.1
40	4 35	19 33	0 33	2 2	1 28	2.1	17 11	3.0
35	4 49	19 18	0 30	1 46	1 43	2.2	16 53	3.0
30	5 2	19 5	0 27	1 36	1 57	2.3	16 38	2.9
20	5 24	18 43	0 24	1 24	2 20	2.5	16 12	2.9
10	5 43	18 25	0 23	1 17	2 40	2.6	15 50	2.8
0	6 0	18 7	0 22	1 15	2 60	2.7	15 30	2.7
10	6 17	17 50	0 23	1 15	3 19	2.8	15 9	2.7
20	6 36	17 32	0 24	1 19	3 40	2.9	14 47	2.6
30	6 57	17 11	0 26	1 25	4 4	3.0	14 22	2.5
35	7 9	16 59	0 28	1 31	4 18	3.1	14 7	2.5
40	7 23	16 45	0 30	1 37	4 34	3.2	13 49	2.4
45	7 39	16 28	0 34	1 47	4 54	3.3	13 29	2.3
50	7 60	16 8	0 38	1 59	5 19	3.5	13 3	2.2
55	8 26	15 41	0 45	2 17	5 53	3.7	12 28	1.9
60	9 4	15 4	0 57	2 45	6 46	4.4	11 35	1.3
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 3 39.6	-.5	15.8	$T_{\overline{m}}$ 9 15	2.7	60.5	16.5
12	- 3 45.5	$T_{\overline{m}_\odot}$ 12 h 3.8 min		Starost 26.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 29	.1	254	-3.8	♃	0 47	.0	70	-2.6
♂	15 31	.1	208	1.6	♄	15 52	.0	203	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 2.1	23 5.8	279 24.8	172 28.2	23 23.4	127 18.5	12 41.0
2	209 1.9	23 5.5	309 29.7	202 26.4	23 22.8	157 20.6	12 39.9
4	239 1.6	23 5.1	339 34.6	232 24.7	23 22.3	187 22.7	12 38.8
6	269 1.4	23 4.8	9 39.6	262 22.9	23 21.7	217 24.8	12 37.7
8	299 1.1	23 4.4	39 44.5	292 21.2	23 21.1	247 26.9	12 36.6
10	329 .9	23 4.1	69 49.4	322 19.5	23 20.6	277 29.0	12 35.5
12	359 .7	23 3.7	99 54.4	352 17.7	23 20.0	307 31.1	12 34.4
14	29 .4	23 3.4	129 59.3	22 16.0	23 19.4	337 33.2	12 33.3
16	59 .2	23 3.0	160 4.2	52 14.3	23 18.8	7 35.3	12 32.2
18	88 59.9	23 2.6	190 9.1	82 12.5	23 18.2	37 37.4	12 31.1
20	118 59.7	23 2.3	220 14.1	112 10.8	23 17.6	67 39.5	12 30.0
22	148 59.5	23 1.9	250 19.0	142 9.1	23 17.0	97 41.6	12 28.9
Δ	-1	-2		-9	-3	10	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	211 53.0	17	26 43.0	43	349 19.4	-22 19.8	122 24.9	11 25.6
2	240 34.4	16	26 51.7	39	19 25.0	-22 19.9	152 29.4	11 25.5
4	269 15.6	15	26 59.5	35	49 30.6	-22 20.0	182 33.9	11 25.3
6	297 56.5	14	27 6.5	31	79 36.2	-22 20.1	212 38.4	11 25.1
8	326 37.2	13	27 12.7	27	109 41.8	-22 20.2	242 42.9	11 25.0
10	355 17.7	12	27 18.1	23	139 47.4	-22 20.3	272 47.4	11 24.8
12	23 58.1	11	27 22.6	18	169 52.9	-22 20.4	302 51.9	11 24.6
14	52 38.3	11	27 26.3	14	199 58.5	-22 20.5	332 56.4	11 24.4
16	81 18.4	10	27 29.1	10	230 4.2	-22 20.6	3 .9	11 24.3
18	109 58.4	10	27 31.0	5	260 9.8	-22 20.7	33 5.4	11 24.1
20	138 38.4	10	27 32.1	1	290 15.4	-22 20.8	63 9.9	11 23.9
22	167 18.3	10	27 32.3	-3	320 21.0	-22 20.9	93 14.4	11 23.8
Δ					28	0	23	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 42	21 25	1 37	: ::	.. ..	.0	21 3	1.9
55	3 26	20 42	0 57	: ::	0 52	2.4	19 56	2.3
50	3 55	20 12	0 44	: ::	1 30	2.6	19 16	2.5
45	4 17	19 50	0 37	2 30	1 57	2.6	18 47	2.6
40	4 35	19 33	0 33	2 2	2 19	2.7	18 24	2.6
35	4 50	19 18	0 30	1 46	2 37	2.7	18 5	2.6
30	5 3	19 5	0 27	1 36	2 53	2.7	17 49	2.7
20	5 24	18 44	0 24	1 24	3 19	2.7	17 21	2.7
10	5 43	18 25	0 23	1 17	3 42	2.8	16 58	2.8
0	6 0	18 8	0 22	1 15	4 4	2.8	16 36	2.8
10	6 17	17 50	0 23	1 15	4 25	2.8	16 14	2.8
20	6 36	17 32	0 24	1 18	4 49	2.8	15 50	2.8
30	6 57	17 11	0 26	1 25	5 16	2.8	15 22	2.9
35	7 9	16 59	0 28	1 30	5 32	2.8	15 6	2.9
40	7 23	16 45	0 30	1 37	5 51	2.8	14 47	2.9
45	7 39	16 29	0 34	1 46	6 13	2.8	14 24	2.9
50	7 59	16 9	0 38	1 59	6 42	2.9	13 55	2.9
55	8 26	15 42	0 45	2 17	7 23	2.9	13 14	3.0
60	9 4	15 4	0 57	2 45	8 31	2.8	12 6	3.0
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 3 51.3	-.5	15.8	$T_{\overline{m}}$ 10 20	2.8	60.9	16.6
12	- 3 57.1	$T_{\overline{m}_\odot}$ 12 h 4.0 min		Starost 27.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 31	.1	253	-3.8	♃	0 43	.0	70	-2.6
♂	15 30	.1	208	1.6	♄	15 48	.0	203	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 59.2	23 1.5	280 23.9	172 7.3	23 16.4	127 43.7	12 27.8
2	208 59.0	23 1.2	310 28.9	202 5.6	23 15.8	157 45.8	12 26.7
4	238 58.8	23 .8	340 33.8	232 3.9	23 15.2	187 47.9	12 25.6
6	268 58.5	23 .4	10 38.7	262 2.1	23 14.6	217 50.0	12 24.5
8	298 58.3	23 .0	40 43.6	292 .4	23 13.9	247 52.1	12 23.4
10	328 58.0	22 59.6	70 48.6	321 58.7	23 13.3	277 54.2	12 22.2
12	358 57.8	22 59.2	100 53.5	351 57.0	23 12.7	307 56.2	12 21.1
14	28 57.6	22 58.8	130 58.4	21 55.2	23 12.0	337 58.3	12 20.0
16	58 57.3	22 58.4	161 3.3	51 53.5	23 11.4	8 .4	12 18.9
18	88 57.1	22 58.0	191 8.3	81 51.8	23 10.7	38 2.5	12 17.8
20	118 56.9	22 57.6	221 13.2	111 50.1	23 10.1	68 4.6	12 16.7
22	148 56.6	22 57.2	251 18.1	141 48.4	23 9.4	98 6.7	12 15.6
Δ	-1	-2		-9	-3	10	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	195 58.2	10	27 31.7	-7	350 26.6	-22 21.0	123 18.9	11 23.6
2	224 38.2	10	27 30.2	-12	20 32.2	-22 21.1	153 23.4	11 23.4
4	253 18.2	11	27 27.9	-16	50 37.8	-22 21.2	183 27.9	11 23.2
6	281 58.3	11	27 24.6	-20	80 43.4	-22 21.3	213 32.4	11 23.1
8	310 38.6	12	27 20.6	-25	110 49.0	-22 21.4	243 36.9	11 22.9
10	339 18.9	13	27 15.6	-29	140 54.6	-22 21.5	273 41.4	11 22.7
12	7 59.4	14	27 9.9	-33	171 .2	-22 21.6	303 45.9	11 22.6
14	36 40.2	15	27 3.3	-37	201 5.8	-22 21.7	333 50.4	11 22.4
16	65 21.1	16	26 55.8	-41	231 11.4	-22 21.8	3 54.9	11 22.2
18	94 2.3	17	26 47.6	-45	261 17.0	-22 21.9	33 59.4	11 22.0
20	122 43.7	19	26 38.5	-49	291 22.6	-22 22.0	64 3.9	11 21.9
22	151 25.5	20	26 28.6	-53	321 28.2	-22 22.1	94 8.4	11 21.7
Δ					28	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 44	21 24	1 36	: ::	0 44	3.9	21 49	.8
55	3 27	20 41	0 57	: ::	1 51	3.4	20 52	1.4
50	3 56	20 12	0 44	: ::	2 31	3.3	20 15	1.8
45	4 18	19 50	0 37	2 30	3 0	3.2	19 48	2.0
40	4 35	19 33	0 33	2 2	3 23	3.1	19 26	2.1
35	4 50	19 18	0 30	1 46	3 42	3.0	19 8	2.2
30	5 3	19 5	0 27	1 36	3 58	3.0	18 53	2.3
20	5 25	18 44	0 24	1 24	4 25	2.9	18 26	2.4
10	5 43	18 25	0 23	1 17	4 49	2.8	18 4	2.6
0	6 0	18 8	0 22	1 15	5 11	2.7	17 42	2.7
10	6 18	17 51	0 23	1 15	5 33	2.7	17 21	2.8
20	6 36	17 33	0 24	1 18	5 56	2.6	16 58	2.9
30	6 57	17 12	0 26	1 25	6 24	2.5	16 31	3.0
35	7 9	16 60	0 28	1 30	6 40	2.4	16 15	3.1
40	7 23	16 46	0 30	1 37	6 59	2.3	15 56	3.2
45	7 39	16 29	0 34	1 46	7 22	2.2	15 34	3.3
50	7 59	16 9	0 38	1 59	7 51	2.1	15 5	3.5
55	8 26	15 43	0 45	2 17	8 31	1.8	14 25	3.8
60	9 3	15 6	0 57	2 44	9 38	1.2	13 19	4.5
S								

SUNCE UT	SUNCE e = T_p − UT	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 4 2.9	-.5	15.8	$T_{\overline{m}}$ 11 27	2.7	61.0	16.6
12	- 4 8.5	$T_{\overline{m}_\odot}$ 12 h 4.1 min		Starost 28.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 32	.1	252	-3.8	♃	0 38	.0	70	-2.6
♂	15 28	.1	207	1.6	♄	15 44	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 56.4	22 56.8	281 23.1	171 46.6	23 8.8	128 8.8	12 14.5
2	208 56.2	22 56.4	311 28.0	201 44.9	23 8.1	158 10.9	12 13.4
4	238 56.0	22 56.0	341 32.9	231 43.2	23 7.4	188 13.0	12 12.3
6	268 55.7	22 55.6	11 37.8	261 41.5	23 6.7	218 15.1	12 11.2
8	298 55.5	22 55.2	41 42.8	291 39.8	23 6.1	248 17.2	12 10.1
10	328 55.3	22 54.7	71 47.7	321 38.1	23 5.4	278 19.3	12 8.9
12	358 55.0	22 54.3	101 52.6	351 36.3	23 4.7	308 21.4	12 7.8
14	28 54.8	22 53.9	131 57.6	21 34.6	23 4.0	338 23.5	12 6.7
16	58 54.6	22 53.5	162 2.5	51 32.9	23 3.3	8 25.6	12 5.6
18	88 54.4	22 53.0	192 7.4	81 31.2	23 2.6	38 27.7	12 4.5
20	118 54.1	22 52.6	222 12.3	111 29.5	23 1.9	68 29.8	12 3.4
22	148 53.9	22 52.2	252 17.3	141 27.8	23 1.1	98 31.9	12 2.3
Δ	-1	-2		-9	-3	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	180 7.5	22	26 18.0	-57	351 33.8	-22 22.2	124 12.9	11 21.5
2	208 49.9	24	26 6.5	-61	21 39.4	-22 22.3	154 17.4	11 21.3
4	237 32.7	26	25 54.3	-65	51 45.0	-22 22.4	184 21.9	11 21.2
6	266 15.8	28	25 41.3	-69	81 50.6	-22 22.5	214 26.4	11 21.0
8	294 59.4	30	25 27.6	-72	111 56.2	-22 22.6	244 30.9	11 20.8
10	323 43.3	32	25 13.2	-76	142 1.8	-22 22.7	274 35.4	11 20.6
12	352 27.7	34	24 58.0	-79	172 7.4	-22 22.8	304 39.9	11 20.5
14	21 12.5	36	24 42.2	-83	202 13.0	-22 22.9	334 44.4	11 20.3
16	49 57.8	39	24 25.6	-86	232 18.7	-22 23.0	4 48.9	11 20.1
18	78 43.5	41	24 8.4	-89	262 24.3	-22 23.1	34 53.4	11 19.9
20	107 29.7	44	23 50.6	-92	292 29.9	-22 23.2	64 57.9	11 19.8
22	136 16.4	46	23 32.1	-96	322 35.5	-22 23.3	95 2.3	11 19.6
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 45	21 23	1 34	: ::	2 17	4.7	22 8	.3
55	3 28	20 41	0 56	: ::	3 13	4.0	21 26	.9
50	3 57	20 12	0 44	: ::	3 49	3.6	20 57	1.2
45	4 18	19 50	0 37	2 29	4 16	3.4	20 35	1.5
40	4 36	19 32	0 33	2 1	4 37	3.3	20 16	1.6
35	4 51	19 18	0 29	1 46	4 54	3.1	20 1	1.8
30	5 3	19 5	0 27	1 36	5 9	3.0	19 48	1.9
20	5 25	18 44	0 24	1 24	5 34	2.8	19 25	2.1
10	5 43	18 25	0 23	1 17	5 56	2.7	19 5	2.3
0	6 1	18 8	0 22	1 15	6 16	2.6	18 46	2.5
10	6 18	17 51	0 23	1 15	6 37	2.4	18 27	2.6
20	6 36	17 33	0 24	1 18	6 58	2.3	18 7	2.8
30	6 57	17 12	0 26	1 25	7 23	2.1	17 43	3.0
35	7 9	17 0	0 28	1 30	7 38	2.0	17 29	3.1
40	7 22	16 46	0 30	1 37	7 55	1.8	17 13	3.3
45	7 39	16 30	0 34	1 46	8 16	1.7	16 54	3.4
50	7 59	16 10	0 38	1 59	8 41	1.5	16 29	3.7
55	8 25	15 44	0 45	2 16	9 15	1.1	15 56	4.1
60	9 2	15 7	0 57	2 44	10 7	.5	15 6	4.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 14.2	-.5	15.8	$T_{\overline{m}}$	12 31	2.5	60.8	16.6
12	- 4 19.6	$T_{\overline{m}_\odot}$ 12 h 4.3 min		Starost 29.2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 34	.1	250	-3.8	♄	0 34	.0	70	-2.6
♂	15 26	.1	207	1.7	♄	15 41	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 53.7	22 51.7	282 22.2	171 26.1	23 .4	128 34.0	12 1.2
2	208 53.4	22 51.3	312 27.1	201 24.4	22 59.7	158 36.1	12 .0
4	238 53.2	22 50.8	342 32.1	231 22.7	22 59.0	188 38.2	11 58.9
6	268 53.0	22 50.4	12 37.0	261 21.0	22 58.2	218 40.3	11 57.8
8	298 52.8	22 49.9	42 41.9	291 19.3	22 57.5	248 42.4	11 56.7
10	328 52.6	22 49.5	72 46.8	321 17.6	22 56.8	278 44.5	11 55.6
12	358 52.3	22 49.0	102 51.8	351 15.9	22 56.0	308 46.6	11 54.4
14	28 52.1	22 48.6	132 56.7	21 14.2	22 55.3	338 48.7	11 53.3
16	58 51.9	22 48.1	163 1.6	51 12.5	22 54.5	8 50.8	11 52.2
18	88 51.7	22 47.6	193 6.6	81 10.8	22 53.7	38 52.9	11 51.1
20	118 51.5	22 47.2	223 11.5	111 9.1	22 53.0	68 55.0	11 50.0
22	148 51.2	22 46.7	253 16.4	141 7.4	22 52.2	98 57.1	11 48.8
Δ	-1	-2		-8	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	165 3.6	49	23 12.9	-99	352 41.1	-22 23.3	125 6.8	11 19.4
2	193 51.4	51	22 53.2	-101	22 46.7	-22 23.4	155 11.3	11 19.2
4	222 39.6	54	22 32.9	-104	52 52.3	-22 23.5	185 15.8	11 19.1
6	251 28.3	56	22 12.1	-107	82 57.9	-22 23.6	215 20.3	11 18.9
8	280 17.6	59	21 50.7	-110	113 3.5	-22 23.7	245 24.8	11 18.7
10	309 7.4	62	21 28.7	-112	143 9.1	-22 23.8	275 29.3	11 18.5
12	337 57.7	64	21 6.3	-115	173 14.7	-22 23.9	305 33.8	11 18.4
14	6 48.6	67	20 43.3	-117	203 20.4	-22 24.0	335 38.3	11 18.2
16	35 40.0	70	20 19.9	-119	233 26.0	-22 24.1	5 42.8	11 18.0
18	64 31.9	72	19 56.0	-122	263 31.6	-22 24.2	35 47.2	11 17.8
20	93 24.3	75	19 31.7	-124	293 37.2	-22 24.3	65 51.7	11 17.7
22	122 17.3	77	19 6.9	-126	323 42.8	-22 24.4	95 56.2	11 17.5
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 46	21 22	1 33	: ::	4 9	4.6	22 16	.2
55	3 28	20 40	0 56	: ::	4 49	4.0	21 48	.6
50	3 57	20 11	0 44	: ::	5 17	3.7	21 26	.9
45	4 19	19 50	0 37	2 28	5 38	3.4	21 10	1.1
40	4 37	19 32	0 33	2 1	5 55	3.2	20 56	1.3
35	4 51	19 18	0 29	1 46	6 9	3.1	20 44	1.5
30	5 4	19 5	0 27	1 36	6 21	2.9	20 34	1.6
20	5 25	18 44	0 24	1 23	6 43	2.7	20 16	1.8
10	5 44	18 25	0 23	1 17	7 1	2.5	20 0	2.0
0	6 1	18 8	0 22	1 15	7 18	2.3	19 45	2.2
10	6 18	17 51	0 23	1 15	7 35	2.2	19 30	2.4
20	6 36	17 33	0 24	1 18	7 53	2.0	19 14	2.6
30	6 56	17 13	0 26	1 25	8 14	1.7	18 55	2.8
35	7 8	17 1	0 28	1 30	8 26	1.6	18 44	3.0
40	7 22	16 47	0 30	1 37	8 40	1.5	18 32	3.1
45	7 38	16 31	0 34	1 46	8 56	1.3	18 17	3.3
50	7 58	16 11	0 38	1 59	9 16	1.0	17 58	3.6
55	8 25	15 45	0 45	2 16	9 42	.7	17 34	3.9
60	9 1	15 8	0 56	2 43	10 18	.2	16 60	4.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 25.1	-.4	15.8	$T_{\overline{m}}$	13 32	2.2	60.3	16.4
12	- 4 30.4	$T_{\overline{m}_\odot}$ 12 h 4.5 min		Starost .9 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 35	.1	249	-3.8	♄	0 29	.0	70	-2.6
♂	15 25	.1	206	1.7	♄	15 37	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 51.0	22 46.2	283 21.3	171 5.7	22 51.4	128 59.2	11 47.7
2	208 50.8	22 45.7	313 26.3	201 4.1	22 50.6	159 1.3	11 46.6
4	238 50.6	22 45.3	343 31.2	231 2.4	22 49.9	189 3.4	11 45.5
6	268 50.4	22 44.8	13 36.1	261 .7	22 49.1	219 5.5	11 44.4
8	298 50.2	22 44.3	43 41.1	290 59.0	22 48.3	249 7.6	11 43.2
10	328 49.9	22 43.8	73 46.0	320 57.3	22 47.5	279 9.7	11 42.1
12	358 49.7	22 43.3	103 50.9	350 55.6	22 46.7	309 11.8	11 41.0
14	28 49.5	22 42.8	133 55.8	20 53.9	22 45.9	339 13.9	11 39.9
16	58 49.3	22 42.3	164 .8	50 52.3	22 45.0	9 15.9	11 38.7
18	88 49.1	22 41.8	194 5.7	80 50.6	22 44.2	39 18.0	11 37.6
20	118 48.9	22 41.3	224 10.6	110 48.9	22 43.4	69 20.1	11 36.5
22	148 48.7	22 40.8	254 15.5	140 47.2	22 42.6	99 22.2	11 35.3
Δ	-1	-2		-8	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	151 10.8	80	18 41.8	-128	353 48.4	-22 24.5	126 .7	11 17.3
2	180 4.8	83	18 16.2	-130	23 54.0	-22 24.6	156 5.2	11 17.1
4	208 59.4	85	17 50.3	-131	53 59.6	-22 24.7	186 9.7	11 16.9
6	237 54.4	88	17 24.0	-133	84 5.3	-22 24.8	216 14.2	11 16.8
8	266 50.0	90	16 57.4	-135	114 10.9	-22 24.9	246 18.6	11 16.6
10	295 46.0	93	16 30.5	-136	144 16.5	-22 25.0	276 23.1	11 16.4
12	324 42.6	95	16 3.3	-138	174 22.1	-22 25.1	306 27.6	11 16.2
14	353 39.6	98	15 35.7	-139	204 27.7	-22 25.2	336 32.1	11 16.1
16	22 37.1	100	15 7.9	-140	234 33.3	-22 25.3	6 36.6	11 15.9
18	51 35.1	102	14 39.9	-142	264 38.9	-22 25.4	36 41.1	11 15.7
20	80 33.5	104	14 11.5	-143	294 44.5	-22 25.5	66 45.5	11 15.5
22	109 32.4	107	13 43.0	-144	324 50.2	-22 25.6	96 50.0	11 15.3
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 47	21 21	1 31	: ::	5 59	4.3	22 20	.1
55	3 29	20 39	0 56	: ::	6 25	3.8	22 2	.4
50	3 58	20 11	0 44	: ::	6 44	3.5	21 48	.7
45	4 20	19 49	0 37	2 28	6 60	3.2	21 37	.9
40	4 37	19 32	0 32	2 1	7 12	3.1	21 27	1.1
35	4 52	19 17	0 29	1 45	7 22	2.9	21 19	1.3
30	5 4	19 5	0 27	1 35	7 32	2.7	21 12	1.4
20	5 26	18 44	0 24	1 23	7 47	2.5	20 60	1.6
10	5 44	18 25	0 23	1 17	8 1	2.3	20 49	1.8
0	6 1	18 8	0 22	1 15	8 14	2.1	20 38	2.0
10	6 18	17 51	0 23	1 15	8 27	1.9	20 28	2.2
20	6 36	17 34	0 24	1 18	8 40	1.7	20 17	2.4
30	6 56	17 13	0 26	1 25	8 55	1.5	20 4	2.7
35	7 8	17 1	0 28	1 30	9 4	1.3	19 56	2.8
40	7 22	16 48	0 30	1 37	9 14	1.2	19 47	3.0
45	7 38	16 31	0 34	1 46	9 26	1.0	19 37	3.2
50	7 58	16 12	0 38	1 58	9 41	.8	19 24	3.4
55	8 24	15 46	0 45	2 16	9 58	.5	19 8	3.7
60	9 1	15 9	0 56	2 43	10 22	.1	18 47	4.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 35.8	-.4	15.8	$T_{\overline{m}}$ 14 26	2.1	59.6	16.3
12	− 4 40.9	$T_{\overline{m}_\odot}$ 12 h	4.7 min	Starost 1.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 36	.1	248	-3.8	♆	0 25	.0	70	-2.6
♂	15 23	.1	206	1.7	♇	15 34	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 48.4	22 40.3	284 20.5	170 45.6	22 41.7	129 24.3	11 34.2
2	208 48.2	22 39.8	314 25.4	200 43.9	22 40.9	159 26.4	11 33.1
4	238 48.0	22 39.3	344 30.3	230 42.2	22 40.1	189 28.5	11 32.0
6	268 47.8	22 38.8	14 35.3	260 40.5	22 39.2	219 30.6	11 30.8
8	298 47.6	22 38.3	44 40.2	290 38.9	22 38.4	249 32.7	11 29.7
10	328 47.4	22 37.7	74 45.1	320 37.2	22 37.5	279 34.8	11 28.6
12	358 47.2	22 37.2	104 50.0	350 35.5	22 36.7	309 36.9	11 27.4
14	28 47.0	22 36.7	134 55.0	20 33.9	22 35.8	339 39.0	11 26.3
16	58 46.8	22 36.2	164 59.9	50 32.2	22 34.9	9 41.1	11 25.2
18	88 46.6	22 35.6	195 4.8	80 30.6	22 34.0	39 43.2	11 24.0
20	118 46.4	22 35.1	225 9.8	110 28.9	22 33.2	69 45.3	11 22.9
22	148 46.2	22 34.6	255 14.7	140 27.2	22 32.3	99 47.4	11 21.8
Δ	-1	-3		-8	-4	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	138 31.8	109	13 14.3	-145	354 55.8	-22 25.7	126 54.5	11 15.2
2	167 31.5	111	12 45.3	-146	25 1.4	-22 25.8	156 59.0	11 15.0
4	196 31.7	113	12 16.2	-147	55 7.0	-22 25.9	187 3.5	11 14.8
6	225 32.4	115	11 46.9	-147	85 12.6	-22 26.0	217 7.9	11 14.6
8	254 33.4	117	11 17.4	-148	115 18.2	-22 26.1	247 12.4	11 14.4
10	283 34.8	119	10 47.8	-149	145 23.8	-22 26.2	277 16.9	11 14.3
12	312 36.6	121	10 18.0	-149	175 29.5	-22 26.3	307 21.4	11 14.1
14	341 38.8	123	9 48.2	-150	205 35.1	-22 26.4	337 25.9	11 13.9
16	10 41.3	124	9 18.2	-150	235 40.7	-22 26.5	7 30.3	11 13.7
18	39 44.2	126	8 48.1	-151	265 46.3	-22 26.5	37 34.8	11 13.5
20	68 47.5	128	8 18.0	-151	295 51.9	-22 26.6	67 39.3	11 13.4
22	97 51.0	129	7 47.7	-151	325 57.5	-22 26.7	97 43.8	11 13.2
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 49	21 20	1 30	: ::	7 41	4.0	22 22	.0
55	3 30	20 39	0 56	: ::	7 57	3.6	22 12	.4
50	3 59	20 10	0 43	: ::	8 8	3.3	22 5	.6
45	4 20	19 49	0 37	2 27	8 18	3.1	21 59	.8
40	4 38	19 32	0 32	2 0	8 25	2.9	21 54	1.0
35	4 52	19 17	0 29	1 45	8 32	2.7	21 50	1.1
30	5 5	19 5	0 27	1 35	8 38	2.6	21 46	1.3
20	5 26	18 44	0 24	1 23	8 48	2.3	21 39	1.5
10	5 44	18 25	0 23	1 17	8 56	2.1	21 33	1.7
0	6 1	18 9	0 22	1 15	9 4	1.9	21 27	1.9
10	6 18	17 52	0 23	1 15	9 13	1.7	21 21	2.1
20	6 36	17 34	0 24	1 18	9 21	1.5	21 15	2.3
30	6 56	17 14	0 26	1 25	9 31	1.3	21 8	2.5
35	7 8	17 2	0 28	1 30	9 37	1.2	21 3	2.7
40	7 22	16 48	0 30	1 37	9 43	1.0	20 59	2.8
45	7 38	16 32	0 33	1 46	9 50	.8	20 53	3.0
50	7 58	16 12	0 38	1 58	9 59	.6	20 46	3.2
55	8 23	15 47	0 45	2 16	10 10	.4	20 37	3.5
60	8 60	15 10	0 56	2 43	10 24	.0	20 26	3.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 46.0	-.4	15.8	$T_{\overline{m}}$ 15 16	1.9	58.8	16.0
12	− 4 51.0	$T_{\overline{m}_\odot}$ 12 h	4.9 min	Starost 2.9 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 38	.1	246	-3.8	♆	0 20	.0	71	-2.6
♂	15 21	.1	205	1.7	♇	15 30	.0	203	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 46.0	22 34.0	285 19.6	170 25.6	22 31.4	129 49.5	11 20.6
2	208 45.8	22 33.5	315 24.5	200 23.9	22 30.5	159 51.6	11 19.5
4	238 45.6	22 32.9	345 29.5	230 22.3	22 29.6	189 53.7	11 18.4
6	268 45.4	22 32.4	15 34.4	260 20.6	22 28.7	219 55.8	11 17.2
8	298 45.2	22 31.8	45 39.3	290 19.0	22 27.8	249 57.9	11 16.1
10	328 45.0	22 31.3	75 44.3	320 17.3	22 26.9	280 .0	11 15.0
12	358 44.8	22 30.7	105 49.2	350 15.7	22 26.0	310 2.1	11 13.8
14	28 44.6	22 30.2	135 54.1	20 14.0	22 25.1	340 4.2	11 12.7
16	58 44.4	22 29.6	165 59.0	50 12.4	22 24.1	10 6.3	11 11.5
18	88 44.2	22 29.0	196 4.0	80 10.7	22 23.2	40 8.4	11 10.4
20	118 44.0	22 28.5	226 8.9	110 9.1	22 22.3	70 10.5	11 9.3
22	148 43.8	22 27.9	256 13.8	140 7.5	22 21.3	100 12.6	11 8.1
Δ	-1	-3		-8	-5	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	126 54.9	131	7 17.5	-152	356 3.1	-22 26.8	127 48.2	11 13.0
2	155 59.1	132	6 47.1	-152	26 8.8	-22 26.9	157 52.7	11 12.8
4	185 3.6	134	6 16.7	-152	56 14.4	-22 27.0	187 57.2	11 12.6
6	214 8.4	135	5 46.3	-152	86 20.0	-22 27.1	218 1.7	11 12.4
8	243 13.5	137	5 15.9	-152	116 25.6	-22 27.2	248 6.1	11 12.3
10	272 18.8	138	4 45.5	-152	146 31.2	-22 27.3	278 10.6	11 12.1
12	301 24.4	139	4 15.0	-152	176 36.8	-22 27.4	308 15.1	11 11.9
14	330 30.2	140	3 44.6	-152	206 42.5	-22 27.5	338 19.6	11 11.7
16	359 36.3	141	3 14.2	-152	236 48.1	-22 27.6	8 24.0	11 11.5
18	28 42.5	142	2 43.8	-152	266 53.7	-22 27.7	38 28.5	11 11.4
20	57 49.0	143	2 13.5	-152	296 59.3	-22 27.8	68 33.0	11 11.2
22	86 55.7	144	1 43.2	-151	327 4.9	-22 27.9	98 37.5	11 11.0
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 50	21 19	1 28	: ::	9 16	3.7	22 23	.0
55	3 32	20 38	0 55	: ::	9 22	3.4	22 21	.3
50	3 60	20 10	0 43	: ::	9 27	3.1	22 20	.6
45	4 21	19 48	0 37	2 26	9 31	2.9	22 18	.8
40	4 38	19 31	0 32	2 0	9 34	2.7	22 17	.9
35	4 53	19 17	0 29	1 45	9 37	2.6	22 17	1.1
30	5 5	19 5	0 27	1 35	9 40	2.5	22 16	1.2
20	5 26	18 44	0 24	1 23	9 44	2.2	22 15	1.4
10	5 45	18 25	0 23	1 17	9 48	2.0	22 13	1.6
0	6 1	18 9	0 22	1 15	9 51	1.8	22 12	1.8
10	6 18	17 52	0 23	1 15	9 55	1.6	22 11	2.0
20	6 36	17 34	0 24	1 18	9 58	1.4	22 10	2.2
30	6 56	17 14	0 26	1 25	10 2	1.2	22 8	2.4
35	7 8	17 2	0 28	1 30	10 5	1.1	22 7	2.5
40	7 21	16 49	0 30	1 37	10 8	.9	22 6	2.7
45	7 37	16 33	0 33	1 46	10 11	.8	22 5	2.9
50	7 57	16 13	0 38	1 58	10 15	.6	22 3	3.1
55	8 23	15 48	0 45	2 16	10 19	.3	22 1	3.3
60	8 59	15 12	0 56	2 42	10 25	.0	21 59	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 4 55.9	-.4	15.8	$T_{\overline{m}}$	16 2	1.8	57.9	15.8
12	− 5 .7	$T_{\overline{m}_\odot}$	12 h 5.0 min	Starost	3.9 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 39	.1	245	-3.8	♃	0 16	.0	71	-2.6
♂	15 20	.1	204	1.7	♄	15 26	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 43.6	22 27.3	286 18.8	170 5.8	22 20.4	130 14.7	11 7.0
2	208 43.4	22 26.8	316 23.7	200 4.2	22 19.4	160 16.8	11 5.8
4	238 43.2	22 26.2	346 28.6	230 2.5	22 18.5	190 18.9	11 4.7
6	268 43.0	22 25.6	16 33.5	260 .9	22 17.5	220 21.0	11 3.5
8	298 42.8	22 25.0	46 38.5	289 59.3	22 16.6	250 23.1	11 2.4
10	328 42.6	22 24.4	76 43.4	319 57.6	22 15.6	280 25.2	11 1.3
12	358 42.5	22 23.8	106 48.3	349 56.0	22 14.6	310 27.3	11 .1
14	28 42.3	22 23.3	136 53.3	19 54.4	22 13.7	340 29.4	10 59.0
16	58 42.1	22 22.7	166 58.2	49 52.8	22 12.7	10 31.5	10 57.8
18	88 41.9	22 22.1	197 3.1	79 51.1	22 11.7	40 33.6	10 56.7
20	118 41.7	22 21.5	227 8.0	109 49.5	22 10.7	70 35.7	10 55.5
22	148 41.5	22 20.9	257 13.0	139 47.9	22 9.7	100 37.8	10 54.4
Δ	-1	-3		-8	-5	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	116 2.6	145	1 12.9	-151	357 10.5	-22 28.0	128 41.9	11 10.8
2	145 9.7	146	0 42.7	-151	27 16.1	-22 28.1	158 46.4	11 10.6
4	174 16.9	147	0 12.6	-150	57 21.8	-22 28.2	188 50.9	11 10.4
6	203 24.3	148	- 0 17.4	-150	87 27.4	-22 28.3	218 55.3	11 10.3
8	232 31.8	148	- 0 47.4	-149	117 33.0	-22 28.4	248 59.8	11 10.1
10	261 39.5	149	- 1 17.3	-149	147 38.6	-22 28.5	279 4.3	11 9.9
12	290 47.3	150	- 1 47.0	-148	177 44.2	-22 28.6	309 8.8	11 9.7
14	319 55.2	150	- 2 16.7	-148	207 49.9	-22 28.7	339 13.2	11 9.5
16	349 3.2	151	- 2 46.3	-147	237 55.5	-22 28.8	9 17.7	11 9.3
18	18 11.4	151	- 3 15.7	-147	268 1.1	-22 28.9	39 22.2	11 9.1
20	47 19.6	151	- 3 45.0	-146	298 6.7	-22 28.9	69 26.6	11 9.0
22	76 27.8	152	- 4 14.2	-145	328 12.3	-22 29.0	99 31.1	11 8.8
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 52	21 17	1 27	: ::	10 46	3.6	22 23	.0
55	3 33	20 37	0 55	: ::	10 44	3.3	22 29	.3
50	4 1	20 9	0 43	: ::	10 42	3.0	22 33	.6
45	4 22	19 48	0 37	2 26	10 41	2.8	22 37	.8
40	4 39	19 31	0 32	1 60	10 40	2.7	22 40	.9
35	4 53	19 17	0 29	1 45	10 39	2.5	22 42	1.1
30	5 6	19 4	0 27	1 35	10 38	2.4	22 45	1.2
20	5 27	18 44	0 24	1 23	10 37	2.2	22 49	1.4
10	5 45	18 26	0 23	1 17	10 36	2.0	22 52	1.6
0	6 2	18 9	0 22	1 14	10 35	1.8	22 55	1.8
10	6 18	17 52	0 23	1 15	10 34	1.6	22 58	1.9
20	6 36	17 35	0 24	1 18	10 33	1.4	23 2	2.1
30	6 56	17 14	0 26	1 25	10 32	1.2	23 6	2.4
35	7 8	17 3	0 28	1 30	10 31	1.1	23 8	2.5
40	7 21	16 49	0 30	1 37	10 30	.9	23 11	2.6
45	7 37	16 34	0 33	1 46	10 29	.8	23 14	2.8
50	7 57	16 14	0 38	1 58	10 28	.6	23 17	3.0
55	8 22	15 49	0 44	2 15	10 27	.3	23 21	3.3
60	8 57	15 13	0 55	2 42	10 26	.0	23 27	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 5.4	-.4	15.8	$T_{\overline{m}}$	16 45	1.8	56.9	15.5
12	− 5 9.9	$T_{\overline{m}_\odot}$	12 h 5.2 min	Starost	4.9 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 40	.1	244	-3.8	♃	0 11	.0	71	-2.6
♂	15 18	.1	204	1.7	♄	15 23	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 41.3	22 20.3	287 17.9	169 46.3	22 8.7	130 39.9	10 53.2
2	208 41.2	22 19.7	317 22.8	199 44.6	22 7.7	160 42.0	10 52.1
4	238 41.0	22 19.0	347 27.8	229 43.0	22 6.7	190 44.1	10 50.9
6	268 40.8	22 18.4	17 32.7	259 41.4	22 5.7	220 46.2	10 49.8
8	298 40.6	22 17.8	47 37.6	289 39.8	22 4.7	250 48.3	10 48.6
10	328 40.4	22 17.2	77 42.5	319 38.2	22 3.7	280 50.4	10 47.5
12	358 40.2	22 16.6	107 47.5	349 36.6	22 2.7	310 52.5	10 46.3
14	28 40.1	22 16.0	137 52.4	19 35.0	22 1.6	340 54.5	10 45.2
16	58 39.9	22 15.3	167 57.3	49 33.3	22 .6	10 56.6	10 44.0
18	88 39.7	22 14.7	198 2.2	79 31.7	21 59.6	40 58.7	10 42.9
20	118 39.5	22 14.1	228 7.2	109 30.1	21 58.5	71 .8	10 41.7
22	148 39.4	22 13.4	258 12.1	139 28.5	21 57.5	101 2.9	10 40.6
Δ	-1	-3		-8	-5	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	105 36.2	152 - 4 43.2		-144	358 17.9	-22 29.1	129 35.6	11 8.6
2	134 44.6	152 - 5 12.1		-144	28 23.6	-22 29.2	159 40.0	11 8.4
4	163 53.0	152 - 5 40.8		-143	58 29.2	-22 29.3	189 44.5	11 8.2
6	193 1.5	153 - 6 9.4		-142	88 34.8	-22 29.4	219 49.0	11 8.0
8	222 10.0	153 - 6 37.8		-141	118 40.4	-22 29.5	249 53.4	11 7.9
10	251 18.6	153 - 7 6.1		-140	148 46.0	-22 29.6	279 57.9	11 7.7
12	280 27.1	153 - 7 34.1		-139	178 51.6	-22 29.7	310 2.4	11 7.5
14	309 35.7	153 - 8 2.0		-139	208 57.3	-22 29.8	340 6.8	11 7.3
16	338 44.2	153 - 8 29.7		-138	239 2.9	-22 29.9	10 11.3	11 7.1
18	7 52.7	153 - 8 57.2		-137	269 8.5	-22 30.0	40 15.7	11 6.9
20	37 1.2	152 - 9 24.5		-136	299 14.1	-22 30.1	70 20.2	11 6.7
22	66 9.7	152 - 9 51.6		-134	329 19.7	-22 30.2	100 24.7	11 6.6
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 53	21 16	1 25	: ::	12 13	3.6	22 24	.1
55	3 34	20 36	0 55	: ::	12 3	3.3	22 37	.4
50	4 2	20 8	0 43	: ::	11 55	3.0	22 47	.6
45	4 23	19 48	0 36	2 25	11 49	2.8	22 55	.8
40	4 40	19 31	0 32	1 59	11 44	2.6	23 2	1.0
35	4 54	19 17	0 29	1 45	11 39	2.5	23 8	1.1
30	5 6	19 4	0 27	1 35	11 35	2.3	23 13	1.2
20	5 27	18 43	0 24	1 23	11 29	2.1	23 22	1.4
10	5 45	18 26	0 23	1 17	11 23	1.9	23 30	1.6
0	6 2	18 9	0 22	1 14	11 17	1.8	23 38	1.8
10	6 18	17 52	0 23	1 15	11 12	1.6	23 45	2.0
20	6 36	17 35	0 24	1 18	11 6	1.4	23 53	2.1
30	6 56	17 15	0 26	1 25	10 60	1.2	. . ..	.0
35	7 7	17 3	0 28	1 30	10 56	1.1	. . ..	.0
40	7 21	16 50	0 30	1 37	10 52	1.0	. . ..	.0
45	7 37	16 34	0 33	1 46	10 47	.8	. . ..	.0
50	7 56	16 15	0 38	1 58	10 42	.6	. . ..	.0
55	8 21	15 50	0 44	2 15	10 35	.4	. . ..	.0
60	8 56	15 15	0 55	2 41	10 26	.0	. . ..	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 14.5	-.4	15.8	$T_{\overline{m}}$	17 28	1.7	56.1	15.3
12	- 5 18.8	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost 5.9 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 42	.1	242	-3.8	♃	0 7	.0	71	-2.6
♂	15 16	.1	203	1.7	♄	15 19	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 39.2	22 12.8	288 17.0	169 26.9	21 56.4	131 5.0	10 39.4
2	208 39.0	22 12.2	318 22.0	199 25.3	21 55.4	161 7.1	10 38.3
4	238 38.8	22 11.5	348 26.9	229 23.7	21 54.3	191 9.2	10 37.1
6	268 38.7	22 10.9	18 31.8	259 22.1	21 53.3	221 11.3	10 36.0
8	298 38.5	22 10.2	48 36.7	289 20.5	21 52.2	251 13.4	10 34.8
10	328 38.3	22 9.6	78 41.7	319 19.0	21 51.1	281 15.5	10 33.7
12	358 38.1	22 8.9	108 46.6	349 17.4	21 50.1	311 17.6	10 32.5
14	28 38.0	22 8.3	138 51.5	19 15.8	21 49.0	341 19.7	10 31.3
16	58 37.8	22 7.6	168 56.5	49 14.2	21 47.9	11 21.8	10 30.2
18	88 37.6	22 7.0	199 1.4	79 12.6	21 46.8	41 23.9	10 29.0
20	118 37.5	22 6.3	229 6.3	109 11.0	21 45.7	71 26.0	10 27.9
22	148 37.3	22 5.6	259 11.2	139 9.4	21 44.6	101 28.1	10 26.7
Δ	-1	-3		-8	-5	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	95 18.1	152 -10 18.5		-133	359 25.3	-22 30.3	130 29.1	11 6.4
2	124 26.5	152 -10 45.2		-132	29 31.0	-22 30.4	160 33.6	11 6.2
4	153 34.8	151 -11 11.7		-131	59 36.6	-22 30.5	190 38.1	11 6.0
6	182 43.1	151 -11 37.9		-130	89 42.2	-22 30.6	220 42.5	11 5.8
8	211 51.3	150 -12 3.9		-129	119 47.8	-22 30.6	250 47.0	11 5.6
10	240 59.4	150 -12 29.6		-128	149 53.4	-22 30.7	280 51.4	11 5.4
12	270 7.4	150 -12 55.1		-126	179 59.0	-22 30.8	310 55.9	11 5.2
14	299 15.3	149 -13 20.4		-125	210 4.7	-22 30.9	341 .4	11 5.1
16	328 23.1	148 -13 45.4		-124	240 10.3	-22 31.0	11 4.8	11 4.9
18	357 30.8	148 -14 10.2		-122	270 15.9	-22 31.1	41 9.3	11 4.7
20	26 38.4	147 -14 34.7		-121	300 21.5	-22 31.2	71 13.7	11 4.5
22	55 45.8	147 -14 58.9		-120	330 27.1	-22 31.3	101 18.2	11 4.3
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 55	21 15	1 24	: ::	13 40	3.7	22 25	.1
55	3 35	20 35	0 54	: ::	13 21	3.2	22 46	.5
50	4 3	20 8	0 43	: ::	13 7	3.0	23 2	.8
45	4 24	19 47	0 36	2 24	12 56	2.8	23 15	1.0
40	4 40	19 30	0 32	1 59	12 46	2.6	23 26	1.1
35	4 54	19 16	0 29	1 44	12 39	2.5	23 35	1.2
30	5 7	19 4	0 27	1 35	12 32	2.3	23 43	1.3
20	5 27	18 43	0 24	1 23	12 20	2.1	23 57	1.5
10	5 45	18 26	0 23	1 17	12 10	2.0	. . ..	.0
0	6 2	18 9	0 22	1 14	11 60	1.8	. . ..	.0
10	6 18	17 53	0 23	1 15	11 50	1.7	. . ..	.0
20	6 36	17 35	0 24	1 18	11 40	1.5	. . ..	.0
30	6 56	17 15	0 26	1 25	11 29	1.3	0 3	2.3
35	7 7	17 4	0 28	1 30	11 22	1.2	0 8	2.5
40	7 20	16 51	0 30	1 36	11 15	1.0	0 14	2.6
45	7 36	16 35	0 33	1 45	11 6	.9	0 21	2.8
50	7 55	16 16	0 38	1 58	10 56	.7	0 30	3.0
55	8 20	15 51	0 44	2 15	10 43	.4	0 41	3.2
60	8 55	15 16	0 55	2 41	10 27	.1	0 55	3.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 23.1	-.3	15.8	$T_{\overline{m}}$	18 10	1.8	55.4	15.1
12	- 5 27.2	$T_{\overline{m}_\odot}$ 12 h 5.5 min		Starost 6.9 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 43	.1	241	-3.8	♃	0 2	.0	71	-2.6
♂	15 15	.1	203	1.7	♄	15 16	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 37.1	22 5.0	289 16.2	169 7.8	21 43.5	131 30.2	10 25.6
2	208 37.0	22 4.3	319 21.1	199 6.3	21 42.4	161 32.3	10 24.4
4	238 36.8	22 3.6	349 26.0	229 4.7	21 41.3	191 34.4	10 23.2
6	268 36.6	22 3.0	19 31.0	259 3.1	21 40.2	221 36.5	10 22.1
8	298 36.5	22 2.3	49 35.9	289 1.5	21 39.1	251 38.6	10 20.9
10	328 36.3	22 1.6	79 40.8	318 60.0	21 37.9	281 40.7	10 19.8
12	358 36.2	22 .9	109 45.7	348 58.4	21 36.8	311 42.8	10 18.6
14	28 36.0	22 .2	139 50.7	18 56.8	21 35.7	341 44.9	10 17.4
16	58 35.8	21 59.5	169 55.6	48 55.3	21 34.5	11 47.0	10 16.3
18	88 35.7	21 58.8	200 .5	78 53.7	21 33.4	41 49.1	10 15.1
20	118 35.5	21 58.1	230 5.5	108 52.1	21 32.3	71 51.2	10 13.9
22	148 35.4	21 57.5	260 10.4	138 50.6	21 31.1	101 53.3	10 12.8
Δ	-1	-3		-8	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	84 53.2	146	-15 22.8	-118	0 32.7	-22 31.4	131 22.7	11 4.1
2	114 .3	145	-15 46.5	-117	30 38.4	-22 31.5	161 27.1	11 3.9
4	143 7.4	144	-16 9.8	-115	60 44.0	-22 31.6	191 31.6	11 3.7
6	172 14.3	144	-16 32.9	-114	90 49.6	-22 31.7	221 36.0	11 3.5
8	201 21.0	143	-16 55.7	-112	120 55.2	-22 31.8	251 40.5	11 3.4
10	230 27.6	142	-17 18.2	-111	151 .8	-22 31.9	281 44.9	11 3.2
12	259 34.0	141	-17 40.3	-109	181 6.4	-22 32.0	311 49.4	11 3.0
14	288 40.3	140	-18 2.2	-108	211 12.1	-22 32.1	341 53.9	11 2.8
16	317 46.3	139	-18 23.7	-106	241 17.7	-22 32.1	11 58.3	11 2.6
18	346 52.2	139	-18 44.9	-104	271 23.3	-22 32.2	42 2.8	11 2.4
20	15 57.9	138	-19 5.8	-103	301 28.9	-22 32.3	72 7.2	11 2.2
22	45 3.4	137	-19 26.3	-101	331 34.5	-22 32.4	102 11.7	11 2.0
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 57	21 13	1 22	: ::	15 7	3.7	22 28	.2
55	3 36	20 34	0 54	: ::	14 39	3.2	22 58	.7
50	4 4	20 7	0 43	3 46	14 18	3.0	23 20	1.0
45	4 24	19 46	0 36	2 23	14 2	2.7	23 38	1.1
40	4 41	19 30	0 32	1 58	13 49	2.6	23 52	1.3
35	4 55	19 16	0 29	1 44	13 38	2.5	.. ..	.0
30	5 7	19 4	0 27	1 34	13 28	2.4	.. ..	.0
20	5 28	18 43	0 24	1 23	13 11	2.2	.. ..	.0
10	5 46	18 26	0 23	1 17	12 57	2.0	0 9	1.7
0	6 2	18 9	0 22	1 14	12 43	1.9	0 21	1.8
10	6 18	17 53	0 23	1 15	12 30	1.7	0 32	2.0
20	6 36	17 36	0 24	1 18	12 16	1.6	0 45	2.2
30	6 55	17 16	0 26	1 25	11 60	1.4	0 59	2.4
35	7 7	17 4	0 28	1 30	11 50	1.3	1 7	2.5
40	7 20	16 51	0 30	1 36	11 40	1.2	1 17	2.6
45	7 36	16 36	0 33	1 45	11 28	1.0	1 28	2.8
50	7 55	16 17	0 38	1 57	11 13	.8	1 41	3.0
55	8 19	15 52	0 44	2 14	10 54	.6	1 59	3.2
60	8 54	15 18	0 55	2 40	10 29	.2	2 22	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 31.3	-.3	15.8	$T_{\overline{m}}$	18 54	1.9	54.8	14.9
12	− 5 35.2	$T_{\overline{m}_\odot}$	12 h 5.6 min	Starost	7.9 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 44	.1	240	-3.8	♃	23 53	.0	71	-2.6
♂	15 13	.1	202	1.7	♄	15 12	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 35.2	21 56.8	290 15.3	168 49.0	21 30.0	131 55.4	10 11.6
2	208 35.0	21 56.1	320 20.2	198 47.4	21 28.8	161 57.5	10 10.4
4	238 34.9	21 55.3	350 25.2	228 45.9	21 27.6	191 59.6	10 9.3
6	268 34.7	21 54.6	20 30.1	258 44.3	21 26.5	222 1.7	10 8.1
8	298 34.6	21 53.9	50 35.0	288 42.8	21 25.3	252 3.8	10 6.9
10	328 34.4	21 53.2	80 40.0	318 41.2	21 24.1	282 5.9	10 5.8
12	358 34.3	21 52.5	110 44.9	348 39.7	21 22.9	312 8.0	10 4.6
14	28 34.1	21 51.8	140 49.8	18 38.1	21 21.8	342 10.1	10 3.4
16	58 34.0	21 51.1	170 54.7	48 36.6	21 20.6	12 12.2	10 2.3
18	88 33.8	21 50.3	200 59.7	78 35.0	21 19.4	42 14.3	10 1.1
20	118 33.7	21 49.6	231 4.6	108 33.5	21 18.2	72 16.4	9 59.9
22	148 33.5	21 48.9	261 9.5	138 32.0	21 17.0	102 18.5	9 58.8
Δ	-1	-4		-8	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	74 8.8	136	-19 46.5	-99	1 40.1	-22 32.5	132 16.1	11 1.8
2	103 13.9	135	-20 6.4	-97	31 45.8	-22 32.6	162 20.6	11 1.7
4	132 18.8	134	-20 25.9	-96	61 51.4	-22 32.7	192 25.0	11 1.5
6	161 23.5	133	-20 45.0	-94	91 57.0	-22 32.8	222 29.5	11 1.3
8	190 28.0	132	-21 3.8	-92	122 2.6	-22 32.9	252 33.9	11 1.1
10	219 32.3	130	-21 22.2	-90	152 8.2	-22 33.0	282 38.4	11 .9
12	248 36.4	129	-21 40.2	-88	182 13.8	-22 33.1	312 42.8	11 .7
14	277 40.3	128	-21 57.8	-86	212 19.5	-22 33.2	342 47.3	11 .5
16	306 44.0	127	-22 15.1	-84	242 25.1	-22 33.3	12 51.7	11 .3
18	335 47.4	126	-22 31.9	-82	272 30.7	-22 33.4	42 56.2	11 .1
20	4 50.6	125	-22 48.4	-80	302 36.3	-22 33.4	73 .6	10 59.9
22	33 53.7	124	-23 4.4	-78	332 41.9	-22 33.5	103 5.1	10 59.7
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	2 59	21 12	1 21	: ::	16 37	3.7	22 33	.4
55	3 38	20 33	0 53	: ::	15 57	3.1	23 14	1.0
50	4 5	20 6	0 42	3 36	15 29	2.9	23 43	1.2
45	4 25	19 46	0 36	2 22	15 8	2.7	.. ..	.0
40	4 42	19 29	0 32	1 58	14 51	2.6	.. ..	.0
35	4 56	19 15	0 29	1 44	14 37	2.4	0 5	1.4
30	5 8	19 4	0 27	1 34	14 25	2.4	0 15	1.5
20	5 28	18 43	0 24	1 23	14 4	2.2	0 34	1.7
10	5 46	18 26	0 23	1 17	13 46	2.1	0 50	1.8
0	6 2	18 9	0 22	1 14	13 29	2.0	1 5	1.9
10	6 18	17 53	0 23	1 15	13 12	1.9	1 20	2.1
20	6 35	17 36	0 24	1 18	12 54	1.7	1 36	2.2
30	6 55	17 16	0 26	1 24	12 34	1.6	1 55	2.4
35	7 7	17 5	0 28	1 30	12 22	1.5	2 6	2.5
40	7 20	16 52	0 30	1 36	12 8	1.4	2 19	2.6
45	7 35	16 37	0 33	1 45	11 52	1.3	2 34	2.7
50	7 54	16 18	0 37	1 57	11 33	1.1	2 52	2.9
55	8 18	15 54	0 44	2 14	11 8	.8	3 16	3.2
60	8 52	15 19	0 54	2 40	10 32	.3	3 50	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 39.0	-.3	15.8	$T_{\overline{m}}$	19 40	2.0	54.4	14.8
12	− 5 42.6	$T_{\overline{m}_\odot}$	12 h 5.7 min	Starost	8.9 d	Faza	◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 45	.1	239	-3.8	♃	23 49	.0	71	-2.6
♂	15 11	.1	202	1.7	♄	15 9	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 33.4	21 48.2	291 14.4	168 30.4	21 15.8	132 20.6	9 57.6
2	208 33.2	21 47.4	321 19.4	198 28.9	21 14.6	162 22.7	9 56.4
4	238 33.1	21 46.7	351 24.3	228 27.3	21 13.4	192 24.8	9 55.2
6	268 33.0	21 46.0	21 29.2	258 25.8	21 12.1	222 26.9	9 54.1
8	298 32.8	21 45.2	51 34.2	288 24.3	21 10.9	252 29.0	9 52.9
10	328 32.7	21 44.5	81 39.1	318 22.7	21 9.7	282 31.1	9 51.7
12	358 32.5	21 43.7	111 44.0	348 21.2	21 8.5	312 33.2	9 50.6
14	28 32.4	21 43.0	141 48.9	18 19.7	21 7.2	342 35.3	9 49.4
16	58 32.3	21 42.2	171 53.9	48 18.2	21 6.0	12 37.4	9 48.2
18	88 32.1	21 41.5	201 58.8	78 16.6	21 4.7	42 39.5	9 47.0
20	118 32.0	21 40.7	232 3.7	108 15.1	21 3.5	72 41.6	9 45.9
22	148 31.8	21 40.0	262 8.7	138 13.6	21 2.2	102 43.6	9 44.7
Δ	-1	-4		-8	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	62 56.4	123	-23 20.1	-76	2 47.5	-22 33.6	133 9.5	10 59.6
2	91 59.0	122	-23 35.3	-74	32 53.1	-22 33.7	163 14.0	10 59.4
4	121 1.4	121	-23 50.1	-72	62 58.8	-22 33.8	193 18.4	10 59.2
6	150 3.5	120	-24 4.5	-70	93 4.4	-22 33.9	223 22.9	10 59.0
8	179 5.4	119	-24 18.4	-68	123 10.0	-22 34.0	253 27.3	10 58.8
10	208 7.2	117	-24 31.9	-65	153 15.6	-22 34.1	283 31.8	10 58.6
12	237 8.6	116	-24 45.0	-63	183 21.2	-22 34.2	313 36.2	10 58.4
14	266 9.9	115	-24 57.6	-61	213 26.8	-22 34.3	343 40.7	10 58.2
16	295 11.0	114	-25 9.8	-59	243 32.4	-22 34.4	13 45.1	10 58.0
18	324 11.9	113	-25 21.5	-56	273 38.1	-22 34.5	43 49.6	10 57.8
20	353 12.6	112	-25 32.7	-54	303 43.7	-22 34.5	73 54.0	10 57.6
22	22 13.0	111	-25 43.5	-51	333 49.3	-22 34.6	103 58.5	10 57.4
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 0	21 10	1 20	: ::	18 5	3.4	22 43	1.0
55	3 39	20 32	0 53	: ::	17 12	2.9	23 38	1.5
50	4 6	20 5	0 42	3 29	16 38	2.7	.. ..	.0
45	4 26	19 45	0 36	2 21	16 12	2.5	0 6	1.4
40	4 42	19 29	0 32	1 58	15 52	2.4	0 23	1.5
35	4 56	19 15	0 29	1 43	15 36	2.4	0 38	1.6
30	5 8	19 3	0 27	1 34	15 21	2.3	0 51	1.7
20	5 29	18 43	0 24	1 22	14 57	2.2	1 14	1.8
10	5 46	18 26	0 23	1 17	14 36	2.1	1 33	1.9
0	6 2	18 9	0 22	1 14	14 16	2.1	1 51	2.0
10	6 18	17 53	0 23	1 15	13 57	2.0	2 10	2.1
20	6 35	17 36	0 24	1 18	13 36	1.9	2 29	2.2
30	6 55	17 17	0 26	1 24	13 12	1.8	2 52	2.3
35	7 6	17 6	0 28	1 29	12 58	1.7	3 5	2.4
40	7 19	16 53	0 30	1 36	12 42	1.7	3 21	2.5
45	7 34	16 38	0 33	1 45	12 23	1.6	3 39	2.6
50	7 53	16 19	0 37	1 57	11 59	1.4	4 2	2.8
55	8 17	15 55	0 44	2 14	11 27	1.2	4 33	3.0
60	8 51	15 21	0 54	2 39	10 40	.7	5 19	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 46.3	-.3	15.8	$T_{\overline{m}}$	20 28	2.1	54.2	14.8
12	- 5 49.6	$T_{\overline{m}_\odot}$	12 h 5.8 min	Starost	9.9 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 47	.1	237	-3.8	♃	23 44	.0	72	-2.6
♂	15 10	.1	201	1.7	♄	15 5	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.7	21 39.2	292 13.6	168 12.1	21 1.0	132 45.7	9 43.5
2	208 31.6	21 38.4	322 18.5	198 10.6	20 59.7	162 47.8	9 42.3
4	238 31.4	21 37.7	352 23.4	228 9.1	20 58.5	192 49.9	9 41.1
6	268 31.3	21 36.9	22 28.4	258 7.5	20 57.2	222 52.0	9 40.0
8	298 31.2	21 36.1	52 33.3	288 6.0	20 55.9	252 54.1	9 38.8
10	328 31.0	21 35.4	82 38.2	318 4.5	20 54.7	282 56.2	9 37.6
12	358 30.9	21 34.6	112 43.2	348 3.0	20 53.4	312 58.3	9 36.4
14	28 30.8	21 33.8	142 48.1	18 1.5	20 52.1	343 .4	9 35.2
16	58 30.6	21 33.0	172 53.0	48 .0	20 50.8	13 2.5	9 34.1
18	88 30.5	21 32.2	202 57.9	77 58.5	20 49.5	43 4.6	9 32.9
20	118 30.4	21 31.5	233 2.9	107 57.0	20 48.2	73 6.7	9 31.7
22	148 30.3	21 30.7	263 7.8	137 55.5	20 46.9	103 8.8	9 30.5
Δ	-1	-4		-8	-6	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	51 13.3	110	-25 53.8	-49	3 54.9	-22 34.7	134 2.9	10 57.2
2	80 13.4	110	-26 3.6	-47	34 .5	-22 34.8	164 7.4	10 57.0
4	109 13.3	109	-26 12.9	-44	64 6.1	-22 34.9	194 11.8	10 56.9
6	138 13.0	108	-26 21.8	-42	94 11.7	-22 35.0	224 16.2	10 56.7
8	167 12.6	107	-26 30.1	-39	124 17.3	-22 35.1	254 20.7	10 56.5
10	196 11.9	106	-26 38.0	-37	154 23.0	-22 35.2	284 25.1	10 56.3
12	225 11.1	105	-26 45.3	-34	184 28.6	-22 35.3	314 29.6	10 56.1
14	254 10.2	105	-26 52.2	-32	214 34.2	-22 35.4	344 34.0	10 55.9
16	283 9.1	104	-26 58.5	-29	244 39.8	-22 35.5	14 38.5	10 55.7
18	312 7.9	103	-27 4.4	-27	274 45.4	-22 35.5	44 42.9	10 55.5
20	341 6.5	102	-27 9.7	-24	304 51.0	-22 35.6	74 47.3	10 55.3
22	10 5.0	102	-27 14.5	-21	334 56.6	-22 35.7	104 51.8	10 55.1
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 2	21 8	1 18	: ::	19 26	2.5	23 7	2.0
55	3 40	20 31	0 53	: ::	18 21	2.4	.. ..	.0
50	4 7	20 4	0 42	3 23	17 42	2.3	0 13	1.6
45	4 27	19 44	0 36	2 21	17 13	2.3	0 39	1.7
40	4 43	19 28	0 32	1 57	16 51	2.2	1 0	1.8
35	4 57	19 15	0 29	1 43	16 33	2.2	1 17	1.9
30	5 9	19 3	0 27	1 34	16 17	2.2	1 32	1.9
20	5 29	18 43	0 24	1 22	15 50	2.2	1 58	2.0
10	5 46	18 26	0 23	1 16	15 27	2.2	2 20	2.1
0	6 2	18 10	0 22	1 14	15 6	2.1	2 40	2.1
10	6 18	17 54	0 23	1 14	14 45	2.1	3 1	2.2
20	6 35	17 37	0 24	1 18	14 22	2.1	3 23	2.2
30	6 55	17 18	0 26	1 24	13 56	2.0	3 48	2.3
35	7 6	17 6	0 28	1 29	13 40	2.0	4 3	2.3
40	7 19	16 54	0 30	1 36	13 22	2.0	4 21	2.4
45	7 34	16 38	0 33	1 45	13 1	1.9	4 42	2.4
50	7 52	16 20	0 37	1 57	12 33	1.9	5 9	2.5
55	8 16	15 56	0 44	2 13	11 56	1.8	5 46	2.6
60	8 49	15 23	0 54	2 39	10 57	1.4	6 45	3.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 5 53.0	-.3	15.8	$T_{\overline{m}}$	21 18	2.2	54.1	14.7
12	- 5 56.1	$T_{\overline{m}_\odot}$	12 h 5.9 min	Starost	10.9 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 48	.1	236	-3.8	♃	23 40	.0	72	-2.6
♂	15 8	.1	201	1.7	♄	15 2	.0	202	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 30.1	21 29.9	293 12.7	167 54.0	20 45.6	133 10.9	9 29.3
2	208 30.0	21 29.1	323 17.7	197 52.5	20 44.3	163 13.0	9 28.2
4	238 29.9	21 28.3	353 22.6	227 51.0	20 43.0	193 15.1	9 27.0
6	268 29.8	21 27.5	23 27.5	257 49.6	20 41.7	223 17.2	9 25.8
8	298 29.6	21 26.7	53 32.4	287 48.1	20 40.3	253 19.3	9 24.6
10	328 29.5	21 25.9	83 37.4	317 46.6	20 39.0	283 21.4	9 23.4
12	358 29.4	21 25.1	113 42.3	347 45.1	20 37.7	313 23.5	9 22.2
14	28 29.3	21 24.3	143 47.2	17 43.6	20 36.4	343 25.6	9 21.1
16	58 29.2	21 23.4	173 52.2	47 42.1	20 35.0	13 27.7	9 19.9
18	88 29.1	21 22.6	203 57.1	77 40.7	20 33.7	43 29.8	9 18.7
20	118 28.9	21 21.8	234 2.0	107 39.2	20 32.3	73 31.9	9 17.5
22	148 28.8	21 21.0	264 6.9	137 37.7	20 31.0	103 34.0	9 16.3
Δ	-1	-4		-7	-7	10	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	39 3.4	101	-27 18.8	-19	5 2.2	-22 35.8	134 56.2	10 54.9
2	68 1.6	101	-27 22.5	-16	35 7.8	-22 35.9	165 .7	10 54.7
4	96 59.8	100	-27 25.7	-13	65 13.5	-22 36.0	195 5.1	10 54.5
6	125 57.9	100	-27 28.4	-11	95 19.1	-22 36.1	225 9.5	10 54.3
8	154 55.9	100	-27 30.6	-8	125 24.7	-22 36.2	255 14.0	10 54.1
10	183 53.8	99	-27 32.2	-5	155 30.3	-22 36.3	285 18.4	10 53.9
12	212 51.6	99	-27 33.3	-3	185 35.9	-22 36.4	315 22.9	10 53.7
14	241 49.4	99	-27 33.8	0	215 41.5	-22 36.4	345 27.3	10 53.5
16	270 47.1	98	-27 33.9	3	245 47.1	-22 36.5	15 31.7	10 53.3
18	299 44.8	98	-27 33.3	5	275 52.7	-22 36.6	45 36.2	10 53.1
20	328 42.4	98	-27 32.3	8	305 58.3	-22 36.7	75 40.6	10 52.9
22	357 40.0	98	-27 30.7	11	336 3.9	-22 36.8	105 45.1	10 52.8
Δ					28	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 4	21 7	1 17	: ::	20 26	1.3	23 54	3.1
55	3 42	20 30	0 52	: ::	19 17	1.7	0 13	2.1
50	4 8	20 4	0 42	3 19	18 37	1.9	0 53	2.1
45	4 28	19 44	0 36	2 20	18 8	1.9	1 21	2.1
40	4 44	19 28	0 32	1 57	17 45	2.0	1 44	2.1
35	4 58	19 14	0 29	1 43	17 26	2.0	2 2	2.1
30	5 9	19 3	0 27	1 34	17 10	2.0	2 18	2.1
20	5 29	18 43	0 24	1 22	16 43	2.1	2 46	2.1
10	5 46	18 26	0 23	1 16	16 19	2.1	3 9	2.1
0	6 2	18 10	0 22	1 14	15 57	2.2	3 31	2.1
10	6 18	17 54	0 23	1 14	15 35	2.2	3 52	2.1
20	6 35	17 37	0 24	1 18	15 12	2.2	4 16	2.1
30	6 54	17 18	0 26	1 24	14 45	2.2	4 43	2.1
35	7 5	17 7	0 28	1 29	14 28	2.3	4 59	2.1
40	7 18	16 54	0 30	1 36	14 10	2.3	5 18	2.1
45	7 33	16 39	0 33	1 45	13 47	2.3	5 40	2.1
50	7 51	16 21	0 37	1 56	13 18	2.4	6 9	2.1
55	8 15	15 57	0 43	2 13	12 38	2.4	6 49	2.0
60	8 48	15 25	0 53	2 38	11 31	2.6	7 56	1.9
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 5 59.3	-.2	15.8	$T_{\overline{m}}$ 22 10	2.1	54.1	14.7
12	- 6 2.1	$T_{\overline{m}_\odot}$ 12 h 6.0 min		Starost 11.9 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 49	.1	235	-3.8	♃	23 35	.0	72	-2.6
♂	15 6	.1	200	1.7	♄	14 58	.0	202	.8

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 28.7	21 20.2	294 11.9	167 36.2	20 29.6	133 36.1	9 15.1
2	208 28.6	21 19.4	324 16.8	197 34.8	20 28.3	163 38.2	9 13.9
4	238 28.5	21 18.5	354 21.7	227 33.3	20 26.9	193 40.3	9 12.7
6	268 28.4	21 17.7	24 26.7	257 31.8	20 25.5	223 42.4	9 11.6
8	298 28.3	21 16.9	54 31.6	287 30.4	20 24.2	253 44.5	9 10.4
10	328 28.1	21 16.0	84 36.5	317 28.9	20 22.8	283 46.6	9 9.2
12	358 28.0	21 15.2	114 41.4	347 27.4	20 21.4	313 48.7	9 8.0
14	28 27.9	21 14.4	144 46.4	17 26.0	20 20.0	343 50.8	9 6.8
16	58 27.8	21 13.5	174 51.3	47 24.5	20 18.7	13 52.9	9 5.6
18	88 27.7	21 12.7	204 56.2	77 23.1	20 17.3	43 55.0	9 4.4
20	118 27.6	21 11.8	235 1.1	107 21.6	20 15.9	73 57.1	9 3.2
22	148 27.5	21 11.0	265 6.1	137 20.2	20 14.5	103 59.2	9 2.0
Δ	-1	-4		-7	-7	10	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	26 37.6	98	-27 28.5	13	6 9.5	-22 36.9	135 49.5	10 52.6
2	55 35.3	98	-27 25.8	16	36 15.1	-22 37.0	165 53.9	10 52.4
4	84 32.9	98	-27 22.6	19	66 20.8	-22 37.1	195 58.4	10 52.2
6	113 30.5	98	-27 18.8	22	96 26.4	-22 37.2	226 2.8	10 52.0
8	142 28.2	98	-27 14.5	24	126 32.0	-22 37.2	256 7.2	10 51.8
10	171 25.8	99	-27 9.6	27	156 37.6	-22 37.3	286 11.7	10 51.6
12	200 23.6	99	-27 4.2	30	186 43.2	-22 37.4	316 16.1	10 51.4
14	229 21.4	99	-26 58.3	32	216 48.8	-22 37.5	346 20.5	10 51.2
16	258 19.2	100	-26 51.8	35	246 54.4	-22 37.6	16 25.0	10 51.0
18	287 17.1	100	-26 44.8	38	276 60.0	-22 37.7	46 29.4	10 50.8
20	316 15.1	100	-26 37.3	40	307 5.6	-22 37.8	76 33.8	10 50.6
22	345 13.2	101	-26 29.2	43	337 11.2	-22 37.9	106 38.3	10 50.4
Δ					28	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 6	21 5	1 16	: ::	20 58	.6	. . ..	.0
55	3 43	20 28	0 52	: ::	19 59	1.2	1 3	2.7
50	4 9	20 3	0 42	3 15	19 21	1.4	1 43	2.6
45	4 29	19 43	0 36	2 19	18 54	1.6	2 12	2.5
40	4 45	19 27	0 32	1 56	18 32	1.7	2 35	2.4
35	4 58	19 14	0 29	1 43	18 14	1.8	2 54	2.4
30	5 10	19 2	0 27	1 33	17 59	1.8	3 10	2.3
20	5 30	18 42	0 24	1 22	17 33	2.0	3 37	2.3
10	5 47	18 25	0 23	1 16	17 10	2.0	4 0	2.2
0	6 3	18 10	0 22	1 14	16 49	2.1	4 22	2.1
10	6 18	17 54	0 22	1 14	16 28	2.2	4 44	2.1
20	6 35	17 38	0 24	1 17	16 5	2.3	5 7	2.0
30	6 54	17 19	0 26	1 24	15 38	2.4	5 34	1.9
35	7 5	17 8	0 28	1 29	15 23	2.4	5 50	1.9
40	7 18	16 55	0 30	1 36	15 5	2.5	6 8	1.8
45	7 32	16 40	0 33	1 44	14 43	2.6	6 31	1.8
50	7 51	16 22	0 37	1 56	14 15	2.7	6 59	1.6
55	8 14	15 59	0 43	2 13	13 36	3.0	7 38	1.4
60	8 46	15 26	0 53	2 38	12 33	3.5	8 42	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 6 5.0	-.2	15.8	$T_{\overline{m}}$ 23 1	2.1	54.3	14.8
12	- 6 7.6	$T_{\overline{m}_\odot}$ 12 h 6.1 min		Starost 12.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 50	.1	233	-3.8	♃	23 31	.0	72	-2.6
♂	15 5	.1	199	1.7	♄	14 54	.0	202	.8

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 27.4	21 10.1	295 11.0	167 18.7	20 13.1	134 1.3	9 .8
2	208 27.3	21 9.3	325 15.9	197 17.3	20 11.7	164 3.4	8 59.6
4	238 27.2	21 8.4	355 20.9	227 15.8	20 10.3	194 5.5	8 58.5
6	268 27.1	21 7.5	25 25.8	257 14.4	20 8.8	224 7.6	8 57.3
8	298 27.0	21 6.7	55 30.7	287 13.0	20 7.4	254 9.7	8 56.1
10	328 26.9	21 5.8	85 35.6	317 11.5	20 6.0	284 11.8	8 54.9
12	358 26.8	21 5.0	115 40.6	347 10.1	20 4.6	314 13.9	8 53.7
14	28 26.7	21 4.1	145 45.5	17 8.6	20 3.1	344 15.9	8 52.5
16	58 26.6	21 3.2	175 50.4	47 7.2	20 1.7	14 18.0	8 51.3
18	88 26.5	21 2.3	205 55.4	77 5.8	20 .3	44 20.1	8 50.1
20	118 26.4	21 1.5	236 .3	107 4.4	19 58.8	74 22.2	8 48.9
22	148 26.3	21 .6	266 5.2	137 2.9	19 57.4	104 24.3	8 47.7
Δ	0	-4		-7	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	14 11.4	101	-26 20.6	46	7 16.8	-22 38.0	136 42.7	10 50.2
2	43 9.7	102	-26 11.5	48	37 22.4	-22 38.0	166 47.1	10 50.0
4	72 8.1	103	-26 1.8	51	67 28.0	-22 38.1	196 51.6	10 49.8
6	101 6.6	103	-25 51.7	53	97 33.6	-22 38.2	226 56.0	10 49.6
8	130 5.2	104	-25 41.0	56	127 39.2	-22 38.3	257 .4	10 49.4
10	159 4.0	105	-25 29.8	58	157 44.8	-22 38.4	287 4.9	10 49.2
12	188 2.9	105	-25 18.1	61	187 50.4	-22 38.5	317 9.3	10 49.0
14	217 2.0	106	-25 6.0	63	217 56.0	-22 38.6	347 13.7	10 48.8
16	246 1.2	107	-24 53.3	66	248 1.6	-22 38.7	17 18.2	10 48.6
18	275 .6	108	-24 40.1	68	278 7.2	-22 38.7	47 22.6	10 48.4
20	304 .1	108	-24 26.4	71	308 12.8	-22 38.8	77 27.0	10 48.2
22	332 59.8	109	-24 12.3	73	338 18.4	-22 38.9	107 31.4	10 48.0
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 8	21 3	1 14	: ::	21 13	.3	1 10	3.7
55	3 45	20 27	0 52	: ::	20 27	.8	2 8	3.2
50	4 10	20 2	0 41	3 11	19 56	1.1	2 45	2.9
45	4 30	19 42	0 36	2 18	19 32	1.3	3 12	2.7
40	4 46	19 26	0 32	1 56	19 13	1.4	3 33	2.6
35	4 59	19 13	0 29	1 42	18 57	1.5	3 51	2.5
30	5 10	19 2	0 27	1 33	18 43	1.6	4 6	2.4
20	5 30	18 42	0 24	1 22	18 19	1.8	4 31	2.3
10	5 47	18 25	0 23	1 16	17 59	1.9	4 53	2.2
0	6 3	18 10	0 22	1 14	17 40	2.1	5 14	2.1
10	6 18	17 54	0 22	1 14	17 20	2.2	5 34	2.0
20	6 35	17 38	0 24	1 17	16 60	2.3	5 56	1.9
30	6 54	17 19	0 26	1 24	16 36	2.5	6 21	1.7
35	7 4	17 8	0 28	1 29	16 21	2.6	6 35	1.7
40	7 17	16 56	0 30	1 36	16 5	2.7	6 52	1.6
45	7 32	16 41	0 33	1 44	15 45	2.8	7 13	1.4
50	7 50	16 23	0 37	1 56	15 21	3.0	7 38	1.3
55	8 13	16 0	0 43	2 12	14 47	3.3	8 12	1.0
60	8 45	15 28	0 53	2 37	13 56	3.8	9 5	.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 6 10.2	-.2	15.8	$T_{\overline{m}}$	23 52	2.0	54.5	14.9
12	- 6 12.5	$T_{\overline{m}_\odot}$	12 h 6.2 min	Starost 13.9 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 51	.1	232	-3.8	♃	23 27	.0	72	-2.6
♂	15 3	.1	199	1.7	♄	14 51	.0	202	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 26.2	20 59.7	296 10.1	167 1.5	19 55.9	134 26.4	8 46.5
2	208 26.1	20 58.8	326 15.1	197 .1	19 54.5	164 28.5	8 45.3
4	238 26.1	20 57.9	356 20.0	226 58.7	19 53.0	194 30.6	8 44.1
6	268 26.0	20 57.0	26 24.9	256 57.2	19 51.6	224 32.7	8 42.9
8	298 25.9	20 56.2	56 29.9	286 55.8	19 50.1	254 34.8	8 41.7
10	328 25.8	20 55.3	86 34.8	316 54.4	19 48.6	284 36.9	8 40.5
12	358 25.7	20 54.4	116 39.7	346 53.0	19 47.2	314 39.0	8 39.3
14	28 25.6	20 53.5	146 44.6	16 51.6	19 45.7	344 41.1	8 38.1
16	58 25.5	20 52.6	176 49.6	46 50.2	19 44.2	14 43.2	8 36.9
18	88 25.4	20 51.7	206 54.5	76 48.8	19 42.7	44 45.3	8 35.7
20	118 25.4	20 50.8	236 59.4	106 47.4	19 41.2	74 47.4	8 34.5
22	148 25.3	20 49.8	267 4.4	136 46.0	19 39.7	104 49.5	8 33.3
Δ	0	-4		-7	-7	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	1 59.7	110	-23 57.6	76	8 24.0	-22 39.0	137 35.9	10 47.8
2	30 59.7	111	-23 42.5	78	38 29.6	-22 39.1	167 40.3	10 47.6
4	59 59.9	112	-23 26.9	80	68 35.2	-22 39.2	197 44.7	10 47.4
6	89 .3	113	-23 10.9	82	98 40.8	-22 39.3	227 49.2	10 47.2
8	118 .9	114	-22 54.4	85	128 46.4	-22 39.4	257 53.6	10 47.0
10	147 1.7	115	-22 37.5	87	158 52.0	-22 39.4	287 58.0	10 46.8
12	176 2.7	116	-22 20.1	89	188 57.6	-22 39.5	318 2.4	10 46.6
14	205 3.8	117	-22 2.3	91	219 3.2	-22 39.6	348 6.9	10 46.4
16	234 5.2	118	-21 44.0	93	249 8.8	-22 39.7	18 11.3	10 46.2
18	263 6.8	119	-21 25.3	96	279 14.4	-22 39.8	48 15.7	10 46.0
20	292 8.5	120	-21 6.2	98	309 20.0	-22 39.9	78 20.2	10 45.8
22	321 10.5	121	-20 46.7	100	339 25.6	-22 40.0	108 24.6	10 45.6
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 10	21 1	1 13	: ::	21 20	.1	2 39	3.9
55	3 46	20 26	0 51	: ::	20 46	.6	3 24	3.4
50	4 11	20 1	0 41	3 7	20 22	.9	3 55	3.1
45	4 31	19 41	0 35	2 17	20 3	1.1	4 17	2.9
40	4 46	19 26	0 31	1 55	19 47	1.2	4 36	2.7
35	4 60	19 13	0 29	1 42	19 34	1.3	4 51	2.6
30	5 11	19 1	0 27	1 33	19 22	1.5	5 4	2.5
20	5 30	18 42	0 24	1 22	19 3	1.7	5 26	2.3
10	5 47	18 25	0 23	1 16	18 45	1.8	5 46	2.1
0	6 3	18 10	0 22	1 14	18 29	2.0	6 4	2.0
10	6 18	17 55	0 22	1 14	18 13	2.1	6 22	1.9
20	6 34	17 38	0 24	1 17	17 55	2.3	6 41	1.7
30	6 53	17 20	0 26	1 24	17 35	2.5	7 2	1.5
35	7 4	17 9	0 27	1 29	17 23	2.6	7 15	1.4
40	7 16	16 57	0 30	1 35	17 9	2.7	7 30	1.3
45	7 31	16 42	0 33	1 44	16 53	2.9	7 47	1.2
50	7 49	16 24	0 37	1 56	16 32	3.1	8 8	1.0
55	8 11	16 2	0 43	2 12	16 6	3.4	8 36	.7
60	8 43	15 30	0 53	2 36	15 28	3.9	9 15	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 6 14.9	-.2	15.8	$T_{\overline{m}}$	. . .	1.0	54.9	15.0
12	- 6 16.9	$T_{\overline{m}_\odot}$	12 h 6.3 min	Starost 14.9 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 53	.1	231	-3.8	♃	23 22	.0	72	-2.6
♂	15 1	.1	198	1.7	♄	14 47	.0	201	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.2	20 48.9	297 9.3	166 44.6	19 38.3	134 51.6	8 32.1
2	208 25.1	20 48.0	327 14.2	196 43.2	19 36.8	164 53.7	8 30.9
4	238 25.0	20 47.1	357 19.1	226 41.8	19 35.2	194 55.8	8 29.7
6	268 25.0	20 46.2	27 24.1	256 40.4	19 33.7	224 57.9	8 28.5
8	298 24.9	20 45.3	57 29.0	286 39.0	19 32.2	254 60.0	8 27.3
10	328 24.8	20 44.3	87 33.9	316 37.6	19 30.7	285 2.1	8 26.1
12	358 24.7	20 43.4	117 38.9	346 36.2	19 29.2	315 4.2	8 24.9
14	28 24.7	20 42.5	147 43.8	16 34.8	19 27.7	345 6.3	8 23.6
16	58 24.6	20 41.6	177 48.7	46 33.4	19 26.2	15 8.4	8 22.4
18	88 24.5	20 40.6	207 53.6	76 32.1	19 24.6	45 10.5	8 21.2
20	118 24.4	20 39.7	237 58.6	106 30.7	19 23.1	75 12.6	8 20.0
22	148 24.4	20 38.8	268 3.5	136 29.3	19 21.6	105 14.7	8 18.8
Δ	0	−5		−7	−8	10	−6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	350 12.6	122	−20 26.8	102	9 31.2	−22 40.0	138 29.0	10 45.4
2	19 15.0	123	−20 6.4	104	39 36.8	−22 40.1	168 33.4	10 45.2
4	48 17.5	124	−19 45.7	105	69 42.4	−22 40.2	198 37.9	10 45.0
6	77 20.2	125	−19 24.6	107	99 48.0	−22 40.3	228 42.3	10 44.8
8	106 23.2	126	−19 3.1	109	129 53.6	−22 40.4	258 46.7	10 44.6
10	135 26.3	127	−18 41.3	111	159 59.2	−22 40.5	288 51.1	10 44.4
12	164 29.6	127	−18 19.1	113	190 4.8	−22 40.6	318 55.6	10 44.2
14	193 33.1	128	−17 56.5	115	220 10.4	−22 40.6	348 60.0	10 44.0
16	222 36.8	129	−17 33.6	116	250 16.0	−22 40.7	19 4.4	10 43.8
18	251 40.6	130	−17 10.3	118	280 21.6	−22 40.8	49 8.8	10 43.6
20	280 44.7	131	−16 46.7	120	310 27.2	−22 40.9	79 13.2	10 43.4
22	309 48.9	132	−16 22.8	121	340 32.8	−22 41.0	109 17.7	10 43.2
Δ					28	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 12	20 59	1 12	: ::	21 24	.1	4 13	3.9
55	3 48	20 24	0 51	: ::	21 0	.4	4 45	3.4
50	4 13	19 59	0 41	3 4	20 42	.7	5 8	3.1
45	4 32	19 40	0 35	2 16	20 28	.9	5 26	2.9
40	4 47	19 25	0 31	1 55	20 16	1.1	5 40	2.7
35	5 0	19 12	0 29	1 42	20 6	1.2	5 53	2.6
30	5 11	19 1	0 27	1 33	19 58	1.3	6 3	2.5
20	5 31	18 42	0 24	1 22	19 42	1.5	6 22	2.3
10	5 47	18 25	0 23	1 16	19 29	1.7	6 37	2.1
0	6 3	18 10	0 22	1 14	19 16	1.9	6 52	1.9
10	6 18	17 55	0 22	1 14	19 3	2.1	7 6	1.8
20	6 34	17 39	0 24	1 17	18 50	2.2	7 22	1.6
30	6 53	17 20	0 26	1 24	18 34	2.5	7 39	1.4
35	7 3	17 10	0 27	1 29	18 25	2.6	7 50	1.3
40	7 16	16 57	0 30	1 35	18 14	2.7	8 1	1.1
45	7 30	16 43	0 33	1 44	18 2	2.9	8 15	1.0
50	7 48	16 26	0 37	1 56	17 47	3.1	8 31	.8
55	8 10	16 3	0 43	2 12	17 27	3.4	8 52	.5
60	8 41	15 32	0 52	2 36	17 1	3.8	9 21	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 6 19.0	−.1	15.8	$T_{\overline{m}}$ 0 40	2.0	55.3	15.1
12	− 6 20.8	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 15.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 54	.1	230	−3.8	♃	23 18	.0	72	−2.6
♂	14 60	.1	198	1.7	♄	14 44	.0	201	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.3	20 37.8	298 8.4	166 27.9	19 20.0	135 16.8	8 17.6
2	208 24.2	20 36.9	328 13.3	196 26.5	19 18.5	165 18.8	8 16.4
4	238 24.2	20 35.9	358 18.3	226 25.2	19 16.9	195 20.9	8 15.2
6	268 24.1	20 35.0	28 23.2	256 23.8	19 15.4	225 23.0	8 14.0
8	298 24.0	20 34.0	58 28.1	286 22.4	19 13.8	255 25.1	8 12.8
10	328 24.0	20 33.1	88 33.1	316 21.1	19 12.2	285 27.2	8 11.6
12	358 23.9	20 32.1	118 38.0	346 19.7	19 10.7	315 29.3	8 10.3
14	28 23.9	20 31.2	148 42.9	16 18.3	19 9.1	345 31.4	8 9.1
16	58 23.8	20 30.2	178 47.8	46 17.0	19 7.5	15 33.5	8 7.9
18	88 23.7	20 29.3	208 52.8	76 15.6	19 6.0	45 35.6	8 6.7
20	118 23.7	20 28.3	238 57.7	106 14.3	19 4.4	75 37.7	8 5.5
22	148 23.6	20 27.3	269 2.6	136 12.9	19 2.8	105 39.8	8 4.3
Δ	0	−5		−7	−8	10	−6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 53.3	133	−15 58.5	123	10 38.4	−22 41.1	139 22.1	10 43.0
2	7 57.9	134	−15 34.0	124	40 43.9	−22 41.2	169 26.5	10 42.8
4	37 2.6	134	−15 9.1	126	70 49.5	−22 41.2	199 30.9	10 42.6
6	66 7.5	135	−14 43.9	127	100 55.1	−22 41.3	229 35.4	10 42.4
8	95 12.5	136	−14 18.4	129	131 .7	−22 41.4	259 39.8	10 42.2
10	124 17.7	137	−13 52.7	130	161 6.3	−22 41.5	289 44.2	10 42.0
12	153 23.0	137	−13 26.7	131	191 11.9	−22 41.6	319 48.6	10 41.8
14	182 28.5	138	−13 .4	133	221 17.5	−22 41.7	349 53.0	10 41.5
16	211 34.1	139	−12 33.9	134	251 23.1	−22 41.7	19 57.5	10 41.3
18	240 39.8	139	−12 7.1	135	281 28.7	−22 41.8	50 1.9	10 41.1
20	269 45.7	140	−11 40.0	136	311 34.3	−22 41.9	80 6.3	10 40.9
22	298 51.6	140	−11 12.7	138	341 39.8	−22 42.0	110 10.7	10 40.7
Δ					28	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 14	20 57	1 11	: ::	21 25	.0	5 46	3.8
55	3 49	20 23	0 50	: ::	21 11	.4	6 7	3.4
50	4 14	19 58	0 41	3 1	20 59	.6	6 23	3.1
45	4 33	19 40	0 35	2 15	20 50	.8	6 36	2.9
40	4 48	19 24	0 31	1 54	20 42	1.0	6 46	2.7
35	5 1	19 12	0 29	1 41	20 35	1.1	6 55	2.6
30	5 12	19 0	0 27	1 32	20 29	1.2	7 3	2.4
20	5 31	18 42	0 24	1 21	20 19	1.5	7 16	2.2
10	5 48	18 25	0 23	1 16	20 10	1.7	7 27	2.0
0	6 3	18 10	0 22	1 13	20 1	1.8	7 38	1.9
10	6 18	17 55	0 22	1 14	19 53	2.0	7 49	1.7
20	6 34	17 39	0 24	1 17	19 44	2.2	7 60	1.5
30	6 52	17 21	0 26	1 24	19 33	2.4	8 13	1.3
35	7 3	17 10	0 27	1 29	19 27	2.6	8 20	1.2
40	7 15	16 58	0 30	1 35	19 20	2.7	8 29	1.0
45	7 29	16 44	0 33	1 44	19 12	2.9	8 38	.8
50	7 47	16 27	0 37	1 55	19 2	3.1	8 50	.6
55	8 9	16 5	0 43	2 11	18 49	3.4	9 4	.4
60	8 39	15 34	0 52	2 35	18 33	3.8	9 23	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 6 22.6	−.1	15.8	$T_{\overline{m}}$ 1 27	1.9	55.7	15.2
12	− 6 24.1	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 16.9 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 55	.1	228	−3.8	♃	23 13	.0	72	−2.6
♂	14 58	.1	197	1.7	♄	14 40	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.6	20 26.4	299 7.6	166 11.6	19 1.2	135 41.9	8 3.1
2	208 23.5	20 25.4	329 12.5	196 10.2	18 59.6	165 44.0	8 1.9
4	238 23.4	20 24.4	359 17.4	226 8.9	18 58.0	195 46.1	8 .6
6	268 23.4	20 23.4	29 22.3	256 7.5	18 56.4	225 48.2	7 59.4
8	298 23.3	20 22.5	59 27.3	286 6.2	18 54.8	255 50.3	7 58.2
10	328 23.3	20 21.5	89 32.2	316 4.8	18 53.2	285 52.4	7 57.0
12	358 23.2	20 20.5	119 37.1	346 3.5	18 51.6	315 54.5	7 55.8
14	28 23.2	20 19.5	149 42.1	16 2.2	18 50.0	345 56.6	7 54.6
16	58 23.1	20 18.5	179 47.0	46 .8	18 48.4	15 58.7	7 53.4
18	88 23.1	20 17.5	209 51.9	75 59.5	18 46.8	46 .8	7 52.1
20	118 23.0	20 16.5	239 56.8	105 58.2	18 45.2	76 2.9	7 50.9
22	148 23.0	20 15.5	270 1.8	135 56.8	18 43.5	106 4.9	7 49.7
Δ	0	−5		−7	−8	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	327 57.7	141	−10 45.2	139	11 45.4	−22 42.1	140 15.1	10 40.5
2	357 3.9	141	−10 17.5	140	41 51.0	−22 42.2	170 19.5	10 40.3
4	26 10.2	142	− 9 49.5	141	71 56.6	−22 42.2	200 24.0	10 40.1
6	55 16.5	142	− 9 21.4	142	102 2.2	−22 42.3	230 28.4	10 39.9
8	84 23.0	143	− 8 53.0	143	132 7.8	−22 42.4	260 32.8	10 39.7
10	113 29.5	143	− 8 24.5	144	162 13.4	−22 42.5	290 37.2	10 39.5
12	142 36.0	143	− 7 55.8	144	192 18.9	−22 42.6	320 41.6	10 39.3
14	171 42.7	143	− 7 26.9	145	222 24.5	−22 42.7	350 46.0	10 39.1
16	200 49.3	144	− 6 57.8	146	252 30.1	−22 42.7	20 50.5	10 38.9
18	229 56.1	144	− 6 28.6	147	282 35.7	−22 42.8	50 54.9	10 38.7
20	259 2.8	144	− 5 59.2	148	312 41.3	−22 42.9	80 59.3	10 38.5
22	288 9.6	144	− 5 29.7	148	342 46.9	−22 43.0	111 3.7	10 38.3
Δ					28	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 16	20 55	1 10	: ::	21 26	.0	7 16	3.7
55	3 51	20 21	0 50	: ::	21 19	.3	7 29	3.4
50	4 15	19 57	0 41	2 58	21 14	.6	7 38	3.1
45	4 34	19 39	0 35	2 14	21 9	.8	7 45	2.9
40	4 49	19 24	0 31	1 54	21 6	.9	7 51	2.7
35	5 2	19 11	0 29	1 41	21 2	1.1	7 57	2.6
30	5 13	18 60	0 27	1 32	20 59	1.2	8 1	2.4
20	5 32	18 41	0 24	1 21	20 54	1.4	8 9	2.2
10	5 48	18 25	0 23	1 16	20 50	1.6	8 16	2.0
0	6 3	18 10	0 22	1 13	20 46	1.8	8 23	1.8
10	6 18	17 55	0 22	1 14	20 41	2.0	8 29	1.6
20	6 34	17 39	0 23	1 17	20 37	2.2	8 36	1.4
30	6 52	17 21	0 26	1 24	20 32	2.5	8 44	1.2
35	7 2	17 11	0 27	1 29	20 29	2.6	8 48	1.1
40	7 14	16 59	0 30	1 35	20 25	2.7	8 53	1.0
45	7 28	16 45	0 32	1 44	20 21	2.9	8 59	.8
50	7 45	16 28	0 36	1 55	20 16	3.1	9 5	.6
55	8 7	16 6	0 42	2 11	20 10	3.4	9 14	.3
60	8 37	15 36	0 52	2 35	20 3	3.8	9 25	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 25.6	−.1	15.8	$T_{\overline{m}}$ 2 12	1.8	56.2	15.3
12	− 6 26.8	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 17.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 56	.1	227	−3.8	♄	23 9	.0	73	−2.6
♂	14 56	.1	197	1.7	♃	14 37	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.9	20 14.6	300 6.7	165 55.5	18 41.9	136 7.0	7 48.5
2	208 22.9	20 13.6	330 11.6	195 54.2	18 40.3	166 9.1	7 47.3
4	238 22.8	20 12.5	0 16.6	225 52.8	18 38.6	196 11.2	7 46.0
6	268 22.8	20 11.5	30 21.5	255 51.5	18 37.0	226 13.3	7 44.8
8	298 22.8	20 10.5	60 26.4	285 50.2	18 35.4	256 15.4	7 43.6
10	328 22.7	20 9.5	90 31.3	315 48.9	18 33.7	286 17.5	7 42.4
12	358 22.7	20 8.5	120 36.3	345 47.6	18 32.1	316 19.6	7 41.2
14	28 22.6	20 7.5	150 41.2	15 46.3	18 30.4	346 21.7	7 39.9
16	58 22.6	20 6.5	180 46.1	45 44.9	18 28.8	16 23.8	7 38.7
18	88 22.6	20 5.5	210 51.1	75 43.6	18 27.1	46 25.9	7 37.5
20	118 22.5	20 4.5	240 56.0	105 42.3	18 25.4	76 28.0	7 36.3
22	148 22.5	20 3.4	271 .9	135 41.0	18 23.8	106 30.1	7 35.1
Δ	0	−5		−7	−8	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	317 16.4	144	− 5 .0	149	12 52.4	−22 43.1	141 8.1	10 38.1
2	346 23.2	144	− 4 30.2	150	42 58.0	−22 43.2	171 12.5	10 37.9
4	15 30.0	144	− 4 .3	150	73 3.6	−22 43.2	201 16.9	10 37.7
6	44 36.8	144	− 3 30.3	151	103 9.2	−22 43.3	231 21.4	10 37.5
8	73 43.5	144	− 3 .2	151	133 14.8	−22 43.4	261 25.8	10 37.2
10	102 50.3	144	− 2 30.0	151	163 20.3	−22 43.5	291 30.2	10 37.0
12	131 57.0	143	− 1 59.7	152	193 25.9	−22 43.6	321 34.6	10 36.8
14	161 3.6	143	− 1 29.3	152	223 31.5	−22 43.7	351 39.0	10 36.6
16	190 10.2	143	− 0 58.9	153	253 37.1	−22 43.7	21 43.4	10 36.4
18	219 16.8	142	− 0 28.4	153	283 42.7	−22 43.8	51 47.8	10 36.2
20	248 23.2	142	0 2.2	153	313 48.2	−22 43.9	81 52.2	10 36.0
22	277 29.6	141	0 32.8	153	343 53.8	−22 44.0	111 56.7	10 35.8
Δ					28	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 19	20 53	1 9	: ::	21 27	.0	8 46	3.8
55	3 52	20 20	0 50	: ::	21 27	.3	8 50	3.4
50	4 16	19 56	0 40	2 55	21 28	.6	8 53	3.2
45	4 35	19 38	0 35	2 13	21 28	.8	8 55	2.9
40	4 50	19 23	0 31	1 53	21 28	1.0	8 57	2.8
35	5 2	19 10	0 28	1 41	21 28	1.1	8 59	2.6
30	5 13	18 59	0 26	1 32	21 29	1.2	8 60	2.5
20	5 32	18 41	0 24	1 21	21 29	1.5	9 2	2.2
10	5 48	18 25	0 22	1 16	21 29	1.7	9 5	2.0
0	6 3	18 10	0 22	1 13	21 30	1.9	9 7	1.8
10	6 18	17 55	0 22	1 14	21 30	2.1	9 9	1.7
20	6 33	17 40	0 23	1 17	21 30	2.3	9 11	1.5
30	6 51	17 22	0 26	1 23	21 31	2.5	9 13	1.2
35	7 2	17 12	0 27	1 28	21 31	2.6	9 14	1.1
40	7 13	16 60	0 29	1 35	21 31	2.8	9 16	.9
45	7 27	16 46	0 32	1 43	21 31	3.0	9 17	.8
50	7 44	16 29	0 36	1 55	21 32	3.2	9 20	.6
55	8 6	16 8	0 42	2 11	21 32	3.5	9 22	.3
60	8 35	15 38	0 51	2 34	21 33	3.8	9 25	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 28.1	−.1	15.8	$T_{\overline{m}}$ 2 56	1.8	56.7	15.5
12	− 6 29.0	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 18.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	12 57	.1	226	−3.8	♄	23 4	.0	73	−2.6
♂	14 54	.1	196	1.7	♃	14 33	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.5	20 2.4	301 5.8	165 39.7	18 22.1	136 32.2	7 33.8
2	208 22.4	20 1.4	331 10.8	195 38.4	18 20.4	166 34.3	7 32.6
4	238 22.4	20 .3	1 15.7	225 37.1	18 18.7	196 36.4	7 31.4
6	268 22.4	19 59.3	31 20.6	255 35.8	18 17.0	226 38.5	7 30.2
8	298 22.3	19 58.3	61 25.6	285 34.5	18 15.4	256 40.5	7 28.9
10	328 22.3	19 57.2	91 30.5	315 33.2	18 13.7	286 42.6	7 27.7
12	358 22.3	19 56.2	121 35.4	345 32.0	18 12.0	316 44.7	7 26.5
14	28 22.3	19 55.2	151 40.3	15 30.7	18 10.3	346 46.8	7 25.3
16	58 22.2	19 54.1	181 45.3	45 29.4	18 8.6	16 48.9	7 24.0
18	88 22.2	19 53.1	211 50.2	75 28.1	18 6.9	46 51.0	7 22.8
20	118 22.2	19 52.0	241 55.1	105 26.8	18 5.2	76 53.1	7 21.6
22	148 22.2	19 51.0	272 .0	135 25.5	18 3.5	106 55.2	7 20.4
Δ	0	-5		-6	-8	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	306 35.9	141	1 3.4	153	13 59.4	-22 44.1	142 1.1	10 35.6
2	335 42.0	140	1 34.1	153	44 5.0	-22 44.1	172 5.5	10 35.4
4	4 48.1	140	2 4.8	153	74 10.5	-22 44.2	202 9.9	10 35.2
6	33 54.0	139	2 35.5	153	104 16.1	-22 44.3	232 14.3	10 35.0
8	62 59.8	138	3 6.2	153	134 21.7	-22 44.4	262 18.7	10 34.8
10	92 5.5	137	3 36.9	153	164 27.2	-22 44.5	292 23.1	10 34.6
12	121 10.9	137	4 7.5	153	194 32.8	-22 44.5	322 27.5	10 34.4
14	150 16.3	136	4 38.2	153	224 38.4	-22 44.6	352 31.9	10 34.1
16	179 21.4	135	5 8.8	153	254 44.0	-22 44.7	22 36.3	10 33.9
18	208 26.4	134	5 39.3	152	284 49.5	-22 44.8	52 40.8	10 33.7
20	237 31.2	133	6 9.8	152	314 55.1	-22 44.9	82 45.2	10 33.5
22	266 35.7	132	6 40.2	152	345 .7	-22 44.9	112 49.6	10 33.3
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 21	20 51	1 8	: ::	21 27	.1	10 17	3.9
55	3 54	20 18	0 49	: ::	21 36	.4	10 12	3.5
50	4 18	19 55	0 40	2 53	21 42	.7	10 9	3.3
45	4 36	19 37	0 35	2 12	21 47	.9	10 6	3.0
40	4 51	19 22	0 31	1 53	21 51	1.1	10 3	2.8
35	5 3	19 10	0 28	1 40	21 55	1.2	10 1	2.7
30	5 14	18 59	0 26	1 32	21 59	1.3	9 59	2.6
20	5 32	18 41	0 24	1 21	22 4	1.6	9 56	2.3
10	5 48	18 25	0 22	1 15	22 10	1.8	9 53	2.1
0	6 3	18 10	0 22	1 13	22 15	2.0	9 51	1.9
10	6 18	17 55	0 22	1 14	22 20	2.2	9 48	1.7
20	6 33	17 40	0 23	1 17	22 25	2.4	9 45	1.5
30	6 51	17 22	0 26	1 23	22 31	2.6	9 42	1.3
35	7 1	17 12	0 27	1 28	22 34	2.7	9 41	1.2
40	7 13	17 1	0 29	1 35	22 38	2.9	9 39	1.0
45	7 26	16 47	0 32	1 43	22 43	3.1	9 36	.8
50	7 43	16 30	0 36	1 55	22 49	3.3	9 33	.6
55	8 4	16 9	0 42	2 10	22 56	3.6	9 30	.4
60	8 33	15 40	0 51	2 33	23 5	4.0	9 26	.0
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 30.0	-.1	15.8	$T_{\overline{m}}$ 3 40	1.9	57.2	15.6
12	- 6 30.6	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 19.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 58	.1	225	-3.8	♃	22 60	.0	73	-2.6
♂	14 53	.1	195	1.7	♄	14 30	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.1	19 49.9	302 5.0	165 24.3	18 1.7	136 57.3	7 19.1
2	208 22.1	19 48.9	332 9.9	195 23.0	18 .0	166 59.4	7 17.9
4	238 22.1	19 47.8	2 14.8	225 21.7	17 58.3	197 1.5	7 16.7
6	268 22.1	19 46.7	32 19.8	255 20.4	17 56.6	227 3.6	7 15.4
8	298 22.0	19 45.7	62 24.7	285 19.2	17 54.9	257 5.7	7 14.2
10	328 22.0	19 44.6	92 29.6	315 17.9	17 53.1	287 7.8	7 13.0
12	358 22.0	19 43.6	122 34.5	345 16.6	17 51.4	317 9.8	7 11.8
14	28 22.0	19 42.5	152 39.5	15 15.4	17 49.6	347 11.9	7 10.5
16	58 22.0	19 41.4	182 44.4	45 14.1	17 47.9	17 14.0	7 9.3
18	88 22.0	19 40.3	212 49.3	75 12.8	17 46.2	47 16.1	7 8.1
20	118 22.0	19 39.3	242 54.3	105 11.6	17 44.4	77 18.2	7 6.8
22	148 21.9	19 38.2	272 59.2	135 10.3	17 42.7	107 20.3	7 5.6
Δ	0	-5		-6	-9	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	295 40.1	131	7 10.6	151	15 6.2	-22 45.0	142 54.0	10 33.1
2	324 44.2	129	7 40.8	151	45 11.8	-22 45.1	172 58.4	10 32.9
4	353 48.1	128	8 11.0	150	75 17.4	-22 45.2	203 2.8	10 32.7
6	22 51.7	127	8 41.1	150	105 22.9	-22 45.3	233 7.2	10 32.5
8	51 55.1	126	9 11.0	149	135 28.5	-22 45.3	263 11.6	10 32.3
10	80 58.2	124	9 40.8	148	165 34.1	-22 45.4	293 16.0	10 32.1
12	110 1.0	123	10 10.5	148	195 39.6	-22 45.5	323 20.4	10 31.9
14	139 3.6	121	10 40.1	147	225 45.2	-22 45.6	353 24.8	10 31.6
16	168 5.8	120	11 9.4	146	255 50.8	-22 45.7	23 29.2	10 31.4
18	197 7.7	118	11 38.6	145	285 56.3	-22 45.7	53 33.6	10 31.2
20	226 9.3	116	12 7.6	144	316 1.9	-22 45.8	83 38.0	10 31.0
22	255 10.6	115	12 36.4	143	346 7.5	-22 45.9	113 42.4	10 30.8
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 23	20 48	1 7	: ::	21 29	.1	11 51	4.1
55	3 56	20 16	0 49	: ::	21 45	.5	11 37	3.7
50	4 19	19 53	0 40	2 50	21 58	.8	11 27	3.4
45	4 37	19 36	0 35	2 12	22 8	1.0	11 18	3.2
40	4 51	19 21	0 31	1 52	22 17	1.2	11 12	3.0
35	5 4	19 9	0 28	1 40	22 24	1.4	11 6	2.8
30	5 14	18 58	0 26	1 31	22 31	1.5	11 1	2.7
20	5 33	18 40	0 24	1 21	22 42	1.7	10 52	2.4
10	5 48	18 25	0 22	1 15	22 52	1.9	10 44	2.2
0	6 3	18 10	0 22	1 13	23 2	2.1	10 37	2.0
10	6 17	17 56	0 22	1 14	23 11	2.3	10 30	1.8
20	6 33	17 40	0 23	1 17	23 22	2.5	10 22	1.6
30	6 50	17 23	0 26	1 23	23 34	2.7	10 13	1.4
35	7 0	17 13	0 27	1 28	23 40	2.9	10 8	1.3
40	7 12	17 1	0 29	1 35	23 48	3.0	10 3	1.1
45	7 25	16 48	0 32	1 43	23 57	3.2	9 56	.9
50	7 42	16 32	0 36	1 54	.. ..	.0	9 48	.7
55	8 3	16 11	0 42	2 10	.. ..	.0	9 39	.4
60	8 31	15 42	0 51	2 33	.. ..	.0	9 26	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 31.3	.0	15.8	$T_{\overline{m}}$ 4 26	2.0	57.8	15.8
12	- 6 31.7	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 20.9 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 59	.1	223	-3.8	♃	22 55	.0	73	-2.6
♂	14 51	.1	195	1.7	♄	14 26	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.9	19 37.1	303 4.1	165 9.1	17 40.9	137 22.4	7 4.4
2	208 21.9	19 36.0	333 9.0	195 7.8	17 39.1	167 24.5	7 3.1
4	238 21.9	19 34.9	3 14.0	225 6.6	17 37.4	197 26.6	7 1.9
6	268 21.9	19 33.9	33 18.9	255 5.3	17 35.6	227 28.7	7 .7
8	298 21.9	19 32.8	63 23.8	285 4.1	17 33.9	257 30.8	6 59.4
10	328 21.9	19 31.7	93 28.8	315 2.8	17 32.1	287 32.9	6 58.2
12	358 21.9	19 30.6	123 33.7	345 1.6	17 30.3	317 34.9	6 57.0
14	28 21.9	19 29.5	153 38.6	15 .4	17 28.5	347 37.0	6 55.7
16	58 21.9	19 28.4	183 43.5	44 59.1	17 26.7	17 39.1	6 54.5
18	88 21.9	19 27.3	213 48.5	74 57.9	17 25.0	47 41.2	6 53.3
20	118 21.9	19 26.2	243 53.4	104 56.7	17 23.2	77 43.3	6 52.0
22	148 21.9	19 25.1	273 58.3	134 55.4	17 21.4	107 45.4	6 50.8
Δ	0	-5		-6	-9	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	284 11.6	113	13 5.1	142	16 13.0	-22 46.0	143 46.8	10 30.6
2	313 12.1	111	13 33.4	141	46 18.6	-22 46.1	173 51.3	10 30.4
4	342 12.4	109	14 1.6	140	76 24.2	-22 46.1	203 55.7	10 30.2
6	11 12.3	107	14 29.5	138	106 29.7	-22 46.2	234 .1	10 30.0
8	40 11.8	106	14 57.2	137	136 35.3	-22 46.3	264 4.5	10 29.8
10	69 10.9	104	15 24.6	136	166 40.8	-22 46.4	294 8.9	10 29.5
12	98 9.6	102	15 51.7	134	196 46.4	-22 46.4	324 13.3	10 29.3
14	127 7.9	100	16 18.5	133	226 51.9	-22 46.5	354 17.7	10 29.1
16	156 5.8	97	16 45.0	131	256 57.5	-22 46.6	24 22.1	10 28.9
18	185 3.3	95	17 11.2	129	287 3.1	-22 46.7	54 26.5	10 28.7
20	214 .4	93	17 37.0	128	317 8.6	-22 46.7	84 30.9	10 28.5
22	242 57.0	91	18 2.5	126	347 14.2	-22 46.8	114 35.3	10 28.3
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 25	20 46	1 6	: ::	21 32	.3	13 30	4.4
55	3 57	20 15	0 48	: ::	21 58	.8	13 6	3.9
50	4 20	19 52	0 40	2 48	22 18	1.1	12 48	3.5
45	4 38	19 35	0 35	2 11	22 33	1.3	12 34	3.3
40	4 52	19 20	0 31	1 52	22 46	1.5	12 23	3.1
35	5 4	19 8	0 28	1 40	22 58	1.6	12 13	2.9
30	5 15	18 58	0 26	1 31	23 7	1.8	12 5	2.8
20	5 33	18 40	0 24	1 21	23 24	2.0	11 50	2.6
10	5 49	18 24	0 22	1 15	23 39	2.2	11 37	2.4
0	6 3	18 10	0 22	1 13	23 53	2.3	11 26	2.2
10	6 17	17 56	0 22	1 13	. . ..	.0	11 14	2.0
20	6 32	17 41	0 23	1 17	. . ..	.0	11 1	1.8
30	6 50	17 24	0 26	1 23	. . ..	.0	10 47	1.6
35	6 60	17 14	0 27	1 28	. . ..	.0	10 39	1.5
40	7 11	17 2	0 29	1 34	. . ..	.0	10 30	1.3
45	7 24	16 49	0 32	1 43	. . ..	.0	10 19	1.2
50	7 41	16 33	0 36	1 54	0 9	3.5	10 6	.9
55	8 1	16 12	0 42	2 10	0 24	3.8	9 49	.6
60	8 29	15 44	0 50	2 32	0 43	4.3	9 28	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 32.1	.0	15.8	$T_{\overline{m}}$ 5 14	2.2	58.4	15.9
12	- 6 32.2	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 21.9 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	12 60	.1	222	-3.8	♃	22 51	.0	73	-2.6
♂	14 49	.1	194	1.7	♄	14 23	.0	201	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 21.9	19 24.0	304 3.3	164 54.2	17 19.6	137 47.5	6 49.6
2	208 21.9	19 22.9	334 8.2	194 53.0	17 17.8	167 49.6	6 48.3
4	238 21.9	19 21.7	4 13.1	224 51.7	17 16.0	197 51.7	6 47.1
6	268 21.9	19 20.6	34 18.0	254 50.5	17 14.2	227 53.8	6 45.8
8	298 21.9	19 19.5	64 23.0	284 49.3	17 12.4	257 55.8	6 44.6
10	328 21.9	19 18.4	94 27.9	314 48.1	17 10.6	287 57.9	6 43.4
12	358 21.9	19 17.3	124 32.8	344 46.9	17 8.7	318 .0	6 42.1
14	28 21.9	19 16.2	154 37.8	14 45.7	17 6.9	348 2.1	6 40.9
16	58 21.9	19 15.0	184 42.7	44 44.4	17 5.1	18 4.2	6 39.6
18	88 21.9	19 13.9	214 47.6	74 43.2	17 3.3	48 6.3	6 38.4
20	118 22.0	19 12.8	244 52.5	104 42.0	17 1.4	78 8.4	6 37.2
22	148 22.0	19 11.6	274 57.5	134 40.8	16 59.6	108 10.5	6 35.9
Δ	0	-6		-6	-9	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	271 53.2	89	18 27.7	124	17 19.7	-22 46.9	144 39.7	10 28.1
2	300 49.0	87	18 52.4	122	47 25.3	-22 47.0	174 44.1	10 27.9
4	329 44.3	84	19 16.8	120	77 30.8	-22 47.1	204 48.5	10 27.7
6	358 39.2	82	19 40.8	118	107 36.4	-22 47.1	234 52.9	10 27.4
8	27 33.6	80	20 4.3	116	137 41.9	-22 47.2	264 57.3	10 27.2
10	56 27.6	78	20 27.4	113	167 47.5	-22 47.3	295 1.7	10 27.0
12	85 21.1	75	20 50.1	111	197 53.0	-22 47.4	325 6.1	10 26.8
14	114 14.1	73	21 12.3	109	227 58.6	-22 47.4	355 10.5	10 26.6
16	143 6.7	71	21 34.0	106	258 4.1	-22 47.5	25 14.9	10 26.4
18	171 58.8	68	21 55.2	104	288 9.7	-22 47.6	55 19.3	10 26.2
20	200 50.5	66	22 15.9	101	318 15.2	-22 47.7	85 23.7	10 26.0
22	229 41.6	64	22 36.1	98	348 20.8	-22 47.7	115 28.1	10 25.7
Δ					28	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 27	20 44	1 5	: ::	21 38	.6	15 15	4.5
55	3 59	20 13	0 48	: ::	22 17	1.2	14 39	3.9
50	4 21	19 51	0 40	2 46	22 44	1.5	14 13	3.5
45	4 39	19 33	0 34	2 10	23 5	1.7	13 53	3.3
40	4 53	19 19	0 31	1 51	23 22	1.9	13 37	3.1
35	5 5	19 8	0 28	1 39	23 37	2.0	13 24	3.0
30	5 16	18 57	0 26	1 31	23 50	2.1	13 12	2.9
20	5 33	18 39	0 24	1 20	. . ..	.0	12 52	2.7
10	5 49	18 24	0 22	1 15	. . ..	.0	12 35	2.6
0	6 3	18 10	0 22	1 13	. . ..	.0	12 19	2.4
10	6 17	17 56	0 22	1 13	0 7	2.5	12 3	2.3
20	6 32	17 41	0 23	1 17	0 22	2.7	11 46	2.1
30	6 49	17 24	0 25	1 23	0 39	2.9	11 26	1.9
35	6 59	17 14	0 27	1 28	0 50	3.0	11 15	1.8
40	7 10	17 3	0 29	1 34	1 2	3.1	11 2	1.7
45	7 23	16 50	0 32	1 43	1 15	3.3	10 47	1.5
50	7 39	16 34	0 36	1 54	1 33	3.6	10 28	1.3
55	7 60	16 14	0 41	2 9	1 55	3.9	10 4	.9
60	8 27	15 46	0 50	2 32	2 26	4.5	9 32	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 6 32.3	.0	15.8	$T_{\overline{m}}$ 6 6	2.3	58.9	16.1
12	- 6 32.1	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 22.9 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 1	.1	221	-3.8	♃	22 46	.0	73	-2.6
♂	14 48	.1	194	1.7	♄	14 19	.0	201	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.0	19 10.5	305 2.4	164 39.6	16 57.8	138 12.6	6 34.7
2	208 22.0	19 9.4	335 7.3	194 38.4	16 55.9	168 14.7	6 33.4
4	238 22.0	19 8.2	5 12.2	224 37.2	16 54.1	198 16.7	6 32.2
6	268 22.0	19 7.1	35 17.2	254 36.0	16 52.3	228 18.8	6 31.0
8	298 22.0	19 5.9	65 22.1	284 34.8	16 50.4	258 20.9	6 29.7
10	328 22.1	19 4.8	95 27.0	314 33.6	16 48.6	288 23.0	6 28.5
12	358 22.1	19 3.7	125 32.0	344 32.4	16 46.7	318 25.1	6 27.2
14	28 22.1	19 2.5	155 36.9	14 31.2	16 44.8	348 27.2	6 26.0
16	58 22.1	19 1.3	185 41.8	44 30.1	16 43.0	18 29.3	6 24.7
18	88 22.1	19 .2	215 46.7	74 28.9	16 41.1	48 31.4	6 23.5
20	118 22.2	18 59.0	245 51.7	104 27.7	16 39.3	78 33.4	6 22.2
22	148 22.2	18 57.9	275 56.6	134 26.5	16 37.4	108 35.5	6 21.0
Δ	0	−6		−6	−9	10	−6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	258 32.4	61	22 55.8	96	18 26.3	−22 47.8	145 32.5	10 25.5
2	287 22.6	59	23 14.9	93	48 31.9	−22 47.9	175 36.9	10 25.3
4	316 12.4	57	23 33.5	90	78 37.4	−22 48.0	205 41.3	10 25.1
6	345 1.8	54	23 51.4	87	108 43.0	−22 48.0	235 45.7	10 24.9
8	13 50.7	52	24 8.8	84	138 48.5	−22 48.1	265 50.1	10 24.7
10	42 39.1	50	24 25.6	81	168 54.1	−22 48.2	295 54.5	10 24.5
12	71 27.2	48	24 41.7	78	198 59.6	−22 48.3	325 58.8	10 24.3
14	100 14.7	46	24 57.2	74	229 5.2	−22 48.3	356 3.2	10 24.0
16	129 1.9	44	25 12.1	71	259 10.7	−22 48.4	26 7.6	10 23.8
18	157 48.7	42	25 26.3	68	289 16.2	−22 48.5	56 12.0	10 23.6
20	186 35.1	40	25 39.8	64	319 21.8	−22 48.6	86 16.4	10 23.4
22	215 21.1	38	25 52.6	61	349 27.3	−22 48.6	116 20.8	10 23.2
Δ					28	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 30	20 42	1 4	: : :	21 52	1.4	17 4	4.1
55	4 1	20 11	0 48	: : :	22 46	2.0	16 12	3.5
50	4 23	19 49	0 39	2 44	23 21	2.2	15 38	3.3
45	4 40	19 32	0 34	2 9	23 47	2.3	15 13	3.1
40	4 54	19 18	0 31	1 51	. . . .	.0	14 53	3.0
35	5 6	19 7	0 28	1 39	. . . .	.0	14 36	3.0
30	5 16	18 57	0 26	1 31	. . . .	.0	14 22	2.9
20	5 34	18 39	0 24	1 20	0 12	2.3	13 57	2.8
10	5 49	18 24	0 22	1 15	0 31	2.4	13 36	2.7
0	6 3	18 10	0 22	1 13	0 48	2.5	13 17	2.6
10	6 17	17 56	0 22	1 13	1 6	2.6	12 57	2.5
20	6 32	17 41	0 23	1 16	1 26	2.8	12 36	2.4
30	6 49	17 25	0 25	1 23	1 48	2.9	12 12	2.3
35	6 58	17 15	0 27	1 28	2 1	3.0	11 58	2.2
40	7 9	17 4	0 29	1 34	2 17	3.1	11 42	2.1
45	7 22	16 51	0 32	1 42	2 35	3.3	11 23	2.0
50	7 38	16 35	0 36	1 54	2 58	3.5	10 58	1.8
55	7 58	16 16	0 41	2 9	3 29	3.8	10 27	1.5
60	8 25	15 49	0 50	2 31	4 15	4.5	9 40	.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′		h min	min	′	′
00	− 6 31.9	.0	15.8	$T_{\overline{m}}$	7 2	2.6	59.4	16.2
12	− 6 31.4	$T_{\overline{m}_\odot}$ 12 h	6.5 min	Starost 23.9 d	Faza ◑			

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 2	.1	220	−3.8	♃	22 42	.0	73	−2.5
♂	14 46	.1	193	1.7	♄	14 16	.0	200	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.2	18 56.7	306 1.5	164 25.3	16 35.5	138 37.6	6 19.8
2	208 22.2	18 55.6	336 6.5	194 24.1	16 33.6	168 39.7	6 18.5
4	238 22.3	18 54.4	6 11.4	224 23.0	16 31.8	198 41.8	6 17.3
6	268 22.3	18 53.2	36 16.3	254 21.8	16 29.9	228 43.9	6 16.0
8	298 22.3	18 52.1	66 21.2	284 20.6	16 28.0	258 46.0	6 14.8
10	328 22.4	18 50.9	96 26.2	314 19.5	16 26.1	288 48.1	6 13.5
12	358 22.4	18 49.7	126 31.1	344 18.3	16 24.2	318 50.1	6 12.3
14	28 22.4	18 48.5	156 36.0	14 17.1	16 22.3	348 52.2	6 11.0
16	58 22.5	18 47.4	186 41.0	44 16.0	16 20.4	18 54.3	6 9.8
18	88 22.5	18 46.2	216 45.9	74 14.8	16 18.5	48 56.4	6 8.5
20	118 22.5	18 45.0	246 50.8	104 13.6	16 16.6	78 58.5	6 7.3
22	148 22.6	18 43.8	276 55.7	134 12.5	16 14.7	109 .6	6 6.0
Δ	0	−6		−6	−9	10	−6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	244 6.7	36	26 4.7	57	19 32.9	−22 48.7	146 25.2	10 23.0
2	272 52.0	35	26 16.1	53	49 38.4	−22 48.8	176 29.6	10 22.8
4	301 36.9	33	26 26.8	50	79 43.9	−22 48.9	206 34.0	10 22.6
6	330 21.5	31	26 36.8	46	109 49.5	−22 48.9	236 38.4	10 22.3
8	359 5.8	30	26 46.0	42	139 55.0	−22 49.0	266 42.8	10 22.1
10	27 49.8	29	26 54.4	38	170 .5	−22 49.1	296 47.2	10 21.9
12	56 33.5	27	27 2.1	35	200 6.1	−22 49.2	326 51.6	10 21.7
14	85 17.0	26	27 9.1	31	230 11.6	−22 49.2	356 56.0	10 21.5
16	114 .3	25	27 15.2	27	260 17.1	−22 49.3	27 .4	10 21.3
18	142 43.3	24	27 20.6	23	290 22.7	−22 49.4	57 4.8	10 21.1
20	171 26.2	23	27 25.1	19	320 28.2	−22 49.5	87 9.1	10 20.8
22	200 8.8	23	27 28.9	15	350 33.7	−22 49.5	117 13.5	10 20.6
Δ					28	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 32	20 39	1 3	: : :	22 26	3.0	18 43	2.6
55	4 2	20 10	0 47	: : :	23 33	2.9	17 36	2.7
50	4 24	19 48	0 39	2 41	. . . .	.0	16 57	2.7
45	4 41	19 31	0 34	2 8	. . . .	.0	16 28	2.7
40	4 55	19 18	0 31	1 50	0 8	2.4	16 6	2.7
35	5 7	19 6	0 28	1 38	0 25	2.4	15 47	2.7
30	5 17	18 56	0 26	1 30	0 40	2.5	15 31	2.7
20	5 34	18 39	0 24	1 20	1 6	2.6	15 4	2.7
10	5 49	18 24	0 22	1 15	1 28	2.6	14 41	2.7
0	6 3	18 10	0 22	1 13	1 49	2.7	14 19	2.7
10	6 17	17 56	0 22	1 13	2 10	2.7	13 57	2.7
20	6 31	17 42	0 23	1 16	2 32	2.8	13 34	2.7
30	6 48	17 25	0 25	1 23	2 58	2.8	13 7	2.6
35	6 58	17 16	0 27	1 28	3 14	2.9	12 51	2.6
40	7 8	17 5	0 29	1 34	3 32	2.9	12 33	2.6
45	7 21	16 52	0 32	1 42	3 54	3.0	12 10	2.6
50	7 37	16 37	0 36	1 53	4 22	3.0	11 42	2.5
55	7 56	16 17	0 41	2 9	4 60	3.2	11 3	2.4
60	8 23	15 51	0 49	2 31	6 3	3.5	9 60	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′		h min	min	′	′
00	− 6 30.9	.1	15.8	$T_{\overline{m}}$	8 4	2.7	59.9	16.3
12	− 6 30.2	$T_{\overline{m}_\odot}$ 12 h	6.5 min	Starost 24.9 d	Faza ◑			

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 3	.1	218	−3.8	♃	22 38	.0	74	−2.5
♂	14 44	.1	193	1.7	♄	14 12	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 22.6	18 42.6	307 .7	164 11.3	16 12.8	139 2.7	6 4.8
2	208 22.6	18 41.4	337 5.6	194 10.2	16 10.9	169 4.7	6 3.5
4	238 22.7	18 40.2	7 10.5	224 9.0	16 9.0	199 6.8	6 2.3
6	268 22.7	18 39.1	37 15.5	254 7.9	16 7.1	229 8.9	6 1.0
8	298 22.8	18 37.9	67 20.4	284 6.7	16 5.1	259 11.0	5 59.8
10	328 22.8	18 36.7	97 25.3	314 5.6	16 3.2	289 13.1	5 58.5
12	358 22.9	18 35.5	127 30.2	344 4.4	16 1.3	319 15.2	5 57.3
14	28 22.9	18 34.3	157 35.2	14 3.3	15 59.3	349 17.3	5 56.0
16	58 22.9	18 33.1	187 40.1	44 2.1	15 57.4	19 19.3	5 54.8
18	88 23.0	18 31.8	217 45.0	74 1.0	15 55.5	49 21.4	5 53.5
20	118 23.0	18 30.6	247 50.0	103 59.9	15 53.5	79 23.5	5 52.3
22	148 23.1	18 29.4	277 54.9	133 58.7	15 51.6	109 25.6	5 51.0
Δ	0	−6		−6	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 51.4	22	27 31.8	11	20 39.3	−22 49.6	147 17.9	10 20.4
2	257 33.8	22	27 34.0	7	50 44.8	−22 49.7	177 22.3	10 20.2
4	286 16.1	21	27 35.3	3	80 50.3	−22 49.7	207 26.7	10 20.0
6	314 58.4	21	27 35.8	−1	110 55.9	−22 49.8	237 31.1	10 19.8
8	343 40.6	21	27 35.5	−6	141 1.4	−22 49.9	267 35.5	10 19.5
10	12 22.7	21	27 34.4	−10	171 6.9	−22 50.0	297 39.9	10 19.3
12	41 4.9	21	27 32.5	−14	201 12.4	−22 50.0	327 44.3	10 19.1
14	69 47.1	21	27 29.7	−18	231 18.0	−22 50.1	357 48.7	10 18.9
16	98 29.3	22	27 26.1	−22	261 23.5	−22 50.2	27 53.1	10 18.7
18	127 11.7	22	27 21.7	−26	291 29.0	−22 50.2	57 57.4	10 18.5
20	155 54.1	23	27 16.6	−30	321 34.5	−22 50.3	88 1.8	10 18.3
22	184 36.6	23	27 10.5	−34	351 40.1	−22 50.4	118 6.2	10 18.0
Δ					28	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 34	20 37	1 2	: ::	23 39	4.3	19 46	1.1
55	4 4	20 8	0 47	: ::	. . .	.0	18 41	1.8
50	4 26	19 47	0 39	2 39	0 13	2.9	18 2	2.0
45	4 42	19 30	0 34	2 7	0 42	2.9	17 34	2.2
40	4 56	19 17	0 30	1 50	1 5	2.8	17 11	2.3
35	5 7	19 5	0 28	1 38	1 23	2.8	16 52	2.4
30	5 17	18 55	0 26	1 30	1 40	2.8	16 36	2.4
20	5 34	18 38	0 24	1 20	2 7	2.8	16 9	2.5
10	5 49	18 24	0 22	1 15	2 31	2.7	15 46	2.6
0	6 3	18 10	0 22	1 13	2 53	2.7	15 24	2.7
10	6 17	17 56	0 22	1 13	3 15	2.7	15 2	2.7
20	6 31	17 42	0 23	1 16	3 39	2.6	14 38	2.8
30	6 47	17 26	0 25	1 23	4 6	2.6	14 10	2.9
35	6 57	17 17	0 27	1 27	4 23	2.6	13 54	3.0
40	7 7	17 6	0 29	1 34	4 42	2.5	13 35	3.0
45	7 20	16 53	0 32	1 42	5 5	2.5	13 12	3.1
50	7 35	16 38	0 36	1 53	5 35	2.4	12 42	3.2
55	7 55	16 19	0 41	2 8	6 16	2.2	12 1	3.4
60	8 21	15 53	0 49	2 30	7 27	1.8	10 50	3.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 29.4	.1	15.8	$T_{\overline{m}}$ 9 8	2.7	60.2	16.4
12	− 6 28.3	$T_{\overline{m}_\odot}$ 12 h 6.5 min		Starost 25.9 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 4	.1	217	−3.8	♃	22 33	.0	74	−2.5
♂	14 43	.1	192	1.7	♄	14 9	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.1	18 28.2	307 59.8	163 57.6	15 49.6	139 27.7	5 49.8
2	208 23.2	18 27.0	338 4.7	193 56.5	15 47.7	169 29.8	5 48.5
4	238 23.2	18 25.8	8 9.7	223 55.4	15 45.7	199 31.9	5 47.2
6	268 23.3	18 24.6	38 14.6	253 54.2	15 43.8	229 33.9	5 46.0
8	298 23.3	18 23.3	68 19.5	283 53.1	15 41.8	259 36.0	5 44.7
10	328 23.4	18 22.1	98 24.5	313 52.0	15 39.9	289 38.1	5 43.5
12	358 23.5	18 20.9	128 29.4	343 50.9	15 37.9	319 40.2	5 42.2
14	28 23.5	18 19.7	158 34.3	13 49.7	15 35.9	349 42.3	5 41.0
16	58 23.6	18 18.4	188 39.2	43 48.6	15 34.0	19 44.4	5 39.7
18	88 23.6	18 17.2	218 44.2	73 47.5	15 32.0	49 46.4	5 38.4
20	118 23.7	18 16.0	248 49.1	103 46.4	15 30.0	79 48.5	5 37.2
22	148 23.8	18 14.7	278 54.0	133 45.3	15 28.0	109 50.6	5 35.9
Δ	0	−6		−6	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	213 19.3	24	27 3.7	−38	21 45.6	−22 50.5	148 10.6	10 17.8
2	242 2.2	25	26 56.1	−42	51 51.1	−22 50.5	178 15.0	10 17.6
4	270 45.2	26	26 47.7	−46	81 56.6	−22 50.6	208 19.4	10 17.4
6	299 28.4	27	26 38.6	−50	112 2.1	−22 50.7	238 23.8	10 17.2
8	328 11.9	29	26 28.6	−54	142 7.7	−22 50.7	268 28.2	10 17.0
10	356 55.6	30	26 17.9	−57	172 13.2	−22 50.8	298 32.6	10 16.7
12	25 39.7	31	26 6.4	−61	202 18.7	−22 50.9	328 36.9	10 16.5
14	54 23.9	33	25 54.2	−65	232 24.2	−22 51.0	358 41.3	10 16.3
16	83 8.6	35	25 41.2	−68	262 29.7	−22 51.0	28 45.7	10 16.1
18	111 53.5	36	25 27.6	−72	292 35.2	−22 51.1	58 50.1	10 15.9
20	140 38.7	38	25 13.2	−75	322 40.7	−22 51.2	88 54.5	10 15.7
22	169 24.4	40	24 58.1	−79	352 46.3	−22 51.2	118 58.9	10 15.4
Δ					28	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 37	20 35	1 1	: ::	. . .	.0	20 13	.5
55	4 6	20 6	0 47	: ::	0 44	3.7	19 24	1.1
50	4 27	19 45	0 39	2 37	1 22	3.4	18 51	1.4
45	4 43	19 29	0 34	2 6	1 50	3.3	18 26	1.7
40	4 57	19 16	0 30	1 49	2 13	3.1	18 6	1.8
35	5 8	19 4	0 28	1 38	2 31	3.0	17 49	2.0
30	5 18	18 55	0 26	1 30	2 47	3.0	17 34	2.1
20	5 35	18 38	0 24	1 20	3 13	2.8	17 10	2.2
10	5 49	18 23	0 22	1 15	3 36	2.7	16 48	2.4
0	6 3	18 10	0 22	1 12	3 58	2.6	16 28	2.5
10	6 16	17 57	0 22	1 13	4 19	2.5	16 8	2.7
20	6 31	17 43	0 23	1 16	4 42	2.4	15 46	2.8
30	6 47	17 27	0 25	1 23	5 8	2.2	15 20	3.0
35	6 56	17 17	0 27	1 27	5 24	2.1	15 5	3.1
40	7 7	17 7	0 29	1 34	5 42	2.0	14 48	3.2
45	7 19	16 54	0 32	1 42	6 4	1.9	14 26	3.4
50	7 34	16 39	0 35	1 53	6 31	1.7	13 60	3.6
55	7 53	16 21	0 41	2 8	7 9	1.4	13 23	3.9
60	8 19	15 55	0 49	2 29	8 9	.7	12 24	4.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 6 27.3	.1	15.8	$T_{\overline{m}}$ 10 13	2.6	60.3	16.4
12	− 6 25.9	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 26.9 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 5	.1	216	−3.8	♃	22 29	.0	74	−2.5
♂	14 41	.1	191	1.7	♄	14 5	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 23.8	18 13.5	308 58.9	163 44.2	15 26.1	139 52.7	5 34.7
2	208 23.9	18 12.3	339 3.9	193 43.1	15 24.1	169 54.8	5 33.4
4	238 23.9	18 11.0	9 8.8	223 42.0	15 22.1	199 56.9	5 32.2
6	268 24.0	18 9.8	39 13.7	253 40.9	15 20.1	229 58.9	5 30.9
8	298 24.1	18 8.5	69 18.7	283 39.8	15 18.1	260 1.0	5 29.6
10	328 24.1	18 7.3	99 23.6	313 38.7	15 16.1	290 3.1	5 28.4
12	358 24.2	18 6.0	129 28.5	343 37.6	15 14.1	320 5.2	5 27.1
14	28 24.3	18 4.8	159 33.4	13 36.5	15 12.1	350 7.3	5 25.9
16	58 24.4	18 3.5	189 38.4	43 35.4	15 10.1	20 9.3	5 24.6
18	88 24.4	18 2.3	219 43.3	73 34.3	15 8.1	50 11.4	5 23.3
20	118 24.5	18 1.0	249 48.2	103 33.2	15 6.1	80 13.5	5 22.1
22	148 24.6	17 59.8	279 53.2	133 32.1	15 4.1	110 15.6	5 20.8
Δ	0	−6		−5	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 10.4	42	24 42.3	−82	22 51.8	−22 51.3	149 3.3	10 15.2
2	226 56.8	44	24 25.8	−86	52 57.3	−22 51.4	179 7.6	10 15.0
4	255 43.5	46	24 8.7	−89	83 2.8	−22 51.4	209 12.0	10 14.8
6	284 30.7	48	23 50.9	−92	113 8.3	−22 51.5	239 16.4	10 14.6
8	313 18.3	50	23 32.5	−95	143 13.8	−22 51.6	269 20.8	10 14.4
10	342 6.3	52	23 13.4	−98	173 19.3	−22 51.7	299 25.2	10 14.1
12	10 54.8	55	22 53.8	−101	203 24.8	−22 51.7	329 29.6	10 13.9
14	39 43.7	57	22 33.6	−104	233 30.3	−22 51.8	359 34.0	10 13.7
16	68 33.1	59	22 12.8	−107	263 35.8	−22 51.9	29 38.3	10 13.5
18	97 22.9	61	21 51.4	−109	293 41.3	−22 51.9	59 42.7	10 13.3
20	126 13.1	64	21 29.5	−112	323 46.8	−22 52.0	89 47.1	10 13.0
22	155 3.9	66	21 7.1	−115	353 52.3	−22 52.1	119 51.5	10 12.8
Δ					28	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 39	20 32	1 0	: : :	1 25	4.7	20 25	.2
55	4 8	20 4	0 46	: : :	2 13	4.0	19 50	.7
50	4 28	19 44	0 39	2 36	2 45	3.7	19 25	1.0
45	4 44	19 28	0 34	2 5	3 9	3.4	19 5	1.3
40	4 58	19 15	0 30	1 49	3 28	3.2	18 49	1.5
35	5 9	19 3	0 28	1 37	3 44	3.1	18 36	1.6
30	5 19	18 54	0 26	1 30	3 58	3.0	18 24	1.7
20	5 35	18 37	0 23	1 20	4 21	2.8	18 3	2.0
10	5 50	18 23	0 22	1 14	4 41	2.6	17 45	2.2
0	6 3	18 10	0 22	1 12	5 0	2.4	17 29	2.3
10	6 16	17 57	0 22	1 13	5 19	2.3	17 12	2.5
20	6 30	17 43	0 23	1 16	5 39	2.1	16 53	2.7
30	6 46	17 27	0 25	1 22	6 2	1.9	16 32	2.9
35	6 55	17 18	0 27	1 27	6 16	1.8	16 19	3.1
40	7 6	17 8	0 29	1 33	6 31	1.6	16 5	3.2
45	7 18	16 56	0 32	1 42	6 49	1.4	15 48	3.4
50	7 32	16 41	0 35	1 53	7 12	1.2	15 26	3.7
55	7 51	16 22	0 41	2 7	7 42	.9	14 58	4.0
60	8 16	15 57	0 49	2 29	8 25	.3	14 16	4.6
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 6 24.5	.1	15.8	$T_{\overline{m}}$	11 15	2.4	60.1	16.4
12	− 6 22.9	$T_{\overline{m}_\odot}$ 12 h 6.4 min		Starost 27.9 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 6	.1	215	−3.8	♆	22 24	.0	74	−2.5
♂	14 39	.1	191	1.7	♄	14 2	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 24.7	17 58.5	309 58.1	163 31.1	15 2.1	140 17.7	5 19.6
2	208 24.7	17 57.2	340 3.0	193 30.0	15 .0	170 19.7	5 18.3
4	238 24.8	17 56.0	10 7.9	223 28.9	14 58.0	200 21.8	5 17.0
6	268 24.9	17 54.7	40 12.9	253 27.8	14 56.0	230 23.9	5 15.8
8	298 25.0	17 53.4	70 17.8	283 26.7	14 54.0	260 26.0	5 14.5
10	328 25.0	17 52.2	100 22.7	313 25.7	14 51.9	290 28.1	5 13.2
12	358 25.1	17 50.9	130 27.7	343 24.6	14 49.9	320 30.1	5 12.0
14	28 25.2	17 49.6	160 32.6	13 23.5	14 47.9	350 32.2	5 10.7
16	58 25.3	17 48.3	190 37.5	43 22.5	14 45.8	20 34.3	5 9.4
18	88 25.4	17 47.1	220 42.4	73 21.4	14 43.8	50 36.4	5 8.2
20	118 25.5	17 45.8	250 47.4	103 20.3	14 41.8	80 38.5	5 6.9
22	148 25.5	17 44.5	280 52.3	133 19.3	14 39.7	110 40.5	5 5.6
Δ	0	−6		−5	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	183 55.1	68	20 44.2	−117	23 57.8	−22 52.1	149 55.9	10 12.6
2	212 46.7	71	20 20.8	−119	54 3.4	−22 52.2	180 .3	10 12.4
4	241 38.9	73	19 56.9	−122	84 8.9	−22 52.3	210 4.6	10 12.2
6	270 31.5	75	19 32.5	−124	114 14.3	−22 52.3	240 9.0	10 12.0
8	299 24.5	78	19 7.7	−126	144 19.8	−22 52.4	270 13.4	10 11.7
10	328 18.0	80	18 42.5	−128	174 25.3	−22 52.5	300 17.8	10 11.5
12	357 12.0	82	18 16.9	−130	204 30.8	−22 52.5	330 22.2	10 11.3
14	26 6.5	85	17 50.8	−132	234 36.3	−22 52.6	0 26.5	10 11.1
16	55 1.4	87	17 24.4	−134	264 41.8	−22 52.7	30 30.9	10 10.9
18	83 56.8	89	16 57.7	−136	294 47.3	−22 52.7	60 35.3	10 10.6
20	112 52.6	91	16 30.6	−137	324 52.8	−22 52.8	90 39.7	10 10.4
22	141 48.8	93	16 3.1	−139	354 58.3	−22 52.9	120 44.1	10 10.2
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 41	20 30	0 60	: : :	3 17	4.5	20 30	.1
55	4 9	20 2	0 46	: : :	3 50	3.9	20 7	.5
50	4 30	19 42	0 38	2 34	4 13	3.6	19 50	.8
45	4 46	19 26	0 34	2 5	4 31	3.4	19 36	1.0
40	4 59	19 13	0 30	1 48	4 46	3.2	19 24	1.2
35	5 10	19 3	0 28	1 37	4 58	3.0	19 14	1.4
30	5 19	18 53	0 26	1 29	5 9	2.8	19 6	1.5
20	5 36	18 37	0 23	1 19	5 28	2.6	18 50	1.7
10	5 50	18 23	0 22	1 14	5 44	2.4	18 37	1.9
0	6 3	18 10	0 22	1 12	5 59	2.2	18 24	2.1
10	6 16	17 57	0 22	1 13	6 13	2.0	18 12	2.3
20	6 30	17 43	0 23	1 16	6 29	1.8	17 58	2.5
30	6 45	17 28	0 25	1 22	6 47	1.6	17 42	2.8
35	6 54	17 19	0 27	1 27	6 58	1.5	17 33	2.9
40	7 4	17 9	0 29	1 33	7 10	1.3	17 22	3.1
45	7 16	16 57	0 32	1 41	7 24	1.1	17 9	3.3
50	7 31	16 42	0 35	1 52	7 41	.9	16 54	3.5
55	7 49	16 24	0 40	2 7	8 3	.6	16 34	3.9
60	8 14	15 59	0 48	2 28	8 32	.1	16 7	4.3
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 6 21.2	.2	15.8	$T_{\overline{m}}$	12 12	2.2	59.8	16.3
12	− 6 19.2	$T_{\overline{m}_\odot}$ 12 h 6.3 min		Starost 28.9 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 6	.1	214	−3.8	♆	22 20	.0	74	−2.5
♂	14 38	.1	190	1.7	♄	13 58	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 25.6	17 43.2	310 57.2	163 18.2	14 37.7	140 42.6	5 4.4
2	208 25.7	17 41.9	341 2.2	193 17.1	14 35.6	170 44.7	5 3.1
4	238 25.8	17 40.6	11 7.1	223 16.1	14 33.6	200 46.8	5 1.9
6	268 25.9	17 39.3	41 12.0	253 15.0	14 31.5	230 48.9	5 .6
8	298 26.0	17 38.0	71 16.9	283 14.0	14 29.4	260 50.9	4 59.3
10	328 26.1	17 36.7	101 21.9	313 12.9	14 27.4	290 53.0	4 58.1
12	358 26.2	17 35.4	131 26.8	343 11.9	14 25.3	320 55.1	4 56.8
14	28 26.3	17 34.1	161 31.7	13 10.8	14 23.2	350 57.2	4 55.5
16	58 26.4	17 32.8	191 36.7	43 9.8	14 21.2	20 59.3	4 54.2
18	88 26.5	17 31.5	221 41.6	73 8.7	14 19.1	51 1.3	4 53.0
20	118 26.6	17 30.2	251 46.5	103 7.7	14 17.0	81 3.4	4 51.7
22	148 26.7	17 28.9	281 51.4	133 6.7	14 15.0	111 5.5	4 50.4
Δ	0	−6		−5	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	170 45.5	96	15 35.4	−140	25 3.8	−22 52.9	150 48.4	10 10.0
2	199 42.7	98	15 7.3	−142	55 9.3	−22 53.0	180 52.8	10 9.8
4	228 40.2	100	14 39.0	−143	85 14.8	−22 53.1	210 57.2	10 9.5
6	257 38.2	102	14 10.4	−144	115 20.3	−22 53.1	241 1.6	10 9.3
8	286 36.6	104	13 41.6	−145	145 25.8	−22 53.2	271 6.0	10 9.1
10	315 35.4	106	13 12.5	−147	175 31.2	−22 53.3	301 10.3	10 8.9
12	344 34.6	108	12 43.2	−148	205 36.7	−22 53.3	331 14.7	10 8.7
14	13 34.2	110	12 13.7	−149	235 42.2	−22 53.4	1 19.1	10 8.5
16	42 34.1	112	11 44.0	−149	265 47.7	−22 53.5	31 23.5	10 8.2
18	71 34.5	114	11 14.1	−150	295 53.2	−22 53.5	61 27.9	10 8.0
20	100 35.2	115	10 44.0	−151	325 58.7	−22 53.6	91 32.2	10 7.8
22	129 36.2	117	10 13.8	−152	356 4.2	−22 53.7	121 36.6	10 7.6
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 44	20 27	0 59	: ::	5 4	4.2	20 33	.1
55	4 11	20 0	0 46	: ::	5 24	3.7	20 19	.4
50	4 31	19 40	0 38	2 32	5 39	3.4	20 9	.7
45	4 47	19 25	0 33	2 4	5 52	3.2	20 0	.9
40	4 60	19 12	0 30	1 48	6 2	3.0	19 53	1.0
35	5 10	19 2	0 28	1 37	6 10	2.8	19 47	1.2
30	5 20	18 52	0 26	1 29	6 17	2.7	19 42	1.3
20	5 36	18 36	0 23	1 19	6 30	2.5	19 32	1.6
10	5 50	18 23	0 22	1 14	6 41	2.2	19 24	1.8
0	6 3	18 10	0 22	1 12	6 52	2.0	19 16	2.0
10	6 16	17 57	0 22	1 13	7 2	1.8	19 7	2.2
20	6 29	17 44	0 23	1 16	7 13	1.6	18 59	2.4
30	6 45	17 28	0 25	1 22	7 26	1.4	18 49	2.6
35	6 53	17 19	0 27	1 27	7 33	1.3	18 43	2.8
40	7 3	17 9	0 29	1 33	7 41	1.1	18 36	2.9
45	7 15	16 58	0 31	1 41	7 51	.9	18 28	3.1
50	7 29	16 44	0 35	1 52	8 2	.7	18 19	3.4
55	7 47	16 26	0 40	2 7	8 16	.4	18 7	3.6
60	8 12	16 2	0 48	2 28	8 35	.1	17 51	4.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min		min	′	′
00	− 6 17.3	.2	15.8	$T_{\overline{m}}$	13 4	2.0	59.2	16.1
12	− 6 15.0	$T_{\overline{m}_\odot}$ 12 h 6.3 min		Starost .6 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 7	.1	212	−3.8	♃	22 16	.0	74	−2.5
♂	14 36	.1	190	1.7	♄	13 55	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 26.8	17 27.6	311 56.4	163 5.6	14 12.9	141 7.6	4 49.2
2	208 26.9	17 26.3	342 1.3	193 4.6	14 10.8	171 9.6	4 47.9
4	238 27.0	17 25.0	12 6.2	223 3.6	14 8.7	201 11.7	4 46.6
6	268 27.1	17 23.7	42 11.1	253 2.5	14 6.6	231 13.8	4 45.4
8	298 27.2	17 22.4	72 16.1	283 1.5	14 4.5	261 15.9	4 44.1
10	328 27.3	17 21.0	102 21.0	313 .5	14 2.4	291 17.9	4 42.8
12	358 27.4	17 19.7	132 25.9	342 59.4	14 .3	321 20.0	4 41.5
14	28 27.5	17 18.4	162 30.9	12 58.4	13 58.2	351 22.1	4 40.3
16	58 27.6	17 17.1	192 35.8	42 57.4	13 56.1	21 24.2	4 39.0
18	88 27.7	17 15.7	222 40.7	72 56.4	13 54.0	51 26.2	4 37.7
20	118 27.8	17 14.4	252 45.6	102 55.4	13 51.9	81 28.3	4 36.5
22	148 28.0	17 13.1	282 50.6	132 54.4	13 49.8	111 30.4	4 35.2
Δ	1	−7		−5	−10	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	158 37.6	119	9 43.5	−152	26 9.6	−22 53.7	151 41.0	10 7.4
2	187 39.4	120	9 13.0	−153	56 15.1	−22 53.8	181 45.4	10 7.1
4	216 41.4	122	8 42.5	−153	86 20.6	−22 53.9	211 49.7	10 6.9
6	245 43.8	123	8 11.8	−154	116 26.1	−22 53.9	241 54.1	10 6.7
8	274 46.5	125	7 41.0	−154	146 31.5	−22 54.0	271 58.5	10 6.5
10	303 49.5	126	7 10.2	−155	176 37.0	−22 54.1	302 2.9	10 6.2
12	332 52.8	128	6 39.3	−155	206 42.5	−22 54.1	332 7.3	10 6.0
14	1 56.3	129	6 8.3	−155	236 48.0	−22 54.2	2 11.6	10 5.8
16	31 .2	130	5 37.3	−155	266 53.4	−22 54.2	32 16.0	10 5.6
18	60 4.3	132	5 6.3	−155	296 58.9	−22 54.3	62 20.4	10 5.4
20	89 8.6	133	4 35.3	−155	327 4.4	−22 54.4	92 24.8	10 5.1
22	118 13.2	134	4 4.2	−155	357 9.9	−22 54.4	122 29.1	10 4.9
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 46	20 25	0 58	: ::	6 44	3.9	20 34	.0
55	4 13	19 58	0 45	: ::	6 54	3.5	20 29	.3
50	4 33	19 39	0 38	2 30	7 2	3.3	20 24	.6
45	4 48	19 24	0 33	2 3	7 8	3.0	20 21	.8
40	5 0	19 11	0 30	1 47	7 14	2.9	20 18	1.0
35	5 11	19 1	0 28	1 36	7 18	2.7	20 16	1.1
30	5 20	18 52	0 26	1 29	7 22	2.6	20 14	1.2
20	5 36	18 36	0 23	1 19	7 29	2.3	20 10	1.5
10	5 50	18 22	0 22	1 14	7 35	2.1	20 6	1.7
0	6 3	18 10	0 22	1 12	7 41	1.9	20 3	1.9
10	6 15	17 57	0 22	1 13	7 47	1.7	19 60	2.1
20	6 29	17 44	0 23	1 16	7 53	1.5	19 56	2.3
30	6 44	17 29	0 25	1 22	7 59	1.3	19 52	2.5
35	6 52	17 20	0 27	1 27	8 3	1.1	19 49	2.6
40	7 2	17 10	0 29	1 33	8 8	1.0	19 47	2.8
45	7 14	16 59	0 31	1 41	8 13	.8	19 43	3.0
50	7 28	16 45	0 35	1 52	8 19	.6	19 39	3.2
55	7 46	16 27	0 40	2 6	8 27	.4	19 34	3.5
60	8 9	16 4	0 48	2 27	8 36	.0	19 28	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min		min	′	′
00	− 6 12.7	.2	15.8	$T_{\overline{m}}$	13 52	1.9	58.5	15.9
12	− 6 10.1	$T_{\overline{m}_\odot}$ 12 h 6.2 min		Starost 1.6 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 8	.1	211	−3.8	♃	22 11	.0	74	−2.5
♂	14 34	.1	189	1.7	♄	13 51	.0	200	.9

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UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 28.1	17 11.7	312 55.5	162 53.3	13 47.7	141 32.5	4 33.9
2	208 28.2	17 10.4	343 .4	192 52.3	13 45.6	171 34.5	4 32.6
4	238 28.3	17 9.1	13 5.4	222 51.3	13 43.5	201 36.6	4 31.4
6	268 28.4	17 7.7	43 10.3	252 50.3	13 41.4	231 38.7	4 30.1
8	298 28.5	17 6.4	73 15.2	282 49.3	13 39.2	261 40.8	4 28.8
10	328 28.7	17 5.0	103 20.1	312 48.3	13 37.1	291 42.8	4 27.5
12	358 28.8	17 3.7	133 25.1	342 47.3	13 35.0	321 44.9	4 26.3
14	28 28.9	17 2.4	163 30.0	12 46.3	13 32.9	351 47.0	4 25.0
16	58 29.0	17 1.0	193 34.9	42 45.3	13 30.7	21 49.1	4 23.7
18	88 29.1	16 59.7	223 39.9	72 44.3	13 28.6	51 51.1	4 22.4
20	118 29.3	16 58.3	253 44.8	102 43.3	13 26.4	81 53.2	4 21.2
22	148 29.4	16 57.0	283 49.7	132 42.3	13 24.3	111 55.3	4 19.9
Δ	1	−7		−5	−11	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	147 18.0	135	3 33.2	−155	27 15.3	−22 54.5	152 33.5	10 4.7
2	176 23.0	136	3 2.1	−155	57 20.8	−22 54.6	182 37.9	10 4.5
4	205 28.2	137	2 31.1	−155	87 26.3	−22 54.6	212 42.3	10 4.3
6	234 33.7	138	2 .1	−155	117 31.7	−22 54.7	242 46.6	10 4.0
8	263 39.3	139	1 29.2	−154	147 37.2	−22 54.8	272 51.0	10 3.8
10	292 45.1	140	0 58.3	−154	177 42.7	−22 54.8	302 55.4	10 3.6
12	321 51.0	141	0 27.5	−154	207 48.1	−22 54.9	332 59.8	10 3.4
14	350 57.2	141	− 0 3.2	−153	237 53.6	−22 54.9	3 4.1	10 3.1
16	20 3.4	142	− 0 33.9	−153	267 59.1	−22 55.0	33 8.5	10 2.9
18	49 9.9	143	− 1 4.5	−152	298 4.5	−22 55.1	63 12.9	10 2.7
20	78 16.4	143	− 1 35.0	−152	328 10.0	−22 55.1	93 17.2	10 2.5
22	107 23.1	144	− 2 5.4	−151	358 15.4	−22 55.2	123 21.6	10 2.3
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 49	20 22	0 57	: ::	8 17	3.8	20 34	.0
55	4 15	19 56	0 45	3 55	8 19	3.4	20 37	.3
50	4 34	19 37	0 38	2 29	8 20	3.1	20 39	.6
45	4 49	19 22	0 33	2 2	8 21	2.9	20 40	.8
40	5 1	19 10	0 30	1 47	8 22	2.7	20 41	.9
35	5 12	18 60	0 28	1 36	8 23	2.6	20 43	1.1
30	5 21	18 51	0 26	1 29	8 24	2.5	20 43	1.2
20	5 37	18 35	0 23	1 19	8 25	2.2	20 45	1.4
10	5 50	18 22	0 22	1 14	8 26	2.0	20 46	1.6
0	6 3	18 10	0 22	1 12	8 27	1.8	20 48	1.8
10	6 15	17 57	0 22	1 12	8 28	1.6	20 49	2.0
20	6 28	17 44	0 23	1 16	8 29	1.4	20 50	2.2
30	6 43	17 29	0 25	1 22	8 30	1.2	20 52	2.4
35	6 52	17 21	0 27	1 27	8 31	1.1	20 53	2.6
40	7 1	17 11	0 29	1 33	8 32	.9	20 54	2.7
45	7 13	16 60	0 31	1 41	8 33	.8	20 55	2.9
50	7 26	16 46	0 35	1 52	8 34	.6	20 56	3.1
55	7 44	16 29	0 40	2 6	8 35	.3	20 58	3.4
60	8 7	16 6	0 47	2 27	8 37	.0	20 60	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 7.5	.2	15.8	$T_{\overline{m}}$	14 37	1.8	57.7	15.7
12	− 6 4.6	$T_{\overline{m}_\odot}$	12 h 6.1 min	Starost	2.6 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 9	.1	210	−3.8	♃	22 7	.0	74	−2.5
♂	14 33	.1	189	1.7	♄	13 48	.0	200	.9

5. AVGUST UTORAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 29.5	16 55.6	313 54.6	162 41.3	13 22.2	141 57.4	4 18.6
2	208 29.6	16 54.2	343 59.6	192 40.3	13 20.0	171 59.4	4 17.3
4	238 29.8	16 52.9	14 4.5	222 39.3	13 17.9	202 1.5	4 16.1
6	268 29.9	16 51.5	44 9.4	252 38.3	13 15.7	232 3.6	4 14.8
8	298 30.0	16 50.2	74 14.4	282 37.4	13 13.6	262 5.7	4 13.5
10	328 30.2	16 48.8	104 19.3	312 36.4	13 11.4	292 7.7	4 12.2
12	358 30.3	16 47.4	134 24.2	342 35.4	13 9.3	322 9.8	4 11.0
14	28 30.4	16 46.0	164 29.1	12 34.4	13 7.1	352 11.9	4 9.7
16	58 30.6	16 44.7	194 34.1	42 33.4	13 4.9	22 13.9	4 8.4
18	88 30.7	16 43.3	224 39.0	72 32.5	13 2.8	52 16.0	4 7.1
20	118 30.8	16 41.9	254 43.9	102 31.5	13 .6	82 18.1	4 5.8
22	148 31.0	16 40.6	284 48.9	132 30.5	12 58.4	112 20.2	4 4.6
Δ	1	−7		−5	−11	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	136 29.8	144	− 2 35.6	−151	28 20.9	−22 55.3	153 26.0	10 2.0
2	165 36.7	145	− 3 5.8	−150	58 26.3	−22 55.3	183 30.4	10 1.8
4	194 43.7	145	− 3 35.8	−149	88 31.8	−22 55.4	213 34.7	10 1.6
6	223 50.7	146	− 4 5.7	−149	118 37.3	−22 55.4	243 39.1	10 1.4
8	252 57.9	146	− 4 35.4	−148	148 42.7	−22 55.5	273 43.5	10 1.1
10	282 5.0	146	− 5 5.0	−147	178 48.2	−22 55.6	303 47.9	10 .9
12	311 12.3	146	− 5 34.4	−146	208 53.6	−22 55.6	333 52.2	10 .7
14	340 19.6	147	− 6 3.7	−145	238 59.1	−22 55.7	3 56.6	10 .5
16	9 26.9	147	− 6 32.8	−145	269 4.5	−22 55.7	34 1.0	10 .3
18	38 34.3	147	− 7 1.7	−144	299 10.0	−22 55.8	64 5.3	10 .0
20	67 41.6	147	− 7 30.4	−143	329 15.4	−22 55.9	94 9.7	9 59.8
22	96 49.0	147	− 7 58.9	−142	359 20.9	−22 55.9	124 14.1	9 59.6
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 51	20 19	0 57	: ::	9 47	3.7	20 35	.0
55	4 17	19 54	0 45	3 39	9 41	3.3	20 45	.4
50	4 35	19 36	0 38	2 27	9 36	3.1	20 53	.6
45	4 50	19 21	0 33	2 1	9 32	2.9	20 59	.8
40	5 2	19 9	0 30	1 46	9 28	2.7	21 4	1.0
35	5 13	18 59	0 27	1 36	9 25	2.5	21 9	1.1
30	5 22	18 50	0 26	1 28	9 23	2.4	21 13	1.2
20	5 37	18 35	0 23	1 19	9 18	2.2	21 20	1.5
10	5 50	18 22	0 22	1 14	9 14	2.0	21 26	1.6
0	6 3	18 9	0 22	1 12	9 11	1.8	21 31	1.8
10	6 15	17 57	0 22	1 12	9 7	1.6	21 37	2.0
20	6 28	17 45	0 23	1 16	9 3	1.4	21 43	2.2
30	6 42	17 30	0 25	1 22	8 59	1.2	21 50	2.4
35	6 51	17 22	0 27	1 27	8 57	1.1	21 54	2.5
40	7 0	17 12	0 29	1 33	8 54	1.0	21 59	2.7
45	7 11	17 1	0 31	1 41	8 51	.8	22 4	2.8
50	7 25	16 48	0 35	1 51	8 47	.6	22 11	3.1
55	7 42	16 31	0 40	2 6	8 43	.3	22 19	3.3
60	8 4	16 8	0 47	2 26	8 37	.0	22 29	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 6 1.8	.3	15.8	$T_{\overline{m}}$	15 21	1.8	56.9	15.5
12	− 5 58.6	$T_{\overline{m}_\odot}$	12 h 6.0 min	Starost	3.6 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 10	.1	209	−3.8	♃	22 3	.0	74	−2.5
♂	14 31	.1	188	1.7	♄	13 44	.0	200	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 31.1	16 39.2	314 53.8	162 29.5	12 56.3	142 22.2	4 3.3
2	208 31.3	16 37.8	344 58.7	192 28.6	12 54.1	172 24.3	4 2.0
4	238 31.4	16 36.4	15 3.6	222 27.6	12 51.9	202 26.4	4 .7
6	268 31.5	16 35.0	45 8.6	252 26.7	12 49.8	232 28.4	3 59.4
8	298 31.7	16 33.6	75 13.5	282 25.7	12 47.6	262 30.5	3 58.2
10	328 31.8	16 32.3	105 18.4	312 24.7	12 45.4	292 32.6	3 56.9
12	358 32.0	16 30.9	135 23.4	342 23.8	12 43.2	322 34.6	3 55.6
14	28 32.1	16 29.5	165 28.3	12 22.8	12 41.0	352 36.7	3 54.3
16	58 32.3	16 28.1	195 33.2	42 21.9	12 38.8	22 38.8	3 53.0
18	88 32.4	16 26.7	225 38.1	72 20.9	12 36.6	52 40.9	3 51.8
20	118 32.6	16 25.3	255 43.1	102 19.9	12 34.4	82 42.9	3 50.5
22	148 32.7	16 23.9	285 48.0	132 19.0	12 32.2	112 45.0	3 49.2
Δ	1	−7		−5	−11	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	125 56.4	147	− 8 27.2	−141	29 26.3	−22 56.0	154 18.4	9 59.4
2	155 3.8	147	− 8 55.4	−140	59 31.8	−22 56.0	184 22.8	9 59.1
4	184 11.2	147	− 9 23.3	−138	89 37.2	−22 56.1	214 27.2	9 58.9
6	213 18.5	147	− 9 51.0	−137	119 42.6	−22 56.2	244 31.6	9 58.7
8	242 25.9	146	−10 18.4	−136	149 48.1	−22 56.2	274 35.9	9 58.5
10	271 33.2	146	−10 45.7	−135	179 53.5	−22 56.3	304 40.3	9 58.2
12	300 40.4	146	−11 12.7	−134	209 59.0	−22 56.3	334 44.7	9 58.0
14	329 47.6	146	−11 39.4	−133	240 4.4	−22 56.4	4 49.0	9 57.8
16	358 54.7	145	−12 5.9	−131	270 9.8	−22 56.5	34 53.4	9 57.6
18	28 1.8	145	−12 32.2	−130	300 15.3	−22 56.5	64 57.8	9 57.4
20	57 8.8	145	−12 58.2	−129	330 20.7	−22 56.6	95 2.1	9 57.1
22	86 15.7	144	−13 23.9	−127	0 26.2	−22 56.6	125 6.5	9 56.9
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 53	20 17	0 56	: ::	11 16	3.7	20 36	.1
55	4 18	19 52	0 44	3 29	11 1	3.3	20 54	.5
50	4 37	19 34	0 37	2 26	10 49	3.0	21 7	.7
45	4 51	19 20	0 33	2 1	10 40	2.8	21 18	.9
40	5 3	19 8	0 30	1 46	10 33	2.7	21 28	1.1
35	5 13	18 58	0 27	1 35	10 26	2.5	21 35	1.2
30	5 22	18 49	0 26	1 28	10 20	2.4	21 42	1.3
20	5 37	18 34	0 23	1 19	10 11	2.2	21 54	1.5
10	5 50	18 21	0 22	1 14	10 2	2.0	22 5	1.7
0	6 2	18 9	0 22	1 12	9 54	1.8	22 15	1.9
10	6 14	17 57	0 22	1 12	9 46	1.7	22 25	2.0
20	6 27	17 45	0 23	1 15	9 38	1.5	22 36	2.2
30	6 41	17 31	0 25	1 22	9 29	1.3	22 48	2.4
35	6 50	17 22	0 27	1 26	9 23	1.2	22 55	2.5
40	6 59	17 13	0 29	1 33	9 17	1.0	23 3	2.6
45	7 10	17 2	0 31	1 41	9 10	.9	23 12	2.8
50	7 23	16 49	0 35	1 51	9 2	.7	23 24	3.0
55	7 40	16 33	0 40	2 5	8 51	.4	23 38	3.3
60	8 2	16 11	0 47	2 26	8 38	.1	23 58	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 55.4	.3	15.8	$T_{\overline{m}}$ 16 4	1.9	56.1	15.3
12	− 5 51.9	$T_{\overline{m}_\odot}$ 12 h 5.9 min		Starost 4.6 d		Faza ◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 10	.1	208	−3.8	♃	21 58	.0	75	−2.5
♂	14 30	.1	187	1.7	♄	13 41	.0	199	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 32.9	16 22.5	315 52.9	162 18.1	12 30.0	142 47.1	3 47.9
2	208 33.0	16 21.1	345 57.8	192 17.1	12 27.8	172 49.1	3 46.6
4	238 33.2	16 19.7	16 2.8	222 16.2	12 25.6	202 51.2	3 45.3
6	268 33.3	16 18.3	46 7.7	252 15.2	12 23.4	232 53.3	3 44.1
8	298 33.5	16 16.9	76 12.6	282 14.3	12 21.2	262 55.3	3 42.8
10	328 33.6	16 15.5	106 17.6	312 13.3	12 19.0	292 57.4	3 41.5
12	358 33.8	16 14.0	136 22.5	342 12.4	12 16.8	322 59.5	3 40.2
14	28 34.0	16 12.6	166 27.4	12 11.5	12 14.6	353 1.5	3 38.9
16	58 34.1	16 11.2	196 32.3	42 10.5	12 12.4	23 3.6	3 37.6
18	88 34.3	16 9.8	226 37.3	72 9.6	12 10.2	53 5.7	3 36.4
20	118 34.4	16 8.4	256 42.2	102 8.7	12 7.9	83 7.7	3 35.1
22	148 34.6	16 7.0	286 47.1	132 7.7	12 5.7	113 9.8	3 33.8
Δ	1	−7		−5	−11	10	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	115 22.5	144	−13 49.3	−126	30 31.6	−22 56.7	155 10.9	9 56.7
2	144 29.2	143	−14 14.5	−124	60 37.0	−22 56.8	185 15.2	9 56.5
4	173 35.8	143	−14 39.4	−123	90 42.5	−22 56.8	215 19.6	9 56.2
6	202 42.3	142	−15 4.0	−122	120 47.9	−22 56.9	245 24.0	9 56.0
8	231 48.7	141	−15 28.3	−120	150 53.3	−22 56.9	275 28.3	9 55.8
10	260 55.0	141	−15 52.3	−118	180 58.7	−22 57.0	305 32.7	9 55.6
12	290 1.2	140	−16 15.9	−117	211 4.2	−22 57.0	335 37.1	9 55.3
14	319 7.2	139	−16 39.3	−115	241 9.6	−22 57.1	5 41.4	9 55.1
16	348 13.1	139	−17 2.4	−114	271 15.0	−22 57.2	35 45.8	9 54.9
18	17 18.8	138	−17 25.1	−112	301 20.4	−22 57.2	65 50.2	9 54.7
20	46 24.4	137	−17 47.5	−110	331 25.9	−22 57.3	95 54.5	9 54.4
22	75 29.9	136	−18 9.6	−109	1 31.3	−22 57.3	125 58.9	9 54.2
Δ					27	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 56	20 14	0 55	: ::	12 45	3.8	20 38	.2
55	4 20	19 50	0 44	3 22	12 20	3.3	21 5	.6
50	4 38	19 32	0 37	2 24	12 2	3.0	21 25	.9
45	4 53	19 18	0 33	1 60	11 48	2.8	21 40	1.1
40	5 4	19 7	0 30	1 45	11 36	2.6	21 53	1.2
35	5 14	18 57	0 27	1 35	11 26	2.5	22 4	1.3
30	5 23	18 48	0 26	1 28	11 18	2.4	22 14	1.5
20	5 38	18 34	0 23	1 18	11 3	2.2	22 31	1.6
10	5 50	18 21	0 22	1 14	10 50	2.0	22 46	1.8
0	6 2	18 9	0 22	1 12	10 38	1.9	22 59	1.9
10	6 14	17 58	0 22	1 12	10 26	1.7	23 13	2.1
20	6 26	17 45	0 23	1 15	10 13	1.6	23 28	2.2
30	6 41	17 31	0 25	1 22	9 59	1.4	23 45	2.4
35	6 49	17 23	0 26	1 26	9 51	1.3	23 55	2.5
40	6 58	17 14	0 28	1 32	9 41	1.1	.. ..	.0
45	7 9	17 3	0 31	1 40	9 31	1.0	.. ..	.0
50	7 22	16 51	0 35	1 51	9 17	.8	.. ..	.0
55	7 38	16 34	0 39	2 5	9 1	.5	.. ..	.0
60	7 59	16 13	0 47	2 25	8 39	.1	.. ..	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 48.4	.3	15.8	$T_{\overline{m}}$ 16 49	1.9	55.4	15.1
12	− 5 44.5	$T_{\overline{m}_\odot}$ 12 h 5.7 min		Starost 5.6 d		Faza ◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 11	.1	206	−3.8	♃	21 54	.0	75	−2.5
♂	14 28	.1	187	1.7	♄	13 37	.0	199	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 34.8	16 5.5	316 52.1	162 6.8	12 3.5	143 11.9	3 32.5
2	208 34.9	16 4.1	346 57.0	192 5.9	12 1.3	173 13.9	3 31.2
4	238 35.1	16 2.7	17 1.9	222 5.0	11 59.0	203 16.0	3 29.9
6	268 35.3	16 1.3	47 6.8	252 4.0	11 56.8	233 18.1	3 28.6
8	298 35.4	15 59.8	77 11.8	282 3.1	11 54.6	263 20.1	3 27.4
10	328 35.6	15 58.4	107 16.7	312 2.2	11 52.3	293 22.2	3 26.1
12	358 35.8	15 57.0	137 21.6	342 1.3	11 50.1	323 24.3	3 24.8
14	28 36.0	15 55.5	167 26.6	12 .4	11 47.8	353 26.3	3 23.5
16	58 36.1	15 54.1	197 31.5	41 59.4	11 45.6	23 28.4	3 22.2
18	88 36.3	15 52.7	227 36.4	71 58.5	11 43.4	53 30.5	3 20.9
20	118 36.5	15 51.2	257 41.3	101 57.6	11 41.1	83 32.5	3 19.6
22	148 36.6	15 49.8	287 46.3	131 56.7	11 38.9	113 34.6	3 18.3
Δ	1	-7		-5	-11	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	104 35.1	136	-18 31.3	-107	31 36.7	-22 57.4	156 3.3	9 54.0
2	133 40.3	135	-18 52.7	-105	61 42.1	-22 57.4	186 7.6	9 53.8
4	162 45.2	134	-19 13.8	-103	91 47.6	-22 57.5	216 12.0	9 53.5
6	191 50.0	133	-19 34.5	-102	121 53.0	-22 57.6	246 16.4	9 53.3
8	220 54.6	132	-19 54.8	-100	151 58.4	-22 57.6	276 20.7	9 53.1
10	249 59.1	131	-20 14.7	-98	182 3.8	-22 57.7	306 25.1	9 52.9
12	279 3.3	130	-20 34.3	-96	212 9.2	-22 57.7	336 29.5	9 52.6
14	308 7.4	129	-20 53.5	-94	242 14.6	-22 57.8	6 33.8	9 52.4
16	337 11.3	129	-21 12.4	-92	272 20.0	-22 57.8	36 38.2	9 52.2
18	6 15.0	128	-21 30.8	-90	302 25.5	-22 57.9	66 42.6	9 52.0
20	35 18.5	127	-21 48.8	-88	332 30.9	-22 57.9	96 46.9	9 51.7
22	64 21.8	126	-22 6.5	-86	2 36.3	-22 58.0	126 51.3	9 51.5
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	3 58	20 11	0 55	: ::	14 15	3.8	20 42	.3
55	4 22	19 48	0 44	3 16	13 39	3.2	21 19	.9
50	4 40	19 30	0 37	2 23	13 14	2.9	21 46	1.1
45	4 54	19 17	0 33	1 59	12 55	2.7	22 6	1.3
40	5 5	19 5	0 30	1 45	12 39	2.6	22 23	1.4
35	5 15	18 56	0 27	1 35	12 26	2.5	22 37	1.5
30	5 23	18 47	0 25	1 27	12 15	2.4	22 49	1.6
20	5 38	18 33	0 23	1 18	11 55	2.2	23 10	1.8
10	5 51	18 21	0 22	1 13	11 39	2.1	23 28	1.9
0	6 2	18 9	0 21	1 11	11 23	2.0	23 45	2.0
10	6 14	17 58	0 22	1 12	11 8	1.8	. ..	.0
20	6 26	17 46	0 23	1 15	10 51	1.7	. ..	.0
30	6 40	17 32	0 25	1 22	10 32	1.5	. ..	.0
35	6 48	17 24	0 26	1 26	10 21	1.4	. ..	.0
40	6 57	17 15	0 28	1 32	10 9	1.3	0 7	2.6
45	7 7	17 5	0 31	1 40	9 54	1.2	0 20	2.8
50	7 20	16 52	0 34	1 51	9 36	1.0	0 37	3.0
55	7 36	16 36	0 39	2 5	9 13	.7	0 59	3.3
60	7 57	16 15	0 46	2 25	8 42	.2	1 28	3.8
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 40.7	.3	15.8	$T_{\overline{m}}$	17 34	2.0	54.9	15.0
12	− 5 36.6	$T_{\overline{m}_\odot}$	12 h 5.6 min	Starost	6.6 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 12	.1	205	-3.8	♃	21 50	.0	75	-2.5
♂	14 26	.1	186	1.7	♄	13 34	.0	199	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 36.8	15 48.3	317 51.2	161 55.8	11 36.6	143 36.7	3 17.1
2	208 37.0	15 46.9	347 56.1	191 54.9	11 34.4	173 38.7	3 15.8
4	238 37.2	15 45.4	18 1.1	221 54.0	11 32.1	203 40.8	3 14.5
6	268 37.4	15 44.0	48 6.0	251 53.1	11 29.8	233 42.8	3 13.2
8	298 37.5	15 42.5	78 10.9	281 52.2	11 27.6	263 44.9	3 11.9
10	328 37.7	15 41.1	108 15.8	311 51.3	11 25.3	293 47.0	3 10.6
12	358 37.9	15 39.6	138 20.8	341 50.4	11 23.1	323 49.0	3 9.3
14	28 38.1	15 38.2	168 25.7	11 49.5	11 20.8	353 51.1	3 8.0
16	58 38.3	15 36.7	198 30.6	41 48.6	11 18.5	23 53.2	3 6.7
18	88 38.5	15 35.3	228 35.6	71 47.7	11 16.2	53 55.2	3 5.5
20	118 38.6	15 33.8	258 40.5	101 46.8	11 14.0	83 57.3	3 4.2
22	148 38.8	15 32.3	288 45.4	131 45.9	11 11.7	113 59.3	3 2.9
Δ	1	-7		-4	-11	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	93 25.0	125	-22 23.7	-84	32 41.7	-22 58.1	156 55.7	9 51.3
2	122 27.9	124	-22 40.6	-82	62 47.1	-22 58.1	187 .0	9 51.1
4	151 30.6	123	-22 57.0	-80	92 52.5	-22 58.2	217 4.4	9 50.8
6	180 33.2	122	-23 13.0	-78	122 57.9	-22 58.2	247 8.7	9 50.6
8	209 35.5	121	-23 28.6	-76	153 3.3	-22 58.3	277 13.1	9 50.4
10	238 37.7	120	-23 43.7	-74	183 8.7	-22 58.3	307 17.5	9 50.2
12	267 39.6	119	-23 58.4	-71	213 14.1	-22 58.4	337 21.8	9 49.9
14	296 41.4	118	-24 12.7	-69	243 19.5	-22 58.4	7 26.2	9 49.7
16	325 43.0	117	-24 26.5	-67	273 24.9	-22 58.5	37 30.6	9 49.5
18	354 44.3	116	-24 39.9	-65	303 30.3	-22 58.5	67 34.9	9 49.2
20	23 45.5	115	-24 52.9	-62	333 35.7	-22 58.6	97 39.3	9 49.0
22	52 46.5	114	-25 5.3	-60	3 41.1	-22 58.7	127 43.6	9 48.8
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 0	20 9	0 54	: ::	15 45	3.6	20 50	.7
55	4 24	19 46	0 43	3 11	14 57	3.0	21 40	1.3
50	4 41	19 29	0 37	2 21	14 25	2.8	22 13	1.5
45	4 55	19 15	0 33	1 58	14 1	2.6	22 37	1.6
40	5 6	19 4	0 29	1 44	13 42	2.5	22 57	1.7
35	5 16	18 55	0 27	1 34	13 26	2.4	23 14	1.8
30	5 24	18 47	0 25	1 27	13 12	2.3	23 28	1.8
20	5 38	18 32	0 23	1 18	12 49	2.2	23 53	1.9
10	5 51	18 20	0 22	1 13	12 29	2.1	. ..	.0
0	6 2	18 9	0 21	1 11	12 10	2.0	. ..	.0
10	6 13	17 58	0 22	1 12	11 52	2.0	0 3	2.1
20	6 25	17 46	0 23	1 15	11 32	1.9	0 21	2.2
30	6 39	17 32	0 25	1 21	11 9	1.7	0 43	2.4
35	6 47	17 25	0 26	1 26	10 56	1.7	0 55	2.5
40	6 56	17 16	0 28	1 32	10 40	1.6	1 10	2.6
45	7 6	17 6	0 31	1 40	10 22	1.5	1 27	2.7
50	7 18	16 53	0 34	1 50	9 60	1.3	1 48	2.9
55	7 34	16 38	0 39	2 5	9 30	1.0	2 17	3.1
60	7 54	16 18	0 46	2 24	8 48	.5	2 58	3.7
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 5 32.5	.4	15.8	$T_{\overline{m}}$	18 22	2.0	54.5	14.8
12	− 5 28.1	$T_{\overline{m}_\odot}$	12 h 5.5 min	Starost	7.6 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 13	.1	204	-3.8	♃	21 45	.0	75	-2.5
♂	14 25	.1	186	1.7	♄	13 30	.0	199	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 39.0	15 30.9	318 50.3	161 45.1	11 9.4	144 1.4	3 1.6
2	208 39.2	15 29.4	348 55.3	191 44.2	11 7.1	174 3.5	3 .3
4	238 39.4	15 27.9	19 .2	221 43.3	11 4.9	204 5.5	2 59.0
6	268 39.6	15 26.5	49 5.1	251 42.4	11 2.6	234 7.6	2 57.7
8	298 39.8	15 25.0	79 10.0	281 41.5	11 .3	264 9.6	2 56.4
10	328 40.0	15 23.5	109 15.0	311 40.6	10 58.0	294 11.7	2 55.1
12	358 40.2	15 22.0	139 19.9	341 39.8	10 55.7	324 13.8	2 53.8
14	28 40.4	15 20.6	169 24.8	11 38.9	10 53.4	354 15.8	2 52.5
16	58 40.6	15 19.1	199 29.8	41 38.0	10 51.1	24 17.9	2 51.2
18	88 40.8	15 17.6	229 34.7	71 37.1	10 48.8	54 19.9	2 50.0
20	118 41.0	15 16.1	259 39.6	101 36.3	10 46.5	84 22.0	2 48.7
22	148 41.2	15 14.6	289 44.5	131 35.4	10 44.2	114 24.1	2 47.4
Δ	1	-7		-4	-11	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	81 47.3	113	-25 17.3	-58	33 46.5	-22 58.7	157 48.0	9 48.6
2	110 47.9	112	-25 28.9	-55	63 51.9	-22 58.8	187 52.4	9 48.3
4	139 48.4	111	-25 39.9	-53	93 57.3	-22 58.8	217 56.7	9 48.1
6	168 48.6	110	-25 50.5	-51	124 2.7	-22 58.9	248 1.1	9 47.9
8	197 48.7	110	-26 .6	-48	154 8.1	-22 58.9	278 5.5	9 47.7
10	226 48.6	109	-26 10.3	-46	184 13.5	-22 59.0	308 9.8	9 47.4
12	255 48.4	108	-26 19.4	-43	214 18.9	-22 59.0	338 14.2	9 47.2
14	284 48.0	107	-26 28.1	-41	244 24.2	-22 59.1	8 18.5	9 47.0
16	313 47.4	106	-26 36.2	-38	274 29.6	-22 59.1	38 22.9	9 46.7
18	342 46.7	106	-26 43.8	-36	304 35.0	-22 59.2	68 27.3	9 46.5
20	11 45.8	105	-26 51.0	-33	334 40.4	-22 59.2	98 31.6	9 46.3
22	40 44.8	104	-26 57.6	-31	4 45.8	-22 59.3	128 36.0	9 46.1
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 3	20 6	0 53	: ::	17 11	2.9	21 7	1.5
55	4 26	19 44	0 43	3 7	16 9	2.6	22 10	1.8
50	4 43	19 27	0 37	2 20	15 31	2.4	22 48	1.9
45	4 56	19 14	0 32	1 58	15 3	2.4	23 16	2.0
40	5 7	19 3	0 29	1 44	14 42	2.3	23 38	2.0
35	5 16	18 54	0 27	1 34	14 24	2.3	23 57	2.0
30	5 25	18 46	0 25	1 27	14 8	2.3	. . ..	.0
20	5 39	18 32	0 23	1 18	13 42	2.2	. . ..	.0
10	5 51	18 20	0 22	1 13	13 20	2.2	0 14	2.0
0	6 2	18 9	0 21	1 11	12 59	2.1	0 34	2.1
10	6 13	17 58	0 22	1 12	12 38	2.1	0 53	2.2
20	6 25	17 46	0 23	1 15	12 16	2.0	1 15	2.2
30	6 38	17 33	0 25	1 21	11 51	2.0	1 39	2.3
35	6 46	17 25	0 26	1 26	11 36	1.9	1 54	2.4
40	6 54	17 17	0 28	1 32	11 18	1.9	2 11	2.4
45	7 4	17 7	0 31	1 40	10 57	1.8	2 31	2.5
50	7 16	16 55	0 34	1 50	10 31	1.7	2 57	2.6
55	7 32	16 40	0 39	2 4	9 55	1.5	3 32	2.8
60	7 52	16 20	0 46	2 24	9 0	1.1	4 26	3.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 23.7	.4	15.8	$T_{\overline{m}}$ 19 11	2.1	54.3	14.8
12	− 5 19.0	$T_{\overline{m}_\odot}$ 12 h 5.3 min		Starost 8.6 d		Faza ◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 13	.1	203	-3.8	♃	21 41	.0	75	-2.5
♂	14 23	.1	185	1.7	♄	13 27	.0	199	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 41.4	15 13.2	319 49.5	161 34.5	10 41.9	144 26.1	2 46.1
2	208 41.6	15 11.7	349 54.4	191 33.7	10 39.6	174 28.2	2 44.8
4	238 41.8	15 10.2	19 59.3	221 32.8	10 37.3	204 30.2	2 43.5
6	268 42.0	15 8.7	50 4.3	251 31.9	10 35.0	234 32.3	2 42.2
8	298 42.2	15 7.2	80 9.2	281 31.1	10 32.7	264 34.4	2 40.9
10	328 42.4	15 5.7	110 14.1	311 30.2	10 30.4	294 36.4	2 39.6
12	358 42.6	15 4.2	140 19.0	341 29.4	10 28.1	324 38.5	2 38.3
14	28 42.8	15 2.7	170 24.0	11 28.5	10 25.8	354 40.5	2 37.0
16	58 43.0	15 1.2	200 28.9	41 27.7	10 23.5	24 42.6	2 35.7
18	88 43.2	14 59.7	230 33.8	71 26.8	10 21.2	54 44.6	2 34.4
20	118 43.4	14 58.2	260 38.8	101 26.0	10 18.8	84 46.7	2 33.1
22	148 43.7	14 56.7	290 43.7	131 25.1	10 16.5	114 48.8	2 31.8
Δ	1	-7		-4	-12	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	69 43.6	104	-27 3.7	-28	34 51.2	-22 59.3	158 40.3	9 45.8
2	98 42.3	103	-27 9.4	-25	64 56.5	-22 59.4	188 44.7	9 45.6
4	127 40.9	102	-27 14.4	-23	95 1.9	-22 59.4	218 49.1	9 45.4
6	156 39.4	102	-27 19.0	-20	125 7.3	-22 59.5	248 53.4	9 45.2
8	185 37.8	101	-27 23.1	-18	155 12.7	-22 59.5	278 57.8	9 44.9
10	214 36.1	101	-27 26.6	-15	185 18.1	-22 59.6	309 2.1	9 44.7
12	243 34.3	100	-27 29.6	-12	215 23.4	-22 59.6	339 6.5	9 44.5
14	272 32.4	100	-27 32.0	-10	245 28.8	-22 59.7	9 10.9	9 44.2
16	301 30.4	100	-27 34.0	-7	275 34.2	-22 59.7	39 15.2	9 44.0
18	330 28.3	99	-27 35.4	-4	305 39.5	-22 59.8	69 19.6	9 43.8
20	359 26.2	99	-27 36.2	-2	335 44.9	-22 59.8	99 23.9	9 43.6
22	28 24.0	99	-27 36.6	1	5 50.3	-22 59.9	129 28.3	9 43.3
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 5	20 3	0 53	: ::	18 20	1.7	21 44	2.7
55	4 28	19 41	0 43	3 3	17 10	2.0	22 54	2.5
50	4 44	19 25	0 37	2 19	16 30	2.0	23 35	2.4
45	4 57	19 12	0 32	1 57	16 1	2.1	. . ..	.0
40	5 8	19 2	0 29	1 43	15 38	2.1	. . ..	.0
35	5 17	18 53	0 27	1 34	15 19	2.1	. . ..	.0
30	5 25	18 45	0 25	1 27	15 3	2.1	0 12	2.1
20	5 39	18 31	0 23	1 18	14 35	2.1	0 39	2.1
10	5 51	18 19	0 22	1 13	14 12	2.1	1 2	2.1
0	6 2	18 9	0 21	1 11	13 50	2.1	1 24	2.1
10	6 13	17 58	0 22	1 12	13 28	2.2	1 45	2.2
20	6 24	17 46	0 23	1 15	13 5	2.2	2 8	2.2
30	6 37	17 34	0 25	1 21	12 38	2.2	2 35	2.2
35	6 45	17 26	0 26	1 26	12 21	2.2	2 51	2.2
40	6 53	17 18	0 28	1 32	12 3	2.2	3 9	2.2
45	7 3	17 8	0 31	1 40	11 40	2.2	3 31	2.2
50	7 15	16 56	0 34	1 50	11 12	2.2	3 60	2.2
55	7 30	16 42	0 39	2 4	10 32	2.2	4 39	2.3
60	7 49	16 22	0 46	2 24	9 26	2.1	5 45	2.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 14.3	.4	15.8	$T_{\overline{m}}$ 20 2	2.2	54.2	14.8
12	− 5 9.3	$T_{\overline{m}_\odot}$ 12 h 5.2 min		Starost 9.6 d		Faza ◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 14	.1	202	-3.8	♃	21 37	.0	75	-2.5
♂	14 21	.1	185	1.7	♄	13 23	.0	199	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 43.9	14 55.2	320 48.6	161 24.3	10 14.2	144 50.8	2 30.5
2	208 44.1	14 53.7	350 53.5	191 23.4	10 11.9	174 52.9	2 29.2
4	238 44.3	14 52.2	20 58.5	221 22.6	10 9.5	204 54.9	2 27.9
6	268 44.5	14 50.7	51 3.4	251 21.7	10 7.2	234 57.0	2 26.6
8	298 44.7	14 49.2	81 8.3	281 20.9	10 4.9	264 59.0	2 25.3
10	328 44.9	14 47.7	111 13.3	311 20.0	10 2.5	295 1.1	2 24.0
12	358 45.2	14 46.2	141 18.2	341 19.2	10 .2	325 3.2	2 22.7
14	28 45.4	14 44.6	171 23.1	11 18.4	9 57.9	355 5.2	2 21.4
16	58 45.6	14 43.1	201 28.0	41 17.5	9 55.5	25 7.3	2 20.2
18	88 45.8	14 41.6	231 33.0	71 16.7	9 53.2	55 9.3	2 18.9
20	118 46.1	14 40.1	261 37.9	101 15.8	9 50.9	85 11.4	2 17.6
22	148 46.3	14 38.6	291 42.8	131 15.0	9 48.5	115 13.4	2 16.3
Δ	1	-8		-4	-12	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	57 21.8	99	-27 36.4	4	35 55.7	-22 59.9	159 32.6	9 43.1
2	86 19.6	99	-27 35.6	6	66 1.0	-22 60.0	189 37.0	9 42.9
4	115 17.3	98	-27 34.3	9	96 6.4	-23 .0	219 41.4	9 42.6
6	144 15.0	98	-27 32.5	12	126 11.8	-23 .1	249 45.7	9 42.4
8	173 12.7	98	-27 30.1	15	156 17.1	-23 .1	279 50.1	9 42.2
10	202 10.4	98	-27 27.2	17	186 22.5	-23 .2	309 54.4	9 42.0
12	231 8.0	99	-27 23.7	20	216 27.8	-23 .2	339 58.8	9 41.7
14	260 5.7	99	-27 19.7	23	246 33.2	-23 .3	10 3.1	9 41.5
16	289 3.5	99	-27 15.2	25	276 38.6	-23 .3	40 7.5	9 41.3
18	318 1.2	99	-27 10.1	28	306 43.9	-23 .4	70 11.9	9 41.0
20	346 59.0	99	-27 4.5	31	336 49.3	-23 .4	100 16.2	9 40.8
22	15 56.9	99	-26 58.4	33	6 54.6	-23 .5	130 20.6	9 40.6
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 8	20 1	0 52	: ::	19 2	.8	22 50	3.6
55	4 29	19 39	0 42	2 59	17 57	1.4	23 54	3.0
50	4 46	19 23	0 36	2 17	17 18	1.6	.. ..	.0
45	4 58	19 11	0 32	1 56	16 50	1.7	0 4	2.4
40	5 9	19 0	0 29	1 43	16 28	1.8	0 27	2.3
35	5 18	18 52	0 27	1 33	16 9	1.9	0 46	2.3
30	5 26	18 44	0 25	1 26	15 53	1.9	1 2	2.3
20	5 39	18 31	0 23	1 18	15 26	2.0	1 29	2.2
10	5 51	18 19	0 22	1 13	15 3	2.1	1 53	2.2
0	6 2	18 8	0 21	1 11	14 41	2.1	2 15	2.1
10	6 12	17 58	0 22	1 12	14 20	2.2	2 37	2.1
20	6 23	17 47	0 23	1 15	13 57	2.3	3 0	2.1
30	6 36	17 34	0 25	1 21	13 30	2.3	3 27	2.0
35	6 44	17 27	0 26	1 26	13 14	2.4	3 44	2.0
40	6 52	17 19	0 28	1 32	12 55	2.4	4 2	1.9
45	7 1	17 9	0 31	1 40	12 33	2.5	4 25	1.9
50	7 13	16 58	0 34	1 50	12 4	2.6	4 54	1.8
55	7 27	16 43	0 39	2 4	11 24	2.8	5 34	1.7
60	7 46	16 24	0 45	2 23	10 17	3.2	6 41	1.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 5 4.3	.4	15.8	$T_{\overline{m}}$ 20 54	2.1	54.3	14.8
12	− 4 59.1	$T_{\overline{m}_\odot}$ 12 h 5.0 min		Starost 10.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 15	.1	201	-3.8	♃	21 32	.0	75	-2.5
♂	14 20	.1	184	1.7	♄	13 20	.0	199	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 46.5	14 37.0	321 47.8	161 14.2	9 46.2	145 15.5	2 15.0
2	208 46.7	14 35.5	351 52.7	191 13.4	9 43.8	175 17.5	2 13.7
4	238 47.0	14 34.0	21 57.6	221 12.5	9 41.5	205 19.6	2 12.4
6	268 47.2	14 32.5	52 2.5	251 11.7	9 39.1	235 21.6	2 11.1
8	298 47.4	14 30.9	82 7.5	281 10.9	9 36.8	265 23.7	2 9.8
10	328 47.6	14 29.4	112 12.4	311 10.1	9 34.4	295 25.7	2 8.5
12	358 47.9	14 27.9	142 17.3	341 9.2	9 32.1	325 27.8	2 7.2
14	28 48.1	14 26.3	172 22.3	11 8.4	9 29.7	355 29.8	2 5.9
16	58 48.3	14 24.8	202 27.2	41 7.6	9 27.3	25 31.9	2 4.6
18	88 48.6	14 23.2	232 32.1	71 6.8	9 25.0	55 33.9	2 3.3
20	118 48.8	14 21.7	262 37.0	101 6.0	9 22.6	85 36.0	2 2.0
22	148 49.0	14 20.2	292 42.0	131 5.1	9 20.3	115 38.0	2 .7
Δ	1	-8		-4	-12	10	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	44 54.8	100	-26 51.7	36	36 60.0	-23 .5	160 24.9	9 40.4
2	73 52.7	100	-26 44.5	39	67 5.3	-23 .6	190 29.3	9 40.1
4	102 50.7	101	-26 36.7	41	97 10.7	-23 .6	220 33.6	9 39.9
6	131 48.9	101	-26 28.4	44	127 16.0	-23 .7	250 38.0	9 39.7
8	160 47.0	101	-26 19.6	47	157 21.4	-23 .7	280 42.4	9 39.4
10	189 45.3	102	-26 10.3	49	187 26.7	-23 .8	310 46.7	9 39.2
12	218 43.7	102	-26 .4	52	217 32.1	-23 .8	340 51.1	9 39.0
14	247 42.2	103	-25 50.1	54	247 37.4	-23 .9	10 55.4	9 38.8
16	276 40.8	104	-25 39.2	57	277 42.8	-23 .9	40 59.8	9 38.5
18	305 39.5	104	-25 27.8	60	307 48.1	-23 1.0	71 4.1	9 38.3
20	334 38.4	105	-25 15.8	62	337 53.5	-23 1.0	101 8.5	9 38.1
22	3 37.4	106	-25 3.4	65	7 58.8	-23 1.1	131 12.8	9 37.8
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 10	19 58	0 52	: ::	19 22	.4	.. ..	.0
55	4 31	19 37	0 42	2 56	18 30	.9	.. ..	.0
50	4 47	19 22	0 36	2 16	17 56	1.2	0 32	2.8
45	4 60	19 9	0 32	1 55	17 31	1.4	1 0	2.7
40	5 10	18 59	0 29	1 42	17 11	1.5	1 22	2.6
35	5 19	18 50	0 27	1 33	16 54	1.6	1 41	2.5
30	5 26	18 43	0 25	1 26	16 39	1.7	1 56	2.4
20	5 39	18 30	0 23	1 17	16 14	1.9	2 23	2.3
10	5 51	18 19	0 22	1 13	15 53	2.0	2 45	2.2
0	6 1	18 8	0 21	1 11	15 33	2.1	3 6	2.1
10	6 12	17 58	0 22	1 12	15 13	2.2	3 27	2.0
20	6 23	17 47	0 23	1 15	14 51	2.3	3 50	1.9
30	6 35	17 35	0 25	1 21	14 26	2.4	4 16	1.8
35	6 42	17 28	0 26	1 26	14 11	2.5	4 31	1.7
40	6 50	17 20	0 28	1 32	13 54	2.6	4 49	1.7
45	6 60	17 10	0 31	1 39	13 33	2.8	5 10	1.5
50	7 11	16 59	0 34	1 50	13 7	2.9	5 37	1.4
55	7 25	16 45	0 39	2 3	12 31	3.2	6 13	1.1
60	7 44	16 27	0 45	2 23	11 35	3.8	7 11	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 4 53.8	.5	15.8	$T_{\overline{m}}$ 21 45	2.1	54.5	14.9
12	− 4 48.2	$T_{\overline{m}_\odot}$ 12 h 4.8 min		Starost 11.6 d	Faza ◐		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 15	.1	199	-3.8	♃	21 28	.0	75	-2.5
♂	14 18	.1	183	1.7	♄	13 16	.0	199	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 49.3	14 18.6	322 46.9	161 4.3	9 17.9	145 40.1	1 59.4
2	208 49.5	14 17.1	352 51.8	191 3.5	9 15.5	175 42.2	1 58.1
4	238 49.8	14 15.5	22 56.7	221 2.7	9 13.2	205 44.2	1 56.8
6	268 50.0	14 14.0	53 1.7	251 1.9	9 10.8	235 46.3	1 55.5
8	298 50.2	14 12.4	83 6.6	281 1.1	9 8.4	265 48.3	1 54.2
10	328 50.5	14 10.9	113 11.5	311 .3	9 6.0	295 50.4	1 52.9
12	358 50.7	14 9.3	143 16.5	340 59.5	9 3.7	325 52.4	1 51.6
14	28 51.0	14 7.8	173 21.4	10 58.7	9 1.3	355 54.4	1 50.3
16	58 51.2	14 6.2	203 26.3	40 57.9	8 58.9	25 56.5	1 48.9
18	88 51.5	14 4.7	233 31.2	70 57.1	8 56.5	55 58.5	1 47.6
20	118 51.7	14 3.1	263 36.2	100 56.3	8 54.1	86 .6	1 46.3
22	148 51.9	14 1.5	293 41.1	130 55.5	8 51.8	116 2.6	1 45.0
Δ	1	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	32 36.5	106	−24 50.5	67	38 4.1	−23 1.1	161 17.2	9 37.6
2	61 35.8	107	−24 37.1	70	68 9.5	−23 1.2	191 21.6	9 37.4
4	90 35.2	108	−24 23.2	72	98 14.8	−23 1.2	221 25.9	9 37.2
6	119 34.7	109	−24 8.8	74	128 20.2	−23 1.3	251 30.3	9 36.9
8	148 34.4	109	−23 53.9	77	158 25.5	−23 1.3	281 34.6	9 36.7
10	177 34.3	110	−23 38.5	79	188 30.8	−23 1.3	311 39.0	9 36.5
12	206 34.3	111	−23 22.7	82	218 36.2	−23 1.4	341 43.3	9 36.2
14	235 34.5	112	−23 6.4	84	248 41.5	−23 1.4	11 47.7	9 36.0
16	264 34.9	113	−22 49.6	86	278 46.8	−23 1.5	41 52.0	9 35.8
18	293 35.4	114	−22 32.4	88	308 52.2	−23 1.5	71 56.4	9 35.5
20	322 36.1	114	−22 14.7	91	338 57.5	−23 1.6	102 .7	9 35.3
22	351 37.0	115	−21 56.5	93	9 2.8	−23 1.6	132 5.1	9 35.1
Δ					27	0	22	−1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 13	19 55	0 51	: ::	19 31	.2	0 16	3.9
55	4 33	19 35	0 42	2 53	18 52	.6	1 7	3.3
50	4 49	19 20	0 36	2 15	18 25	.9	1 40	3.0
45	5 1	19 8	0 32	1 55	18 4	1.1	2 4	2.8
40	5 11	18 58	0 29	1 42	17 47	1.3	2 24	2.7
35	5 19	18 49	0 27	1 33	17 33	1.4	2 40	2.6
30	5 27	18 42	0 25	1 26	17 21	1.5	2 54	2.5
20	5 40	18 29	0 23	1 17	16 59	1.7	3 18	2.3
10	5 51	18 18	0 22	1 13	16 40	1.9	3 38	2.2
0	6 1	18 8	0 21	1 11	16 23	2.0	3 57	2.1
10	6 11	17 58	0 22	1 12	16 5	2.2	4 16	1.9
20	6 22	17 47	0 23	1 15	15 46	2.3	4 36	1.8
30	6 34	17 35	0 25	1 21	15 25	2.5	4 60	1.6
35	6 41	17 28	0 26	1 26	15 12	2.6	5 13	1.5
40	6 49	17 21	0 28	1 31	14 57	2.7	5 29	1.4
45	6 58	17 11	0 31	1 39	14 39	2.9	5 47	1.3
50	7 9	17 1	0 34	1 49	14 17	3.1	6 10	1.1
55	7 23	16 47	0 38	2 3	13 48	3.4	6 41	.8
60	7 41	16 29	0 45	2 22	13 5	3.9	7 25	.3
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 4 42.7	.5	15.8	$T_{\overline{m}}$	22 35	2.0	54.9	15.0
12	− 4 36.9	$T_{\overline{m}_\odot}$ 12 h	4.6 min	Starost 12.6 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 16	.1	198	−3.8	♃	21 24	.0	75	−2.5
♂	14 16	.1	183	1.7	♄	13 13	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 52.2	14 .0	323 46.0	160 54.7	8 49.4	146 4.7	1 43.7
2	208 52.4	13 58.4	353 51.0	190 53.9	8 47.0	176 6.7	1 42.4
4	238 52.7	13 56.9	23 55.9	220 53.1	8 44.6	206 8.8	1 41.1
6	268 52.9	13 55.3	54 .8	250 52.3	8 42.2	236 10.8	1 39.8
8	298 53.2	13 53.7	84 5.7	280 51.5	8 39.8	266 12.9	1 38.5
10	328 53.4	13 52.1	114 10.7	310 50.7	8 37.4	296 14.9	1 37.2
12	358 53.7	13 50.6	144 15.6	340 49.9	8 35.0	326 17.0	1 35.9
14	28 54.0	13 49.0	174 20.5	10 49.1	8 32.6	356 19.0	1 34.6
16	58 54.2	13 47.4	204 25.5	40 48.3	8 30.2	26 21.1	1 33.3
18	88 54.5	13 45.9	234 30.4	70 47.6	8 27.8	56 23.1	1 32.0
20	118 54.7	13 44.3	264 35.3	100 46.8	8 25.4	86 25.2	1 30.7
22	148 55.0	13 42.7	294 40.2	130 46.0	8 23.0	116 27.2	1 29.4
Δ	1	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	20 38.0	116	−21 38.0	95	39 8.1	−23 1.7	162 9.4	9 34.9
2	49 39.2	117	−21 19.0	97	69 13.5	−23 1.7	192 13.8	9 34.6
4	78 40.6	118	−20 59.5	99	99 18.8	−23 1.8	222 18.1	9 34.4
6	107 42.2	119	−20 39.7	101	129 24.1	−23 1.8	252 22.5	9 34.2
8	136 44.0	120	−20 19.4	103	159 29.4	−23 1.8	282 26.9	9 33.9
10	165 45.9	121	−19 58.7	105	189 34.7	−23 1.9	312 31.2	9 33.7
12	194 48.0	121	−19 37.6	107	219 40.1	−23 1.9	342 35.6	9 33.5
14	223 50.3	122	−19 16.1	109	249 45.4	−23 2.0	12 39.9	9 33.2
16	252 52.8	123	−18 54.2	111	279 50.7	−23 2.0	42 44.3	9 33.0
18	281 55.4	124	−18 32.0	113	309 56.0	−23 2.1	72 48.6	9 32.8
20	310 58.2	125	−18 9.4	115	340 1.3	−23 2.1	102 53.0	9 32.5
22	340 1.2	126	−17 46.3	117	10 6.6	−23 2.2	132 57.3	9 32.3
Δ					27	0	22	−1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 15	19 52	0 51	: ::	19 35	.1	1 50	3.9
55	4 35	19 33	0 42	2 50	19 8	.5	2 27	3.4
50	4 50	19 18	0 36	2 14	18 48	.8	2 52	3.1
45	5 2	19 6	0 32	1 54	18 32	1.0	3 12	2.9
40	5 12	18 56	0 29	1 41	18 19	1.1	3 28	2.8
35	5 20	18 48	0 27	1 32	18 7	1.3	3 42	2.6
30	5 28	18 41	0 25	1 26	17 57	1.4	3 53	2.5
20	5 40	18 28	0 23	1 17	17 40	1.6	4 13	2.3
10	5 51	18 18	0 22	1 13	17 25	1.8	4 30	2.1
0	6 1	18 8	0 21	1 11	17 11	1.9	4 46	2.0
10	6 11	17 58	0 22	1 11	16 57	2.1	5 2	1.8
20	6 21	17 48	0 23	1 15	16 42	2.3	5 19	1.7
30	6 33	17 36	0 25	1 21	16 24	2.5	5 38	1.5
35	6 40	17 29	0 26	1 25	16 14	2.6	5 50	1.3
40	6 48	17 21	0 28	1 31	16 2	2.8	6 2	1.2
45	6 57	17 13	0 30	1 39	15 48	2.9	6 18	1.0
50	7 8	17 2	0 34	1 49	15 31	3.2	6 36	.8
55	7 21	16 49	0 38	2 3	15 9	3.5	6 59	.6
60	7 38	16 31	0 45	2 22	14 39	3.9	7 32	.1
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	− 4 31.0	.5	15.8	$T_{\overline{m}}$	23 23	1.9	55.4	15.1
12	− 4 24.9	$T_{\overline{m}_\odot}$ 12 h	4.4 min	Starost 13.6 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 17	.1	197	−3.8	♃	21 20	.0	75	−2.5
♂	14 15	.1	182	1.7	♄	13 9	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 55.2	13 41.1	324 45.2	160 45.2	8 20.6	146 29.2	1 28.1
2	208 55.5	13 39.5	354 50.1	190 44.4	8 18.2	176 31.3	1 26.8
4	238 55.8	13 38.0	24 55.0	220 43.7	8 15.8	206 33.3	1 25.5
6	268 56.0	13 36.4	55 .0	250 42.9	8 13.4	236 35.4	1 24.2
8	298 56.3	13 34.8	85 4.9	280 42.1	8 11.0	266 37.4	1 22.9
10	328 56.5	13 33.2	115 9.8	310 41.3	8 8.6	296 39.5	1 21.6
12	358 56.8	13 31.6	145 14.7	340 40.6	8 6.1	326 41.5	1 20.3
14	28 57.1	13 30.0	175 19.7	10 39.8	8 3.7	356 43.5	1 18.9
16	58 57.3	13 28.4	205 24.6	40 39.0	8 1.3	26 45.6	1 17.6
18	88 57.6	13 26.8	235 29.5	70 38.2	7 58.9	56 47.6	1 16.3
20	118 57.9	13 25.2	265 34.5	100 37.5	7 56.5	86 49.7	1 15.0
22	148 58.2	13 23.6	295 39.4	130 36.7	7 54.1	116 51.7	1 13.7
Δ	1	-8		-4	-12	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	9 4.3	127	-17 23.0	119	40 11.9	-23 2.2	163 1.7	9 32.1
2	38 7.6	127	-16 59.3	120	70 17.3	-23 2.2	193 6.0	9 31.9
4	67 11.1	128	-16 35.2	122	100 22.6	-23 2.3	223 10.4	9 31.6
6	96 14.7	129	-16 10.8	124	130 27.9	-23 2.3	253 14.7	9 31.4
8	125 18.5	130	-15 46.1	125	160 33.2	-23 2.4	283 19.1	9 31.2
10	154 22.4	130	-15 21.0	127	190 38.5	-23 2.4	313 23.4	9 30.9
12	183 26.5	131	-14 55.6	128	220 43.8	-23 2.5	343 27.8	9 30.7
14	212 30.7	132	-14 30.0	130	250 49.1	-23 2.5	13 32.1	9 30.5
16	241 35.1	132	-14 4.0	131	280 54.4	-23 2.5	43 36.5	9 30.2
18	270 39.5	133	-13 37.7	133	310 59.7	-23 2.6	73 40.8	9 30.0
20	299 44.2	134	-13 11.1	134	341 5.0	-23 2.6	103 45.2	9 29.8
22	328 48.9	134	-12 44.3	136	11 10.3	-23 2.7	133 49.5	9 29.5
Δ					27	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 17	19 49	0 50	: ::	19 37	.0	3 24	3.9
55	4 37	19 30	0 41	2 47	19 20	.4	3 49	3.5
50	4 52	19 16	0 36	2 13	19 6	.6	4 8	3.2
45	5 3	19 4	0 32	1 53	18 55	.9	4 22	2.9
40	5 13	18 55	0 29	1 41	18 46	1.0	4 34	2.8
35	5 21	18 47	0 27	1 32	18 38	1.2	4 44	2.6
30	5 28	18 40	0 25	1 25	18 31	1.3	4 53	2.5
20	5 40	18 28	0 23	1 17	18 19	1.5	5 8	2.3
10	5 51	18 17	0 22	1 12	18 8	1.7	5 22	2.1
0	6 1	18 8	0 21	1 11	17 58	1.9	5 34	1.9
10	6 11	17 58	0 22	1 11	17 48	2.1	5 46	1.7
20	6 21	17 48	0 23	1 14	17 37	2.3	5 59	1.5
30	6 32	17 36	0 25	1 21	17 24	2.5	6 13	1.3
35	6 39	17 30	0 26	1 25	17 17	2.6	6 22	1.2
40	6 47	17 22	0 28	1 31	17 9	2.8	6 31	1.1
45	6 55	17 14	0 30	1 39	16 59	2.9	6 43	.9
50	7 6	17 3	0 34	1 49	16 47	3.2	6 56	.7
55	7 19	16 51	0 38	2 3	16 32	3.4	7 13	.4
60	7 36	16 34	0 45	2 22	16 12	3.8	7 35	.1
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 18.9	.5	15.8	$T_{\overline{m}}$	.. ..	1.0	55.9	15.2
12	- 4 12.5	$T_{\overline{m}_\odot}$	12 h 4.2 min	Starost 14.6 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 17	.1	196	-3.8	♃	21 15	.0	75	-2.5
♂	14 13	.1	182	1.7	♄	13 6	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	178 58.4	13 22.0	325 44.3	160 35.9	7 51.6	146 53.8	1 12.4
2	208 58.7	13 20.4	355 49.2	190 35.2	7 49.2	176 55.8	1 11.1
4	238 59.0	13 18.8	25 54.2	220 34.4	7 46.8	206 57.8	1 9.8
6	268 59.2	13 17.2	55 59.1	250 33.7	7 44.4	236 59.9	1 8.5
8	298 59.5	13 15.6	86 4.0	280 32.9	7 41.9	267 1.9	1 7.2
10	328 59.8	13 14.0	116 9.0	310 32.1	7 39.5	297 4.0	1 5.9
12	359 .1	13 12.4	146 13.9	340 31.4	7 37.1	327 6.0	1 4.6
14	29 .3	13 10.8	176 18.8	10 30.6	7 34.6	357 8.0	1 3.3
16	59 .6	13 9.2	206 23.7	40 29.9	7 32.2	27 10.1	1 2.0
18	89 .9	13 7.6	236 28.7	70 29.1	7 29.8	57 12.1	1 .6
20	119 1.2	13 6.0	266 33.6	100 28.4	7 27.3	87 14.2	0 59.3
22	149 1.4	13 4.4	296 38.5	130 27.6	7 24.9	117 16.2	0 58.0
Δ	1	-8		-4	-12	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	357 53.8	135	-12 17.2	137	41 15.6	-23 2.7	163 53.9	9 29.3
2	26 58.7	135	-11 49.8	138	71 20.9	-23 2.7	193 58.2	9 29.1
4	56 3.8	136	-11 22.2	139	101 26.2	-23 2.8	224 2.6	9 28.8
6	85 9.0	136	-10 54.3	140	131 31.5	-23 2.8	254 6.9	9 28.6
8	114 14.3	137	-10 26.2	142	161 36.8	-23 2.9	284 11.3	9 28.4
10	143 19.6	137	- 9 57.9	143	191 42.0	-23 2.9	314 15.6	9 28.2
12	172 25.1	138	- 9 29.3	144	221 47.3	-23 3.0	344 20.0	9 27.9
14	201 30.6	138	- 9 .6	145	251 52.6	-23 3.0	14 24.3	9 27.7
16	230 36.1	138	- 8 31.6	146	281 57.9	-23 3.0	44 28.7	9 27.5
18	259 41.8	138	- 8 2.5	147	312 3.2	-23 3.1	74 33.0	9 27.2
20	288 47.5	139	- 7 33.1	148	342 8.5	-23 3.1	104 37.4	9 27.0
22	317 53.2	139	- 7 3.6	148	12 13.8	-23 3.2	134 41.7	9 26.8
Δ					26	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 20	19 47	0 50	: ::	19 38	.0	4 57	3.8
55	4 39	19 28	0 41	2 45	19 29	.3	5 12	3.4
50	4 53	19 14	0 35	2 12	19 21	.6	5 24	3.2
45	5 4	19 3	0 32	1 53	19 15	.8	5 33	3.0
40	5 14	18 54	0 29	1 40	19 10	1.0	5 41	2.8
35	5 22	18 46	0 27	1 32	19 6	1.1	5 47	2.6
30	5 29	18 39	0 25	1 25	19 2	1.2	5 53	2.5
20	5 41	18 27	0 23	1 17	18 55	1.5	6 3	2.3
10	5 51	18 17	0 22	1 12	18 49	1.7	6 12	2.1
0	6 1	18 7	0 21	1 11	18 43	1.9	6 20	1.9
10	6 10	17 58	0 22	1 11	18 37	2.1	6 27	1.7
20	6 20	17 48	0 23	1 14	18 31	2.3	6 36	1.5
30	6 31	17 37	0 25	1 21	18 24	2.5	6 45	1.3
35	6 38	17 31	0 26	1 25	18 20	2.6	6 51	1.1
40	6 45	17 23	0 28	1 31	18 15	2.8	6 57	1.0
45	6 54	17 15	0 30	1 39	18 10	3.0	7 4	.8
50	7 4	17 5	0 34	1 49	18 3	3.2	7 13	.6
55	7 16	16 52	0 38	2 3	17 55	3.5	7 23	.4
60	7 33	16 36	0 44	2 21	17 44	3.8	7 37	.0
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	- 4 6.1	.6	15.8	$T_{\overline{m}}$	0 9	1.9	56.4	15.4
12	- 3 59.5	$T_{\overline{m}_\odot}$	12 h 4.0 min	Starost 15.6 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 18	.1	195	-3.8	♃	21 11	.0	76	-2.5
♂	14 11	.1	181	1.7	♄	13 3	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 1.7	13 2.8	326 43.4	160 26.8	7 22.4	147 18.2	0 56.7
2	209 2.0	13 1.1	356 48.4	190 26.1	7 20.0	177 20.3	0 55.4
4	239 2.3	12 59.5	26 53.3	220 25.3	7 17.6	207 22.3	0 54.1
6	269 2.6	12 57.9	56 58.2	250 24.6	7 15.1	237 24.3	0 52.8
8	299 2.9	12 56.3	87 3.2	280 23.9	7 12.7	267 26.4	0 51.5
10	329 3.1	12 54.7	117 8.1	310 23.1	7 10.2	297 28.4	0 50.2
12	359 3.4	12 53.0	147 13.0	340 22.4	7 7.8	327 30.5	0 48.9
14	29 3.7	12 51.4	177 17.9	10 21.6	7 5.3	357 32.5	0 47.6
16	59 4.0	12 49.8	207 22.9	40 20.9	7 2.9	27 34.5	0 46.2
18	89 4.3	12 48.1	237 27.8	70 20.1	7 .4	57 36.6	0 44.9
20	119 4.6	12 46.5	267 32.7	100 19.4	6 58.0	87 38.6	0 43.6
22	149 4.9	12 44.9	297 37.7	130 18.7	6 55.5	117 40.6	0 42.3
Δ	1	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	346 59.0	139	− 6 33.9	149	42 19.0	−23 3.2	164 46.1	9 26.5
2	16 4.8	139	− 6 4.1	150	72 24.3	−23 3.2	194 50.4	9 26.3
4	45 10.7	139	− 5 34.1	151	102 29.6	−23 3.3	224 54.8	9 26.1
6	74 16.5	139	− 5 4.0	151	132 34.9	−23 3.3	254 59.1	9 25.8
8	103 22.4	139	− 4 33.7	152	162 40.2	−23 3.4	285 3.5	9 25.6
10	132 28.2	139	− 4 3.3	153	192 45.4	−23 3.4	315 7.8	9 25.4
12	161 34.1	139	− 3 32.8	153	222 50.7	−23 3.4	345 12.2	9 25.1
14	190 39.9	139	− 3 2.2	154	252 56.0	−23 3.5	15 16.5	9 24.9
16	219 45.7	139	− 2 31.5	154	283 1.2	−23 3.5	45 20.9	9 24.7
18	248 51.5	139	− 2 .7	154	313 6.5	−23 3.6	75 25.2	9 24.4
20	277 57.3	138	− 1 29.8	155	343 11.8	−23 3.6	105 29.6	9 24.2
22	307 2.9	138	− 0 58.9	155	13 17.1	−23 3.6	135 33.9	9 24.0
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 22	19 44	0 49	: ::	19 39	.0	6 29	3.8
55	4 41	19 26	0 41	2 42	19 37	.3	6 35	3.5
50	4 55	19 12	0 35	2 10	19 36	.6	6 40	3.2
45	5 6	19 1	0 31	1 52	19 34	.8	6 44	3.0
40	5 15	18 52	0 29	1 40	19 33	1.0	6 47	2.8
35	5 22	18 45	0 27	1 31	19 32	1.1	6 50	2.6
30	5 29	18 38	0 25	1 25	19 32	1.3	6 53	2.5
20	5 41	18 26	0 23	1 17	19 30	1.5	6 57	2.3
10	5 51	18 16	0 22	1 12	19 29	1.7	7 1	2.1
0	6 0	18 7	0 21	1 10	19 28	1.9	7 4	1.9
10	6 10	17 58	0 21	1 11	19 27	2.1	7 8	1.7
20	6 19	17 48	0 23	1 14	19 25	2.3	7 11	1.5
30	6 30	17 38	0 24	1 21	19 24	2.5	7 16	1.2
35	6 37	17 31	0 26	1 25	19 23	2.7	7 18	1.1
40	6 44	17 24	0 28	1 31	19 22	2.8	7 21	1.0
45	6 52	17 16	0 30	1 39	19 21	3.0	7 24	.8
50	7 2	17 6	0 33	1 49	19 20	3.2	7 27	.6
55	7 14	16 54	0 38	2 2	19 18	3.5	7 32	.3
60	7 30	16 38	0 44	2 21	19 16	3.9	7 38	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 52.9	.6	15.8	$T_{\overline{m}}$ 0 54	1.8	56.9	15.5
12	− 3 46.0	$T_{\overline{m}_\odot}$ 12 h 3.8 min		Starost 16.6 d		Faza ❍	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 19	.1	194	−3.8	♃	21 7	.0	76	−2.4
♂	14 10	.1	181	1.7	♄	12 59	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 5.2	12 43.3	327 42.6	160 17.9	6 53.1	147 42.7	0 41.0
2	209 5.5	12 41.6	357 47.5	190 17.2	6 50.6	177 44.7	0 39.7
4	239 5.7	12 40.0	27 52.4	220 16.4	6 48.2	207 46.7	0 38.4
6	269 6.0	12 38.4	57 57.4	250 15.7	6 45.7	237 48.8	0 37.1
8	299 6.3	12 36.7	88 2.3	280 15.0	6 43.2	267 50.8	0 35.8
10	329 6.6	12 35.1	118 7.2	310 14.2	6 40.8	297 52.8	0 34.5
12	359 6.9	12 33.4	148 12.2	340 13.5	6 38.3	327 54.9	0 33.1
14	29 7.2	12 31.8	178 17.1	10 12.8	6 35.8	357 56.9	0 31.8
16	59 7.5	12 30.1	208 22.0	40 12.1	6 33.4	27 58.9	0 30.5
18	89 7.8	12 28.5	238 26.9	70 11.3	6 30.9	58 1.0	0 29.2
20	119 8.1	12 26.9	268 31.9	100 10.6	6 28.4	88 3.0	0 27.9
22	149 8.4	12 25.2	298 36.8	130 9.9	6 26.0	118 5.0	0 26.6
Δ	1	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 8.6	138	− 0 27.9	155	43 22.3	−23 3.7	165 38.2	9 23.7
2	5 14.1	137	0 3.1	155	73 27.6	−23 3.7	195 42.6	9 23.5
4	34 19.6	137	0 34.2	156	103 32.8	−23 3.7	225 46.9	9 23.3
6	63 25.0	136	1 5.3	156	133 38.1	−23 3.8	255 51.3	9 23.0
8	92 30.3	136	1 36.4	156	163 43.4	−23 3.8	285 55.6	9 22.8
10	121 35.5	135	2 7.6	156	193 48.6	−23 3.9	315 60.0	9 22.6
12	150 40.6	135	2 38.7	156	223 53.9	−23 3.9	346 4.3	9 22.3
14	179 45.5	134	3 9.8	156	253 59.1	−23 3.9	16 8.7	9 22.1
16	208 50.3	133	3 40.9	155	284 4.4	−23 4.0	46 13.0	9 21.9
18	237 55.0	133	4 12.0	155	314 9.7	−23 4.0	76 17.4	9 21.6
20	266 59.6	132	4 43.0	155	344 14.9	−23 4.1	106 21.7	9 21.4
22	296 3.9	131	5 14.0	155	14 20.2	−23 4.1	136 26.1	9 21.2
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 25	19 41	0 49	: ::	19 40	.0	8 0	3.9
55	4 42	19 23	0 41	2 40	19 45	.4	7 58	3.5
50	4 56	19 10	0 35	2 9	19 50	.6	7 57	3.3
45	5 7	18 60	0 31	1 52	19 54	.9	7 56	3.0
40	5 16	18 51	0 29	1 40	19 57	1.0	7 55	2.9
35	5 23	18 43	0 26	1 31	19 59	1.2	7 54	2.7
30	5 30	18 37	0 25	1 25	20 2	1.3	7 53	2.6
20	5 41	18 26	0 23	1 16	20 6	1.6	7 51	2.3
10	5 51	18 16	0 22	1 12	20 9	1.8	7 50	2.1
0	6 0	18 7	0 21	1 10	20 13	2.0	7 49	1.9
10	6 9	17 58	0 21	1 11	20 16	2.2	7 48	1.7
20	6 19	17 49	0 22	1 14	20 20	2.4	7 47	1.5
30	6 29	17 38	0 24	1 20	20 25	2.6	7 45	1.3
35	6 35	17 32	0 26	1 25	20 27	2.7	7 45	1.1
40	6 42	17 25	0 28	1 31	20 30	2.9	7 44	1.0
45	6 50	17 17	0 30	1 39	20 33	3.1	7 43	.8
50	7 0	17 8	0 33	1 49	20 37	3.3	7 41	.6
55	7 12	16 56	0 38	2 2	20 42	3.6	7 40	.4
60	7 27	16 41	0 44	2 21	20 48	4.0	7 38	.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	− 3 39.2	.6	15.8	$T_{\overline{m}}$ 1 38	1.9	57.4	15.7
12	− 3 32.1	$T_{\overline{m}_\odot}$ 12 h 3.5 min		Starost 17.6 d		Faza ❍	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 19	.1	193	−3.8	♃	21 3	.0	76	−2.4
♂	14 8	.1	180	1.7	♄	12 56	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 8.7	12 23.6	328 41.7	160 9.2	6 23.5	148 7.0	0 25.3
2	209 9.0	12 21.9	358 46.7	190 8.4	6 21.0	178 9.1	0 24.0
4	239 9.3	12 20.3	28 51.6	220 7.7	6 18.6	208 11.1	0 22.6
6	269 9.6	12 18.6	58 56.5	250 7.0	6 16.1	238 13.1	0 21.3
8	299 9.9	12 16.9	89 1.4	280 6.3	6 13.6	268 15.2	0 20.0
10	329 10.2	12 15.3	119 6.4	310 5.5	6 11.1	298 17.2	0 18.7
12	359 10.5	12 13.6	149 11.3	340 4.8	6 8.7	328 19.2	0 17.4
14	29 10.8	12 12.0	179 16.2	10 4.1	6 6.2	358 21.3	0 16.1
16	59 11.1	12 10.3	209 21.2	40 3.4	6 3.7	28 23.3	0 14.8
18	89 11.5	12 8.7	239 26.1	70 2.7	6 1.2	58 25.3	0 13.5
20	119 11.8	12 7.0	269 31.0	100 2.0	5 58.7	88 27.3	0 12.1
22	149 12.1	12 5.3	299 35.9	130 1.2	5 56.2	118 29.4	0 10.8
Δ	2	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 8.1	130	5 44.9	154	44 25.4	−23 4.1	166 30.4	9 20.9
2	354 12.2	129	6 15.8	154	74 30.7	−23 4.2	196 34.8	9 20.7
4	23 16.0	128	6 46.5	153	104 35.9	−23 4.2	226 39.1	9 20.5
6	52 19.6	127	7 17.2	153	134 41.2	−23 4.2	256 43.4	9 20.2
8	81 23.1	126	7 47.8	152	164 46.4	−23 4.3	286 47.8	9 20.0
10	110 26.3	125	8 18.2	152	194 51.6	−23 4.3	316 52.1	9 19.8
12	139 29.3	124	8 48.5	151	224 56.9	−23 4.3	346 56.5	9 19.6
14	168 32.0	123	9 18.7	150	255 2.1	−23 4.4	17 .8	9 19.3
16	197 34.5	121	9 48.8	149	285 7.4	−23 4.4	47 5.2	9 19.1
18	226 36.8	120	10 18.6	149	315 12.6	−23 4.5	77 9.5	9 18.9
20	255 38.8	119	10 48.3	148	345 17.8	−23 4.5	107 13.9	9 18.6
22	284 40.5	117	11 17.8	147	15 23.1	−23 4.5	137 18.2	9 18.4
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 27	19 38	0 49	: ::	19 41	.1	9 34	4.1
55	4 44	19 21	0 40	2 38	19 55	.5	9 23	3.7
50	4 57	19 8	0 35	2 8	20 6	.8	9 15	3.4
45	5 8	18 58	0 31	1 51	20 14	1.0	9 9	3.1
40	5 17	18 49	0 29	1 39	20 22	1.2	9 3	2.9
35	5 24	18 42	0 26	1 31	20 28	1.3	8 58	2.8
30	5 30	18 36	0 25	1 25	20 33	1.5	8 54	2.6
20	5 41	18 25	0 23	1 16	20 43	1.7	8 47	2.4
10	5 51	18 15	0 22	1 12	20 52	1.9	8 41	2.2
0	5 60	18 7	0 21	1 10	20 60	2.1	8 35	2.0
10	6 9	17 58	0 21	1 11	21 8	2.3	8 29	1.8
20	6 18	17 49	0 22	1 14	21 17	2.5	8 23	1.6
30	6 28	17 39	0 24	1 20	21 27	2.7	8 16	1.4
35	6 34	17 33	0 26	1 25	21 33	2.8	8 12	1.2
40	6 41	17 26	0 28	1 31	21 40	3.0	8 8	1.1
45	6 49	17 18	0 30	1 38	21 47	3.2	8 2	.9
50	6 58	17 9	0 33	1 49	21 57	3.4	7 56	.7
55	7 10	16 58	0 38	2 2	22 9	3.8	7 48	.4
60	7 25	16 43	0 44	2 21	22 24	4.2	7 39	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 3 25.0	.6	15.8	$T_{\overline{m}}$	2 24	2.0	57.9	15.8
12	− 3 17.6	$T_{\overline{m}_\odot}$ 12 h	3.3 min	Starost 18.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 20	.1	191	−3.8	♆	20 59	.0	76	−2.4
♂	14 7	.1	179	1.7	♇	12 52	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 12.4	12 3.7	329 40.9	160 .5	5 53.8	148 31.4	0 9.5
2	209 12.7	12 2.0	359 45.8	189 59.8	5 51.3	178 33.4	0 8.2
4	239 13.0	12 .3	29 50.7	219 59.1	5 48.8	208 35.4	0 6.9
6	269 13.3	11 58.7	59 55.6	249 58.4	5 46.3	238 37.5	0 5.6
8	299 13.6	11 57.0	90 .6	279 57.7	5 43.8	268 39.5	0 4.3
10	329 13.9	11 55.3	120 5.5	309 57.0	5 41.3	298 41.5	0 3.0
12	359 14.3	11 53.6	150 10.4	339 56.3	5 38.8	328 43.5	0 1.6
14	29 14.6	11 52.0	180 15.4	9 55.6	5 36.3	358 45.6	0 .3
16	59 14.9	11 50.3	210 20.3	39 54.9	5 33.8	28 47.6	− 0 1.0
18	89 15.2	11 48.6	240 25.2	69 54.2	5 31.3	58 49.6	− 0 2.3
20	119 15.5	11 46.9	270 30.1	99 53.4	5 28.9	88 51.6	− 0 3.6
22	149 15.8	11 45.3	300 35.1	129 52.7	5 26.4	118 53.7	− 0 4.9
Δ	2	−8		−4	−12	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	313 42.0	116	11 47.2	146	45 28.3	−23 4.6	167 22.6	9 18.1
2	342 43.2	114	12 16.3	144	75 33.6	−23 4.6	197 26.9	9 17.9
4	11 44.0	113	12 45.2	143	105 38.8	−23 4.6	227 31.2	9 17.7
6	40 44.6	111	13 13.8	142	135 44.0	−23 4.7	257 35.6	9 17.4
8	69 44.8	110	13 42.2	141	165 49.2	−23 4.7	287 39.9	9 17.2
10	98 44.8	108	14 10.4	139	195 54.5	−23 4.7	317 44.3	9 17.0
12	127 44.4	106	14 38.3	138	225 59.7	−23 4.8	347 48.6	9 16.7
14	156 43.7	105	15 5.9	137	256 4.9	−23 4.8	17 53.0	9 16.5
16	185 42.6	103	15 33.2	135	286 10.2	−23 4.8	47 57.3	9 16.3
18	214 41.2	101	16 .3	134	316 15.4	−23 4.9	78 1.7	9 16.0
20	243 39.4	99	16 27.0	132	346 20.6	−23 4.9	108 6.0	9 15.8
22	272 37.3	97	16 53.3	130	16 25.8	−23 4.9	138 10.3	9 15.6
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 29	19 35	0 48	3 57	19 43	.2	11 12	4.3
55	4 46	19 19	0 40	2 36	20 6	.7	10 52	3.8
50	4 59	19 6	0 35	2 8	20 24	1.0	10 36	3.5
45	5 9	18 56	0 31	1 50	20 38	1.2	10 24	3.2
40	5 18	18 48	0 28	1 39	20 50	1.4	10 14	3.1
35	5 25	18 41	0 26	1 31	20 60	1.5	10 5	2.9
30	5 31	18 35	0 25	1 24	21 8	1.7	9 58	2.8
20	5 42	18 24	0 23	1 16	21 24	1.9	9 45	2.5
10	5 51	18 15	0 21	1 12	21 37	2.1	9 34	2.3
0	5 60	18 6	0 21	1 10	21 50	2.2	9 23	2.2
10	6 8	17 58	0 21	1 11	22 2	2.4	9 13	2.0
20	6 17	17 49	0 22	1 14	22 16	2.6	9 2	1.8
30	6 27	17 39	0 24	1 20	22 32	2.8	8 49	1.6
35	6 33	17 33	0 26	1 25	22 41	2.9	8 42	1.4
40	6 40	17 27	0 28	1 31	22 52	3.1	8 34	1.3
45	6 47	17 20	0 30	1 38	23 4	3.3	8 24	1.1
50	6 56	17 11	0 33	1 48	23 19	3.5	8 13	.9
55	7 7	16 60	0 38	2 2	23 39	3.9	7 59	.6
60	7 22	16 45	0 44	2 20	.. ..	.0	7 40	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 3 10.3	.6	15.8	$T_{\overline{m}}$	3 11	2.1	58.3	15.9
12	− 3 2.7	$T_{\overline{m}_\odot}$ 12 h	3.0 min	Starost 19.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 20	.1	190	−3.8	♆	20 54	.0	76	−2.4
♂	14 5	.1	179	1.7	♇	12 49	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 16.2	11 43.6	330 40.0	159 52.0	5 23.9	148 55.7	− 0 6.2
2	209 16.5	11 41.9	0 44.9	189 51.3	5 21.4	178 57.7	− 0 7.6
4	239 16.8	11 40.2	30 49.9	219 50.6	5 18.9	208 59.7	− 0 8.9
6	269 17.1	11 38.5	60 54.8	249 49.9	5 16.4	239 1.7	− 0 10.2
8	299 17.4	11 36.8	90 59.7	279 49.2	5 13.9	269 3.8	− 0 11.5
10	329 17.8	11 35.1	121 4.6	309 48.5	5 11.4	299 5.8	− 0 12.8
12	359 18.1	11 33.5	151 9.6	339 47.8	5 8.8	329 7.8	− 0 14.1
14	29 18.4	11 31.8	181 14.5	9 47.2	5 6.3	359 9.8	− 0 15.5
16	59 18.7	11 30.1	211 19.4	39 46.5	5 3.8	29 11.8	− 0 16.8
18	89 19.1	11 28.4	241 24.4	69 45.8	5 1.3	59 13.9	− 0 18.1
20	119 19.4	11 26.7	271 29.3	99 45.1	4 58.8	89 15.9	− 0 19.4
22	149 19.7	11 25.0	301 34.2	129 44.4	4 56.3	119 17.9	− 0 20.7
Δ	2	−8		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	301 34.7	96	17 19.4	128	46 31.0	−23 5.0	168 14.7	9 15.3
2	330 31.9	94	17 45.0	127	76 36.3	−23 5.0	198 19.0	9 15.1
4	359 28.6	92	18 10.3	125	106 41.5	−23 5.0	228 23.4	9 14.9
6	28 25.0	90	18 35.2	123	136 46.7	−23 5.1	258 27.7	9 14.6
8	57 20.9	88	18 59.8	121	166 51.9	−23 5.1	288 32.1	9 14.4
10	86 16.5	86	19 23.9	118	196 57.1	−23 5.1	318 36.4	9 14.2
12	115 11.7	84	19 47.6	116	227 2.3	−23 5.2	348 40.8	9 13.9
14	144 6.5	82	20 10.8	114	257 7.5	−23 5.2	18 45.1	9 13.7
16	173 .9	80	20 33.6	112	287 12.7	−23 5.2	48 49.4	9 13.5
18	201 54.9	78	20 55.9	109	317 17.9	−23 5.3	78 53.8	9 13.2
20	230 48.4	76	21 17.8	107	347 23.2	−23 5.3	108 58.1	9 13.0
22	259 41.6	74	21 39.2	104	17 28.4	−23 5.3	139 2.5	9 12.8
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 32	19 32	0 48	3 44	19 48	.4	12 56	4.5
55	4 48	19 16	0 40	2 34	20 23	1.0	12 23	3.9
50	5 0	19 4	0 35	2 7	20 48	1.4	11 60	3.5
45	5 10	18 54	0 31	1 50	21 7	1.6	11 42	3.3
40	5 18	18 46	0 28	1 38	21 23	1.7	11 27	3.1
35	5 25	18 40	0 26	1 30	21 37	1.9	11 15	3.0
30	5 32	18 34	0 25	1 24	21 49	2.0	11 4	2.8
20	5 42	18 23	0 23	1 16	22 9	2.1	10 46	2.6
10	5 51	18 14	0 21	1 12	22 27	2.3	10 30	2.5
0	5 59	18 6	0 21	1 10	22 43	2.4	10 15	2.3
10	6 8	17 58	0 21	1 11	23 0	2.5	10 0	2.2
20	6 16	17 49	0 22	1 14	23 18	2.7	9 44	2.0
30	6 26	17 40	0 24	1 20	23 39	2.9	9 26	1.8
35	6 32	17 34	0 26	1 25	23 52	3.0	9 16	1.7
40	6 38	17 28	0 28	1 31	. . .	.0	9 4	1.5
45	6 45	17 21	0 30	1 38	. . .	.0	8 50	1.4
50	6 54	17 12	0 33	1 48	. . .	.0	8 33	1.1
55	7 5	17 1	0 37	2 2	. . .	.0	8 12	.8
60	7 19	16 47	0 43	2 20	0 7	4.4	7 43	.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 55.2	.6	15.8	$T_{\overline{m}}$	4 2	2.3	58.7	16.0
12	− 2 47.4	$T_{\overline{m}_\odot}$ 12 h	2.8 min	Starost 20.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 21	.1	189	−3.8	♄	20 50	.0	76	−2.4
♂	14 3	.1	178	1.7	♃	12 45	.0	198	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 20.0	11 23.3	331 39.1	159 43.7	4 53.8	149 19.9	− 0 22.0
2	209 20.4	11 21.6	1 44.1	189 43.0	4 51.3	179 21.9	− 0 23.4
4	239 20.7	11 19.9	31 49.0	219 42.3	4 48.8	209 24.0	− 0 24.7
6	269 21.0	11 18.2	61 53.9	249 41.6	4 46.3	239 26.0	− 0 26.0
8	299 21.4	11 16.5	91 58.9	279 40.9	4 43.8	269 28.0	− 0 27.3
10	329 21.7	11 14.8	122 3.8	309 40.2	4 41.2	299 30.0	− 0 28.6
12	359 22.0	11 13.1	152 8.7	339 39.5	4 38.7	329 32.0	− 0 29.9
14	29 22.4	11 11.4	182 13.6	9 38.9	4 36.2	359 34.0	− 0 31.3
16	59 22.7	11 9.7	212 18.6	39 38.2	4 33.7	29 36.1	− 0 32.6
18	89 23.0	11 8.0	242 23.5	69 37.5	4 31.2	59 38.1	− 0 33.9
20	119 23.4	11 6.3	272 28.4	99 36.8	4 28.7	89 40.1	− 0 35.2
22	149 23.7	11 4.6	302 33.4	129 36.1	4 26.1	119 42.1	− 0 36.5
Δ	2	−9		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	288 34.4	72	22 .1	102	47 33.6	−23 5.4	169 6.8	9 12.5
2	317 26.8	70	22 20.4	99	77 38.8	−23 5.4	199 11.2	9 12.3
4	346 18.8	68	22 40.3	97	107 44.0	−23 5.4	229 15.5	9 12.1
6	15 10.3	66	22 59.6	94	137 49.2	−23 5.5	259 19.8	9 11.8
8	44 1.5	64	23 18.3	91	167 54.4	−23 5.5	289 24.2	9 11.6
10	72 52.3	62	23 36.5	88	197 59.6	−23 5.5	319 28.5	9 11.4
12	101 42.7	60	23 54.1	85	228 4.8	−23 5.6	349 32.9	9 11.1
14	130 32.7	58	24 11.1	82	258 9.9	−23 5.6	19 37.2	9 10.9
16	159 22.4	56	24 27.5	79	288 15.1	−23 5.6	49 41.6	9 10.7
18	188 11.7	55	24 43.3	76	318 20.3	−23 5.6	79 45.9	9 10.4
20	217 .6	53	24 58.5	73	348 25.5	−23 5.7	109 50.2	9 10.2
22	245 49.1	51	25 13.0	69	18 30.7	−23 5.7	139 54.6	9 10.0
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 34	19 29	0 47	3 35	19 59	1.0	14 43	4.3
55	4 50	19 14	0 40	2 32	20 47	1.6	13 56	3.6
50	5 2	19 2	0 35	2 6	21 20	1.9	13 24	3.3
45	5 12	18 53	0 31	1 49	21 45	2.0	13 0	3.2
40	5 19	18 45	0 28	1 38	22 5	2.1	12 42	3.0
35	5 26	18 38	0 26	1 30	22 21	2.2	12 26	2.9
30	5 32	18 32	0 25	1 24	22 36	2.3	12 12	2.9
20	5 42	18 23	0 23	1 16	23 0	2.4	11 49	2.7
10	5 51	18 14	0 21	1 12	23 21	2.5	11 29	2.6
0	5 59	18 6	0 21	1 10	23 41	2.6	11 11	2.5
10	6 7	17 58	0 21	1 11	. . .	.0	10 52	2.4
20	6 16	17 50	0 22	1 14	. . .	.0	10 32	2.3
30	6 25	17 40	0 24	1 20	. . .	.0	10 10	2.1
35	6 31	17 35	0 26	1 25	. . .	.0	9 56	2.0
40	6 37	17 29	0 28	1 31	0 6	3.1	9 41	1.9
45	6 44	17 22	0 30	1 38	0 23	3.3	9 23	1.8
50	6 52	17 14	0 33	1 48	0 45	3.5	9 1	1.6
55	7 3	17 3	0 37	2 1	1 13	3.8	8 31	1.3
60	7 16	16 50	0 43	2 20	1 54	4.5	7 49	.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 39.6	.7	15.8	$T_{\overline{m}}$	4 57	2.5	59.0	16.1
12	− 2 31.7	$T_{\overline{m}_\odot}$ 12 h	2.5 min	Starost 21.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 21	.1	188	−3.8	♄	20 46	.0	76	−2.4
♂	14 2	.1	178	1.7	♃	12 42	.0	197	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 24.0	11 2.8	332 38.3	159 35.4	4 23.6	149 44.1	− 0 37.8
2	209 24.4	11 1.1	2 43.2	189 34.8	4 21.1	179 46.1	− 0 39.2
4	239 24.7	10 59.4	32 48.1	219 34.1	4 18.6	209 48.1	− 0 40.5
6	269 25.0	10 57.7	62 53.1	249 33.4	4 16.0	239 50.2	− 0 41.8
8	299 25.4	10 56.0	92 58.0	279 32.7	4 13.5	269 52.2	− 0 43.1
10	329 25.7	10 54.3	123 2.9	309 32.0	4 11.0	299 54.2	− 0 44.4
12	359 26.1	10 52.5	153 7.9	339 31.4	4 8.5	329 56.2	− 0 45.7
14	29 26.4	10 50.8	183 12.8	9 30.7	4 5.9	359 58.2	− 0 47.1
16	59 26.7	10 49.1	213 17.7	39 30.0	4 3.4	30 .2	− 0 48.4
18	89 27.1	10 47.4	243 22.6	69 29.3	4 .9	60 2.2	− 0 49.7
20	119 27.4	10 45.7	273 27.6	99 28.7	3 58.4	90 4.2	− 0 51.0
22	149 27.8	10 43.9	303 32.5	129 28.0	3 55.8	120 6.2	− 0 52.3
Δ	2	−9		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	274 37.4	49	25 26.9	66	48 35.9	−23 5.7	169 58.9	9 9.7
2	303 25.2	48	25 40.1	63	78 41.1	−23 5.8	200 3.3	9 9.5
4	332 12.8	46	25 52.6	59	108 46.3	−23 5.8	230 7.6	9 9.2
6	1 .1	45	26 4.5	56	138 51.4	−23 5.8	260 11.9	9 9.0
8	29 47.0	43	26 15.7	52	168 56.6	−23 5.9	290 16.3	9 8.8
10	58 33.7	42	26 26.2	49	199 1.8	−23 5.9	320 20.6	9 8.5
12	87 20.1	41	26 36.0	45	229 7.0	−23 5.9	350 25.0	9 8.3
14	116 6.3	40	26 45.0	42	259 12.2	−23 5.9	20 29.3	9 8.1
16	144 52.2	38	26 53.4	38	289 17.3	−23 6.0	50 33.7	9 7.8
18	173 37.9	37	27 1.0	34	319 22.5	−23 6.0	80 38.0	9 7.6
20	202 23.3	36	27 7.8	31	349 27.7	−23 6.0	110 42.3	9 7.4
22	231 8.6	36	27 14.0	27	19 32.9	−23 6.1	140 46.7	9 7.1
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 37	19 26	0 47	3 28	20 24	2.4	16 25	3.1
55	4 52	19 11	0 40	2 31	21 27	2.5	15 22	2.9
50	5 3	19 0	0 34	2 5	22 6	2.6	14 44	2.9
45	5 13	18 51	0 31	1 49	22 34	2.6	14 16	2.8
40	5 20	18 43	0 28	1 38	22 56	2.6	13 54	2.8
35	5 27	18 37	0 26	1 30	23 15	2.6	13 36	2.8
30	5 33	18 31	0 25	1 24	23 31	2.6	13 21	2.7
20	5 43	18 22	0 23	1 16	23 58	2.6	12 54	2.7
10	5 51	18 13	0 21	1 12	. . .	.0	12 32	2.6
0	5 59	18 6	0 21	1 10	. . .	.0	12 10	2.6
10	6 7	17 58	0 21	1 11	0 2	2.6	11 49	2.6
20	6 15	17 50	0 22	1 14	0 23	2.7	11 27	2.5
30	6 24	17 41	0 24	1 20	0 48	2.8	11 0	2.5
35	6 29	17 36	0 26	1 25	1 3	2.9	10 45	2.4
40	6 35	17 30	0 28	1 30	1 21	2.9	10 27	2.4
45	6 42	17 23	0 30	1 38	1 41	3.0	10 6	2.3
50	6 50	17 15	0 33	1 48	2 8	3.1	9 38	2.2
55	7 0	17 5	0 37	2 1	2 44	3.3	9 2	2.0
60	7 13	16 52	0 43	2 20	3 41	3.9	8 4	1.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 23.7	.7	15.8	$T_{\overline{m}}$	5 56	2.6	59.2	16.1
12	− 2 15.5	$T_{\overline{m}_\odot}$ 12 h	2.3 min	Starost 22.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 22	.1	187	−3.8	♃	20 42	.0	76	−2.4
♂	14 0	.1	177	1.7	♄	12 38	.0	197	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 28.1	10 42.2	333 37.4	159 27.3	3 53.3	150 8.3	− 0 53.7
2	209 28.5	10 40.5	3 42.3	189 26.6	3 50.8	180 10.3	− 0 55.0
4	239 28.8	10 38.7	33 47.3	219 26.0	3 48.2	210 12.3	− 0 56.3
6	269 29.2	10 37.0	63 52.2	249 25.3	3 45.7	240 14.3	− 0 57.6
8	299 29.5	10 35.3	93 57.1	279 24.6	3 43.2	270 16.3	− 0 58.9
10	329 29.9	10 33.6	124 2.1	309 23.9	3 40.6	300 18.3	− 1 .2
12	359 30.2	10 31.8	154 7.0	339 23.3	3 38.1	330 20.3	− 1 1.6
14	29 30.5	10 30.1	184 11.9	9 22.6	3 35.6	0 22.3	− 1 2.9
16	59 30.9	10 28.4	214 16.8	39 21.9	3 33.0	30 24.3	− 1 4.2
18	89 31.2	10 26.6	244 21.8	69 21.3	3 30.5	60 26.3	− 1 5.5
20	119 31.6	10 24.9	274 26.7	99 20.6	3 27.9	90 28.3	− 1 6.8
22	149 32.0	10 23.1	304 31.6	129 19.9	3 25.4	120 30.3	− 1 8.2
Δ	2	−9		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	259 53.8	35	27 19.3	23	49 38.0	−23 6.1	170 51.0	9 6.9
2	288 38.7	34	27 23.9	19	79 43.2	−23 6.1	200 55.4	9 6.7
4	317 23.6	34	27 27.8	16	109 48.4	−23 6.1	230 59.7	9 6.4
6	346 8.3	33	27 30.9	12	139 53.5	−23 6.2	261 4.0	9 6.2
8	14 52.9	33	27 33.2	8	169 58.7	−23 6.2	291 8.4	9 6.0
10	43 37.5	32	27 34.8	4	200 3.9	−23 6.2	321 12.7	9 5.7
12	72 22.0	32	27 35.6	0	230 9.0	−23 6.3	351 17.1	9 5.5
14	101 6.4	32	27 35.6	−4	260 14.2	−23 6.3	21 21.4	9 5.2
16	129 50.9	32	27 34.9	−8	290 19.4	−23 6.3	51 25.7	9 5.0
18	158 35.3	32	27 33.3	−11	320 24.5	−23 6.3	81 30.1	9 4.8
20	187 19.8	33	27 31.0	−15	350 29.7	−23 6.4	111 34.4	9 4.5
22	216 4.3	33	27 28.0	−19	20 34.8	−23 6.4	141 38.8	9 4.3
Δ					26	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 39	19 23	0 47	3 22	21 20	3.9	17 40	1.6
55	4 54	19 9	0 39	2 29	22 27	3.4	16 33	2.0
50	5 5	18 58	0 34	2 4	23 7	3.2	15 53	2.2
45	5 14	18 49	0 31	1 48	23 36	3.0	15 24	2.3
40	5 21	18 42	0 28	1 37	23 59	3.0	15 1	2.4
35	5 28	18 36	0 26	1 29	. . .	.0	14 42	2.4
30	5 33	18 30	0 25	1 23	. . .	.0	14 26	2.5
20	5 43	18 21	0 23	1 16	. . .	.0	13 59	2.5
10	5 51	18 13	0 21	1 11	0 21	2.6	13 35	2.6
0	5 59	18 5	0 21	1 10	0 43	2.6	13 13	2.6
10	6 6	17 58	0 21	1 11	1 5	2.6	12 51	2.7
20	6 14	17 50	0 22	1 14	1 28	2.6	12 27	2.7
30	6 23	17 41	0 24	1 20	1 56	2.6	11 59	2.7
35	6 28	17 36	0 26	1 25	2 12	2.6	11 43	2.8
40	6 34	17 31	0 27	1 30	2 31	2.6	11 24	2.8
45	6 40	17 24	0 30	1 38	2 54	2.6	11 1	2.8
50	6 48	17 16	0 33	1 48	3 23	2.5	10 31	2.9
55	6 58	17 7	0 37	2 1	4 4	2.5	9 50	3.0
60	7 11	16 54	0 43	2 20	5 14	2.3	8 40	3.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	− 2 7.3	.7	15.8	$T_{\overline{m}}$	6 58	2.6	59.4	16.2
12	− 1 59.0	$T_{\overline{m}_\odot}$ 12 h	2.0 min	Starost 23.6 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 22	.1	186	−3.8	♃	20 38	.0	76	−2.4
♂	13 59	.1	177	1.7	♄	12 35	.0	197	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 32.3	10 21.4	334 36.6	159 19.3	3 22.9	150 32.3	− 1 9.5
2	209 32.7	10 19.7	4 41.5	189 18.6	3 20.3	180 34.3	− 1 10.8
4	239 33.0	10 17.9	34 46.4	219 17.9	3 17.8	210 36.3	− 1 12.1
6	269 33.4	10 16.2	64 51.3	249 17.3	3 15.2	240 38.3	− 1 13.4
8	299 33.7	10 14.4	94 56.3	279 16.6	3 12.7	270 40.3	− 1 14.8
10	329 34.1	10 12.7	125 1.2	309 15.9	3 10.1	300 42.4	− 1 16.1
12	359 34.4	10 10.9	155 6.1	339 15.3	3 7.6	330 44.4	− 1 17.4
14	29 34.8	10 9.2	185 11.1	9 14.6	3 5.1	0 46.4	− 1 18.7
16	59 35.1	10 7.4	215 16.0	39 14.0	3 2.5	30 48.4	− 1 20.0
18	89 35.5	10 5.7	245 20.9	69 13.3	2 60.0	60 50.4	− 1 21.4
20	119 35.9	10 3.9	275 25.8	99 12.6	2 57.4	90 52.4	− 1 22.7
22	149 36.2	10 2.2	305 30.8	129 12.0	2 54.9	120 54.4	− 1 24.0
Δ	2	−9		−3	−13	10	−7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	244 49.0	33	27 24.1	−23	50 40.0	−23 6.4	171 43.1	9 4.1
2	273 33.6	34	27 19.5	−27	80 45.1	−23 6.4	201 47.5	9 3.8
4	302 18.4	35	27 14.1	−31	110 50.3	−23 6.5	231 51.8	9 3.6
6	331 3.4	35	27 8.0	−34	140 55.4	−23 6.5	261 56.1	9 3.4
8	359 48.4	36	27 1.1	−38	171 .6	−23 6.5	292 .5	9 3.1
10	28 33.7	37	26 53.5	−42	201 5.7	−23 6.6	322 4.8	9 2.9
12	57 19.1	38	26 45.1	−46	231 10.9	−23 6.6	352 9.2	9 2.7
14	86 4.7	39	26 36.0	−49	261 16.0	−23 6.6	22 13.5	9 2.4
16	114 50.6	40	26 26.2	−53	291 21.2	−23 6.6	52 17.8	9 2.2
18	143 36.7	42	26 15.6	−56	321 26.3	−23 6.7	82 22.2	9 2.0
20	172 23.0	43	26 4.3	−60	351 31.4	−23 6.7	112 26.5	9 1.7
22	201 9.6	44	25 52.3	−63	21 36.6	−23 6.7	142 30.8	9 1.5
Δ					26	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 41	19 20	0 46	3 17	22 52	4.5	18 18	.7
55	4 56	19 7	0 39	2 28	23 48	3.8	17 22	1.3
50	5 6	18 56	0 34	2 3	. . . .	.0	16 46	1.6
45	5 15	18 47	0 31	1 48	. . . .	.0	16 19	1.8
40	5 22	18 40	0 28	1 37	. . . .	.0	15 58	1.9
35	5 28	18 34	0 26	1 29	0 17	2.9	15 41	2.0
30	5 34	18 29	0 25	1 23	0 33	2.8	15 25	2.1
20	5 43	18 20	0 22	1 15	1 1	2.7	14 59	2.3
10	5 51	18 12	0 21	1 11	1 24	2.7	14 37	2.4
0	5 58	18 5	0 21	1 10	1 46	2.6	14 16	2.5
10	6 6	17 58	0 21	1 11	2 8	2.5	13 54	2.6
20	6 13	17 50	0 22	1 14	2 31	2.4	13 32	2.7
30	6 22	17 42	0 24	1 20	2 58	2.3	13 5	2.9
35	6 27	17 37	0 26	1 24	3 14	2.2	12 49	3.0
40	6 32	17 32	0 27	1 30	3 33	2.2	12 31	3.1
45	6 39	17 25	0 30	1 38	3 56	2.0	12 9	3.2
50	6 46	17 18	0 33	1 48	4 24	1.9	11 41	3.4
55	6 56	17 9	0 37	2 1	5 4	1.6	11 2	3.7
60	7 8	16 57	0 43	2 19	6 9	1.0	9 57	4.4
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 1 50.6	.7	15.9	$T_{\overline{m}}$ 8 1	2.5	59.5	16.2
12	− 1 42.0	$T_{\overline{m}_\odot}$ 12 h 1.7 min		Starost 24.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 23	.1	185	−3.8	♄	20 34	.0	76	−2.4
♂	13 57	.1	176	1.7	♃	12 31	.0	197	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 36.6	10 .4	335 35.7	159 11.3	2 52.3	150 56.4	− 1 25.3
2	209 36.9	9 58.7	5 40.6	189 10.7	2 49.8	180 58.4	− 1 26.6
4	239 37.3	9 56.9	35 45.6	219 10.0	2 47.2	211 .4	− 1 28.0
6	269 37.7	9 55.2	65 50.5	249 9.3	2 44.7	241 2.4	− 1 29.3
8	299 38.0	9 53.4	95 55.4	279 8.7	2 42.1	271 4.4	− 1 30.6
10	329 38.4	9 51.6	126 .3	309 8.0	2 39.6	301 6.4	− 1 31.9
12	359 38.8	9 49.9	156 5.3	339 7.4	2 37.0	331 8.4	− 1 33.2
14	29 39.1	9 48.1	186 10.2	9 6.7	2 34.5	1 10.3	− 1 34.6
16	59 39.5	9 46.3	216 15.1	39 6.1	2 31.9	31 12.3	− 1 35.9
18	89 39.9	9 44.6	246 20.1	69 5.4	2 29.4	61 14.3	− 1 37.2
20	119 40.2	9 42.8	276 25.0	99 4.7	2 26.8	91 16.3	− 1 38.5
22	149 40.6	9 41.1	306 29.9	129 4.1	2 24.2	121 18.3	− 1 39.8
Δ	2	−9		−3	−13	10	−7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_\jupiter$	JUPITER $\delta_\jupiter$	SATURN $S_\saturn$	SATURN $\delta_\saturn$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	229 56.5	46	25 39.6	−67	51 41.7	−23 6.7	172 35.2	9 1.2
2	258 43.7	47	25 26.3	−70	81 46.9	−23 6.8	202 39.5	9 1.0
4	287 31.2	49	25 12.2	−74	111 52.0	−23 6.8	232 43.9	9 .8
6	316 19.0	51	24 57.5	−77	141 57.1	−23 6.8	262 48.2	9 .5
8	345 7.1	52	24 42.1	−80	172 2.3	−23 6.8	292 52.5	9 .3
10	13 55.6	54	24 26.1	−83	202 7.4	−23 6.9	322 56.9	9 .1
12	42 44.4	56	24 9.5	−86	232 12.5	−23 6.9	353 1.2	8 59.8
14	71 33.6	58	23 52.2	−89	262 17.6	−23 6.9	23 5.6	8 59.6
16	100 23.2	60	23 34.4	−92	292 22.8	−23 6.9	53 9.9	8 59.4
18	129 13.1	62	23 15.9	−95	322 27.9	−23 7.0	83 14.2	8 59.1
20	158 3.4	64	22 56.8	−98	352 33.0	−23 7.0	113 18.6	8 58.9
22	186 54.2	66	22 37.2	−101	22 38.1	−23 7.0	143 22.9	8 58.6
Δ					26	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 44	19 18	0 46	3 13	. . . .	.0	18 33	.3
55	4 57	19 4	0 39	2 26	. . . .	.0	17 53	.8
50	5 8	18 54	0 34	2 2	0 23	3.5	17 24	1.2
45	5 16	18 46	0 31	1 47	0 49	3.3	17 2	1.4
40	5 23	18 39	0 28	1 37	1 10	3.1	16 45	1.6
35	5 29	18 33	0 26	1 29	1 27	3.0	16 30	1.7
30	5 34	18 28	0 25	1 23	1 41	2.9	16 17	1.8
20	5 43	18 19	0 22	1 15	2 6	2.7	15 54	2.0
10	5 51	18 12	0 21	1 11	2 28	2.6	15 34	2.2
0	5 58	18 5	0 21	1 10	2 48	2.4	15 16	2.4
10	6 5	17 58	0 21	1 10	3 8	2.3	14 58	2.5
20	6 12	17 51	0 22	1 14	3 29	2.2	14 38	2.7
30	6 21	17 42	0 24	1 20	3 54	2.0	14 14	2.9
35	6 25	17 38	0 26	1 24	4 8	1.9	14 1	3.0
40	6 31	17 33	0 27	1 30	4 25	1.7	13 45	3.2
45	6 37	17 27	0 30	1 38	4 45	1.6	13 26	3.3
50	6 44	17 19	0 33	1 48	5 10	1.3	13 2	3.6
55	6 53	17 11	0 37	2 1	5 43	1.0	12 30	3.9
60	7 5	16 59	0 43	2 19	6 33	.4	11 42	4.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	− 1 33.5	.7	15.9	$T_{\overline{m}}$ 9 2	2.4	59.4	16.2
12	− 1 24.7	$T_{\overline{m}_\odot}$ 12 h 1.4 min		Starost 25.6 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 24	.1	184	−3.8	♄	20 30	.0	76	−2.4
♂	13 55	.1	175	1.7	♃	12 28	.0	197	1.0

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UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 41.0	9 39.3	336 34.8	159 3.4	2 21.7	151 20.3	- 1 41.2
2	209 41.3	9 37.5	6 39.8	189 2.8	2 19.1	181 22.3	- 1 42.5
4	239 41.7	9 35.7	36 44.7	219 2.1	2 16.6	211 24.3	- 1 43.8
6	269 42.1	9 34.0	66 49.6	249 1.5	2 14.0	241 26.3	- 1 45.1
8	299 42.4	9 32.2	96 54.5	279 .8	2 11.5	271 28.3	- 1 46.4
10	329 42.8	9 30.4	126 59.5	309 .2	2 8.9	301 30.3	- 1 47.8
12	359 43.2	9 28.7	157 4.4	338 59.5	2 6.3	331 32.3	- 1 49.1
14	29 43.5	9 26.9	187 9.3	8 58.9	2 3.8	1 34.3	- 1 50.4
16	59 43.9	9 25.1	217 14.3	38 58.2	2 1.2	31 36.3	- 1 51.7
18	89 44.3	9 23.3	247 19.2	68 57.6	1 58.7	61 38.3	- 1 53.0
20	119 44.7	9 21.6	277 24.1	98 56.9	1 56.1	91 40.3	- 1 54.4
22	149 45.0	9 19.8	307 29.0	128 56.3	1 53.5	121 42.2	- 1 55.7
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	215 45.3	68	22 17.1	-104	52 43.3	-23 7.0	173 27.3	8 58.4
2	244 36.8	70	21 56.3	-106	82 48.4	-23 7.1	203 31.6	8 58.2
4	273 28.7	72	21 35.1	-109	112 53.5	-23 7.1	233 35.9	8 57.9
6	302 21.0	74	21 13.4	-111	142 58.6	-23 7.1	263 40.3	8 57.7
8	331 13.7	76	20 51.1	-114	173 3.7	-23 7.1	293 44.6	8 57.5
10	0 6.9	78	20 28.4	-116	203 8.9	-23 7.2	323 49.0	8 57.2
12	29 .4	80	20 5.1	-118	233 14.0	-23 7.2	353 53.3	8 57.0
14	57 54.4	82	19 41.5	-121	263 19.1	-23 7.2	23 57.6	8 56.8
16	86 48.7	84	19 17.4	-123	293 24.2	-23 7.2	54 2.0	8 56.5
18	115 43.5	86	18 52.8	-125	323 29.3	-23 7.2	84 6.3	8 56.3
20	144 38.7	88	18 27.9	-127	353 34.4	-23 7.3	114 10.7	8 56.1
22	173 34.2	90	18 2.5	-129	23 39.5	-23 7.3	144 15.0	8 55.8
Δ					26	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 46	19 15	0 46	3 9	0 42	4.5	18 40	.1
55	4 59	19 2	0 39	2 25	1 20	3.9	18 13	.6
50	5 9	18 52	0 34	2 2	1 47	3.6	17 52	.9
45	5 17	18 44	0 31	1 47	2 8	3.3	17 36	1.1
40	5 24	18 37	0 28	1 36	2 25	3.1	17 22	1.3
35	5 30	18 32	0 26	1 29	2 39	3.0	17 10	1.4
30	5 35	18 27	0 24	1 23	2 51	2.8	17 0	1.6
20	5 44	18 18	0 22	1 15	3 12	2.6	16 43	1.8
10	5 51	18 11	0 21	1 11	3 30	2.4	16 27	2.0
0	5 58	18 4	0 21	1 10	3 46	2.3	16 13	2.2
10	6 5	17 58	0 21	1 10	4 3	2.1	15 58	2.4
20	6 12	17 51	0 22	1 14	4 21	1.9	15 42	2.6
30	6 20	17 43	0 24	1 20	4 41	1.7	15 24	2.8
35	6 24	17 39	0 26	1 24	4 53	1.6	15 13	2.9
40	6 29	17 34	0 27	1 30	5 6	1.4	15 1	3.1
45	6 35	17 28	0 30	1 38	5 22	1.2	14 46	3.3
50	6 42	17 21	0 33	1 48	5 42	1.0	14 28	3.5
55	6 51	17 12	0 37	2 1	6 7	.7	14 4	3.9
60	7 2	17 1	0 43	2 19	6 42	.2	13 31	4.4
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 16.0	.7	15.9	$T_{\overline{m}}$ 9 60	2.2	59.2	16.1
12	- 1 7.1	$T_{\overline{m}_\odot}$ 12 h	1.1 min	Starost 26.6 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 24	.1	182	-3.8	♃	20 26	.0	76	-2.4
♂	13 54	.1	175	1.7	♄	12 24	.0	197	1.0

29. AVGUST PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 45.4	9 18.0	337 34.0	158 55.6	1 51.0	151 44.2	- 1 57.0
2	209 45.8	9 16.2	7 38.9	188 55.0	1 48.4	181 46.2	- 1 58.3
4	239 46.2	9 14.4	37 43.8	218 54.3	1 45.9	211 48.2	- 1 59.7
6	269 46.5	9 12.7	67 48.8	248 53.7	1 43.3	241 50.2	- 2 1.0
8	299 46.9	9 10.9	97 53.7	278 53.0	1 40.7	271 52.2	- 2 2.3
10	329 47.3	9 9.1	127 58.6	308 52.4	1 38.2	301 54.2	- 2 3.6
12	359 47.7	9 7.3	158 3.5	338 51.8	1 35.6	331 56.2	- 2 4.9
14	29 48.0	9 5.5	188 8.5	8 51.1	1 33.0	1 58.2	- 2 6.3
16	59 48.4	9 3.7	218 13.4	38 50.5	1 30.5	32 .1	- 2 7.6
18	89 48.8	9 1.9	248 18.3	68 49.8	1 27.9	62 2.1	- 2 8.9
20	119 49.2	9 .1	278 23.3	98 49.2	1 25.3	92 4.1	- 2 10.2
22	149 49.6	8 58.4	308 28.2	128 48.5	1 22.8	122 6.1	- 2 11.5
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	202 30.2	92	17 36.8	-131	53 44.6	-23 7.3	174 19.3	8 55.6
2	231 26.6	94	17 10.7	-132	83 49.7	-23 7.3	204 23.7	8 55.3
4	260 23.3	96	16 44.2	-134	113 54.8	-23 7.4	234 28.0	8 55.1
6	289 20.5	98	16 17.4	-136	143 59.9	-23 7.4	264 32.3	8 54.9
8	318 18.0	100	15 50.3	-137	174 5.0	-23 7.4	294 36.7	8 54.6
10	347 15.9	101	15 22.8	-139	204 10.1	-23 7.4	324 41.0	8 54.4
12	16 14.2	103	14 55.1	-140	234 15.2	-23 7.4	354 45.4	8 54.2
14	45 12.9	105	14 27.1	-142	264 20.3	-23 7.5	24 49.7	8 53.9
16	74 11.9	107	13 58.8	-143	294 25.4	-23 7.5	54 54.0	8 53.7
18	103 11.3	109	13 30.2	-144	324 30.5	-23 7.5	84 58.4	8 53.5
20	132 11.0	110	13 1.4	-145	354 35.6	-23 7.5	115 2.7	8 53.2
22	161 11.1	112	12 32.4	-146	24 40.7	-23 7.6	145 7.1	8 53.0
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 48	19 12	0 45	3 5	2 29	4.2	18 44	.1
55	5 1	18 59	0 39	2 23	2 54	3.8	18 26	.4
50	5 11	18 50	0 34	2 1	3 13	3.5	18 13	.7
45	5 19	18 42	0 30	1 46	3 28	3.2	18 2	.9
40	5 25	18 36	0 28	1 36	3 40	3.0	17 53	1.1
35	5 31	18 30	0 26	1 28	3 50	2.9	17 45	1.3
30	5 35	18 26	0 24	1 23	3 59	2.7	17 38	1.4
20	5 44	18 18	0 22	1 15	4 15	2.5	17 26	1.6
10	5 51	18 11	0 21	1 11	4 28	2.3	17 15	1.8
0	5 58	18 4	0 21	1 10	4 40	2.1	17 5	2.0
10	6 4	17 58	0 21	1 10	4 53	1.9	16 55	2.2
20	6 11	17 51	0 22	1 14	5 6	1.7	16 43	2.4
30	6 18	17 44	0 24	1 20	5 21	1.5	16 31	2.7
35	6 23	17 39	0 26	1 24	5 30	1.3	16 23	2.8
40	6 28	17 35	0 27	1 30	5 40	1.2	16 15	3.0
45	6 33	17 29	0 30	1 38	5 51	1.0	16 5	3.2
50	6 40	17 22	0 33	1 48	6 5	.8	15 53	3.4
55	6 48	17 14	0 37	2 1	6 23	.5	15 37	3.7
60	6 59	17 4	0 42	2 19	6 46	.1	15 17	4.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 58.2	.8	15.9	$T_{\overline{m}}$ 10 53	2.0	58.9	16.1
12	- 0 49.1	$T_{\overline{m}_\odot}$ 12 h	.8 min	Starost 27.6 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 25	.1	181	-3.8	♃	20 22	.0	76	-2.4
♂	13 52	.1	174	1.7	♄	12 21	.0	197	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 50.0	8 56.6	338 33.1	158 47.9	1 20.2	152 8.1	- 2 12.9
2	209 50.3	8 54.8	8 38.0	188 47.2	1 17.6	182 10.1	- 2 14.2
4	239 50.7	8 53.0	38 43.0	218 46.6	1 15.1	212 12.0	- 2 15.5
6	269 51.1	8 51.2	68 47.9	248 45.9	1 12.5	242 14.0	- 2 16.8
8	299 51.5	8 49.4	98 52.8	278 45.3	1 9.9	272 16.0	- 2 18.2
10	329 51.9	8 47.6	128 57.8	308 44.7	1 7.4	302 18.0	- 2 19.5
12	359 52.3	8 45.8	159 2.7	338 44.0	1 4.8	332 20.0	- 2 20.8
14	29 52.6	8 44.0	189 7.6	8 43.4	1 2.2	2 22.0	- 2 22.1
16	59 53.0	8 42.2	219 12.5	38 42.7	0 59.7	32 23.9	- 2 23.4
18	89 53.4	8 40.4	249 17.5	68 42.1	0 57.1	62 25.9	- 2 24.8
20	119 53.8	8 38.6	279 22.4	98 41.5	0 54.5	92 27.9	- 2 26.1
22	149 54.2	8 36.8	309 27.3	128 40.8	0 51.9	122 29.9	- 2 27.4
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	190 11.4	114	12 3.1	-147	54 45.8	-23 7.6	175 11.4	8 52.7
2	219 12.2	115	11 33.6	-148	84 50.8	-23 7.6	205 15.7	8 52.5
4	248 13.2	117	11 4.0	-149	114 55.9	-23 7.6	235 20.1	8 52.3
6	277 14.5	118	10 34.2	-150	145 1.0	-23 7.6	265 24.4	8 52.0
8	306 16.2	120	10 4.2	-151	175 6.1	-23 7.7	295 28.7	8 51.8
10	335 18.1	121	9 34.0	-151	205 11.2	-23 7.7	325 33.1	8 51.6
12	4 20.4	123	9 3.7	-152	235 16.2	-23 7.7	355 37.4	8 51.3
14	33 22.9	124	8 33.3	-153	265 21.3	-23 7.7	25 41.8	8 51.1
16	62 25.6	125	8 2.8	-153	295 26.4	-23 7.7	55 46.1	8 50.9
18	91 28.7	126	7 32.2	-154	325 31.5	-23 7.8	85 50.4	8 50.6
20	120 31.9	128	7 1.5	-154	355 36.5	-23 7.8	115 54.8	8 50.4
22	149 35.5	129	6 30.7	-154	25 41.6	-23 7.8	145 59.1	8 50.1
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 51	19 9	0 45	3 2	4 10	4.0	18 46	.0
55	5 3	18 57	0 38	2 22	4 25	3.6	18 37	.4
50	5 12	18 48	0 34	2 0	4 36	3.3	18 30	.6
45	5 20	18 40	0 30	1 46	4 45	3.1	18 24	.8
40	5 26	18 34	0 28	1 36	4 53	2.9	18 19	1.0
35	5 31	18 29	0 26	1 28	4 59	2.7	18 15	1.1
30	5 36	18 25	0 24	1 23	5 5	2.6	18 11	1.3
20	5 44	18 17	0 22	1 15	5 14	2.4	18 5	1.5
10	5 51	18 10	0 21	1 11	5 23	2.2	17 59	1.7
0	5 57	18 4	0 21	1 9	5 31	2.0	17 53	1.9
10	6 3	17 58	0 21	1 10	5 39	1.8	17 48	2.1
20	6 10	17 51	0 22	1 14	5 47	1.6	17 42	2.3
30	6 17	17 44	0 24	1 20	5 56	1.3	17 35	2.6
35	6 21	17 40	0 26	1 24	6 2	1.2	17 31	2.7
40	6 26	17 35	0 27	1 30	6 8	1.0	17 26	2.9
45	6 32	17 30	0 30	1 38	6 15	.9	17 21	3.0
50	6 38	17 24	0 33	1 48	6 24	.6	17 14	3.3
55	6 46	17 16	0 37	2 1	6 34	.4	17 6	3.5
60	6 56	17 6	0 42	2 19	6 48	.0	16 56	3.9
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 0 40.0	.8	15.9		11 42	1.9	58.5	15.9
12	- 0 30.7	$T_{\overline{m}_\odot}$ 12 h	.5 min	Starost 28.6 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 25	.1	180	-3.8	♆	20 18	.0	76	-2.4
♂	13 51	.1	174	1.7	♄	12 17	.0	197	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 54.6	8 35.0	339 32.3	158 40.2	0 49.4	152 31.9	- 2 28.7
2	209 55.0	8 33.2	9 37.2	188 39.5	0 46.8	182 33.8	- 2 30.0
4	239 55.4	8 31.4	39 42.1	218 38.9	0 44.2	212 35.8	- 2 31.4
6	269 55.7	8 29.6	69 47.0	248 38.3	0 41.7	242 37.8	- 2 32.7
8	299 56.1	8 27.8	99 52.0	278 37.6	0 39.1	272 39.8	- 2 34.0
10	329 56.5	8 25.9	129 56.9	308 37.0	0 36.5	302 41.8	- 2 35.3
12	359 56.9	8 24.1	160 1.8	338 36.3	0 33.9	332 43.7	- 2 36.7
14	29 57.3	8 22.3	190 6.8	8 35.7	0 31.4	2 45.7	- 2 38.0
16	59 57.7	8 20.5	220 11.7	38 35.1	0 28.8	32 47.7	- 2 39.3
18	89 58.1	8 18.7	250 16.6	68 34.4	0 26.2	62 49.7	- 2 40.6
20	119 58.5	8 16.9	280 21.5	98 33.8	0 23.7	92 51.6	- 2 41.9
22	149 58.9	8 15.1	310 26.5	128 33.1	0 21.1	122 53.6	- 2 43.3
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	178 39.2	130	5 59.8	-155	55 46.7	-23 7.8	176 3.4	8 49.9
2	207 43.2	131	5 28.9	-155	85 51.8	-23 7.8	206 7.8	8 49.7
4	236 47.4	132	4 57.9	-155	115 56.8	-23 7.8	236 12.1	8 49.4
6	265 51.8	133	4 26.9	-155	146 1.9	-23 7.9	266 16.5	8 49.2
8	294 56.4	134	3 55.9	-155	176 7.0	-23 7.9	296 20.8	8 49.0
10	324 1.2	135	3 24.8	-155	206 12.0	-23 7.9	326 25.1	8 48.7
12	353 6.1	136	2 53.8	-155	236 17.1	-23 7.9	356 29.5	8 48.5
14	22 11.3	136	2 22.7	-155	266 22.1	-23 7.9	26 33.8	8 48.3
16	51 16.6	137	1 51.7	-155	296 27.2	-23 8.0	56 38.1	8 48.0
18	80 22.0	138	1 20.7	-155	326 32.3	-23 8.0	86 42.5	8 47.8
20	109 27.6	139	0 49.8	-155	356 37.3	-23 8.0	116 46.8	8 47.5
22	138 33.4	139	0 18.9	-154	26 42.4	-23 8.0	146 51.2	8 47.3
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 53	19 6	0 45	2 59	5 46	3.8	18 46	.0
55	5 5	18 54	0 38	2 21	5 52	3.5	18 45	.3
50	5 14	18 46	0 34	1 59	5 56	3.2	18 44	.6
45	5 21	18 39	0 30	1 45	5 60	3.0	18 44	.8
40	5 27	18 33	0 28	1 35	6 2	2.8	18 43	1.0
35	5 32	18 28	0 26	1 28	6 5	2.6	18 42	1.1
30	5 37	18 23	0 24	1 22	6 7	2.5	18 42	1.2
20	5 44	18 16	0 22	1 15	6 11	2.3	18 41	1.5
10	5 51	18 9	0 21	1 11	6 14	2.1	18 40	1.7
0	5 57	18 3	0 21	1 9	6 18	1.9	18 39	1.8
10	6 3	17 58	0 21	1 10	6 21	1.7	18 38	2.0
20	6 9	17 52	0 22	1 13	6 24	1.5	18 37	2.2
30	6 16	17 45	0 24	1 20	6 28	1.2	18 36	2.5
35	6 20	17 41	0 25	1 24	6 30	1.1	18 36	2.6
40	6 25	17 36	0 27	1 30	6 33	1.0	18 35	2.8
45	6 30	17 31	0 30	1 38	6 36	.8	18 34	3.0
50	6 36	17 25	0 33	1 48	6 39	.6	18 33	3.2
55	6 43	17 18	0 37	2 1	6 43	.3	18 31	3.4
60	6 53	17 8	0 42	2 19	6 49	.0	18 30	3.8
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	- 0 21.5	.8	15.9		12 28	1.9	57.9	15.8
12	- 0 12.1	$T_{\overline{m}_\odot}$ 12 h	.2 min	Starost .2 d		Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 26	.1	179	-3.8	♆	20 13	.0	76	-2.4
♂	13 49	.1	173	1.7	♄	12 14	.0	197	1.0

1. SEPTEMBAR 2008. PONEDELJAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 59.3	8 13.3	340 31.4	158 32.5	0 18.5	152 55.6	- 2 44.6
2	209 59.7	8 11.4	10 36.3	188 31.9	0 15.9	182 57.6	- 2 45.9
4	240 .1	8 9.6	40 41.2	218 31.2	0 13.4	212 59.5	- 2 47.2
6	270 .5	8 7.8	70 46.2	248 30.6	0 10.8	243 1.5	- 2 48.5
8	300 .9	8 6.0	100 51.1	278 29.9	0 8.2	273 3.5	- 2 49.9
10	330 1.3	8 4.2	130 56.0	308 29.3	0 5.6	303 5.4	- 2 51.2
12	0 1.7	8 2.4	161 1.0	338 28.7	0 3.1	333 7.4	- 2 52.5
14	30 2.1	8 .5	191 5.9	8 28.0	0 .5	3 9.4	- 2 53.8
16	60 2.5	7 58.7	221 10.8	38 27.4	- 0 2.1	33 11.4	- 2 55.2
18	90 2.9	7 56.9	251 15.7	68 26.8	- 0 4.7	63 13.3	- 2 56.5
20	120 3.3	7 55.1	281 20.7	98 26.1	- 0 7.2	93 15.3	- 2 57.8
22	150 3.7	7 53.2	311 25.6	128 25.5	- 0 9.8	123 17.3	- 2 59.1
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	167 39.2	140	- 0 12.0	-154	56 47.4	-23 8.0	176 55.5	8 47.1
2	196 45.2	140	- 0 42.8	-154	86 52.5	-23 8.0	206 59.8	8 46.8
4	225 51.2	141	- 1 13.5	-153	116 57.5	-23 8.1	237 4.2	8 46.6
6	254 57.4	141	- 1 44.1	-153	147 2.6	-23 8.1	267 8.5	8 46.4
8	284 3.7	142	- 2 14.6	-152	177 7.6	-23 8.1	297 12.8	8 46.1
10	313 10.0	142	- 2 45.0	-152	207 12.7	-23 8.1	327 17.2	8 45.9
12	342 16.5	142	- 3 15.4	-151	237 17.7	-23 8.1	357 21.5	8 45.7
14	11 22.9	143	- 3 45.5	-150	267 22.7	-23 8.1	27 25.9	8 45.4
16	40 29.5	143	- 4 15.6	-150	297 27.8	-23 8.2	57 30.2	8 45.2
18	69 36.1	143	- 4 45.5	-149	327 32.8	-23 8.2	87 34.5	8 44.9
20	98 42.7	143	- 5 15.3	-148	357 37.9	-23 8.2	117 38.9	8 44.7
22	127 49.4	143	- 5 44.9	-147	27 42.9	-23 8.2	147 43.2	8 44.5
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 56	19 3	0 45	2 56	7 18	3.7	18 47	.0
55	5 7	18 52	0 38	2 20	7 15	3.4	18 53	.4
50	5 15	18 43	0 34	1 59	7 13	3.1	18 58	.6
45	5 22	18 37	0 30	1 45	7 11	2.9	19 2	.8
40	5 28	18 31	0 28	1 35	7 10	2.7	19 6	1.0
35	5 33	18 26	0 26	1 28	7 9	2.6	19 9	1.1
30	5 37	18 22	0 24	1 22	7 7	2.5	19 11	1.2
20	5 44	18 15	0 22	1 15	7 6	2.2	19 16	1.5
10	5 51	18 9	0 21	1 11	7 4	2.0	19 20	1.7
0	5 57	18 3	0 21	1 9	7 3	1.8	19 24	1.8
10	6 2	17 58	0 21	1 10	7 1	1.6	19 27	2.0
20	6 8	17 52	0 22	1 13	6 60	1.4	19 31	2.2
30	6 15	17 45	0 24	1 20	6 58	1.2	19 36	2.4
35	6 19	17 41	0 25	1 24	6 57	1.1	19 38	2.6
40	6 23	17 37	0 27	1 30	6 56	1.0	19 41	2.7
45	6 28	17 32	0 30	1 38	6 55	.8	19 45	2.9
50	6 34	17 27	0 33	1 48	6 53	.6	19 49	3.1
55	6 41	17 20	0 37	2 1	6 52	.3	19 54	3.4
60	6 50	17 11	0 42	2 19	6 49	.0	20 0	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 0 2.7	.8	15.9	$T_{\overline{m}}$ 13 13	1.8	57.3	15.6
12	0 6.9	$T_{\overline{m}_\odot}$ 11 h 59.9 min		Starost 1.2 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 26	.1	178	-3.8	♃	20 9	.0	76	-2.4
♂	13 47	.1	172	1.7	♄	12 11	.0	196	1.0

2. SEPTEMBAR UTORAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 4.1	7 51.4	341 30.5	158 24.9	- 0 12.4	153 19.2	- 3 .4
2	210 4.5	7 49.6	11 35.5	188 24.2	- 0 15.0	183 21.2	- 3 1.8
4	240 4.9	7 47.8	41 40.4	218 23.6	- 0 17.5	213 23.2	- 3 3.1
6	270 5.3	7 45.9	71 45.3	248 22.9	- 0 20.1	243 25.1	- 3 4.4
8	300 5.7	7 44.1	101 50.2	278 22.3	- 0 22.7	273 27.1	- 3 5.7
10	330 6.1	7 42.3	131 55.2	308 21.7	- 0 25.3	303 29.1	- 3 7.0
12	0 6.5	7 40.4	162 .1	338 21.0	- 0 27.9	333 31.0	- 3 8.4
14	30 6.9	7 38.6	192 5.0	8 20.4	- 0 30.4	3 33.0	- 3 9.7
16	60 7.3	7 36.8	222 10.0	38 19.8	- 0 33.0	33 35.0	- 3 11.0
18	90 7.7	7 34.9	252 14.9	68 19.1	- 0 35.6	63 36.9	- 3 12.3
20	120 8.1	7 33.1	282 19.8	98 18.5	- 0 38.2	93 38.9	- 3 13.7
22	150 8.5	7 31.3	312 24.7	128 17.9	- 0 40.7	123 40.9	- 3 15.0
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	156 56.0	143	- 6 14.4	-146	57 47.9	-23 8.2	177 47.5	8 44.2
2	186 2.7	144	- 6 43.7	-146	87 53.0	-23 8.2	207 51.9	8 44.0
4	215 9.4	144	- 7 12.8	-145	117 58.0	-23 8.3	237 56.2	8 43.8
6	244 16.1	143	- 7 41.7	-144	148 3.0	-23 8.3	268 .6	8 43.5
8	273 22.8	143	- 8 10.4	-143	178 8.1	-23 8.3	298 4.9	8 43.3
10	302 29.5	143	- 8 39.0	-142	208 13.1	-23 8.3	328 9.2	8 43.0
12	331 36.2	143	- 9 7.3	-141	238 18.1	-23 8.3	358 13.6	8 42.8
14	0 42.8	143	- 9 35.4	-139	268 23.2	-23 8.3	28 17.9	8 42.6
16	29 49.4	143	-10 3.3	-138	298 28.2	-23 8.3	58 22.2	8 42.3
18	58 56.0	142	-10 31.0	-137	328 33.2	-23 8.4	88 26.6	8 42.1
20	88 2.5	142	-10 58.4	-136	358 38.2	-23 8.4	118 30.9	8 41.9
22	117 8.9	142	-11 25.6	-135	28 43.2	-23 8.4	148 35.3	8 41.6
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	4 58	18 60	0 44	2 54	8 48	3.7	18 48	.1
55	5 9	18 49	0 38	2 19	8 37	3.4	19 2	.4
50	5 17	18 41	0 33	1 58	8 28	3.1	19 13	.7
45	5 23	18 35	0 30	1 45	8 21	2.9	19 22	.9
40	5 29	18 30	0 28	1 35	8 16	2.7	19 29	1.0
35	5 34	18 25	0 26	1 27	8 11	2.6	19 36	1.2
30	5 38	18 21	0 24	1 22	8 6	2.4	19 41	1.3
20	5 45	18 14	0 22	1 15	7 59	2.2	19 51	1.5
10	5 51	18 8	0 21	1 11	7 53	2.0	19 59	1.7
0	5 56	18 3	0 21	1 9	7 47	1.8	20 8	1.9
10	6 2	17 58	0 21	1 10	7 41	1.7	20 16	2.0
20	6 7	17 52	0 22	1 13	7 34	1.5	20 24	2.2
30	6 14	17 46	0 24	1 20	7 27	1.3	20 34	2.4
35	6 17	17 42	0 25	1 24	7 23	1.1	20 40	2.5
40	6 21	17 38	0 27	1 30	7 19	1.0	20 47	2.7
45	6 26	17 34	0 30	1 38	7 14	.8	20 54	2.9
50	6 32	17 28	0 33	1 48	7 7	.6	21 3	3.1
55	6 39	17 22	0 36	2 1	6 60	.4	21 15	3.4
60	6 47	17 13	0 42	2 19	6 50	.0	21 30	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	0 16.4	.8	15.9	$T_{\overline{m}}$ 13 57	1.8	56.6	15.4
12	0 26.2	$T_{\overline{m}_\odot}$ 11 h 59.6 min		Starost 2.2 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 27	.1	177	-3.8	♃	20 5	.0	76	-2.4
♂	13 46	.1	172	1.7	♄	12 7	.0	196	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 8.9	7 29.4	342 29.7	158 17.2	− 0 43.3	153 42.8	− 3 16.3
2	210 9.3	7 27.6	12 34.6	188 16.6	− 0 45.9	183 44.8	− 3 17.6
4	240 9.7	7 25.8	42 39.5	218 16.0	− 0 48.5	213 46.8	− 3 18.9
6	270 10.1	7 23.9	72 44.5	248 15.3	− 0 51.0	243 48.7	− 3 20.3
8	300 10.5	7 22.1	102 49.4	278 14.7	− 0 53.6	273 50.7	− 3 21.6
10	330 11.0	7 20.2	132 54.3	308 14.0	− 0 56.2	303 52.6	− 3 22.9
12	0 11.4	7 18.4	162 59.2	338 13.4	− 0 58.8	333 54.6	− 3 24.2
14	30 11.8	7 16.6	193 4.2	8 12.8	− 1 1.4	3 56.6	− 3 25.5
16	60 12.2	7 14.7	223 9.1	38 12.1	− 1 3.9	33 58.5	− 3 26.9
18	90 12.6	7 12.9	253 14.0	68 11.5	− 1 6.5	64 .5	− 3 28.2
20	120 13.0	7 11.0	283 19.0	98 10.9	− 1 9.1	94 2.4	− 3 29.5
22	150 13.4	7 9.2	313 23.9	128 10.2	− 1 11.7	124 4.4	− 3 30.8
Δ	2	−9		−3	−13	10	−7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	146 15.3	142	−11 52.5	−133	58 48.3	−23 8.4	178 39.6	8 41.4
2	175 21.6	141	−12 19.2	−132	88 53.3	−23 8.4	208 43.9	8 41.2
4	204 27.8	141	−12 45.6	−131	118 58.3	−23 8.4	238 48.3	8 40.9
6	233 33.9	140	−13 11.7	−129	149 3.3	−23 8.4	268 52.6	8 40.7
8	262 40.0	140	−13 37.6	−128	179 8.3	−23 8.5	298 56.9	8 40.4
10	291 46.0	139	−14 3.1	−126	209 13.3	−23 8.5	329 1.3	8 40.2
12	320 51.8	139	−14 28.4	−125	239 18.3	−23 8.5	359 5.6	8 40.0
14	349 57.6	138	−14 53.4	−123	269 23.3	−23 8.5	29 10.0	8 39.7
16	19 3.2	138	−15 18.1	−122	299 28.4	−23 8.5	59 14.3	8 39.5
18	48 8.7	137	−15 42.5	−120	329 33.4	−23 8.5	89 18.6	8 39.3
20	77 14.1	136	−16 6.6	−119	359 38.4	−23 8.5	119 23.0	8 39.0
22	106 19.4	136	−16 30.3	−117	29 43.4	−23 8.6	149 27.3	8 38.8
Δ					25	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 0	18 57	0 44	2 51	10 18	3.8	18 49	.1
55	5 11	18 47	0 38	2 17	9 58	3.3	19 12	.5
50	5 18	18 39	0 33	1 58	9 42	3.1	19 29	.8
45	5 25	18 33	0 30	1 44	9 30	2.8	19 43	1.0
40	5 30	18 28	0 28	1 34	9 20	2.7	19 54	1.2
35	5 34	18 24	0 26	1 27	9 12	2.5	20 4	1.3
30	5 38	18 20	0 24	1 22	9 5	2.4	20 12	1.4
20	5 45	18 13	0 22	1 15	8 52	2.2	20 27	1.6
10	5 51	18 8	0 21	1 11	8 41	2.0	20 40	1.8
0	5 56	18 3	0 21	1 9	8 31	1.9	20 52	1.9
10	6 1	17 57	0 21	1 10	8 21	1.7	21 4	2.1
20	6 7	17 52	0 22	1 13	8 10	1.5	21 17	2.2
30	6 13	17 46	0 24	1 20	7 58	1.3	21 32	2.4
35	6 16	17 43	0 25	1 24	7 51	1.2	21 41	2.5
40	6 20	17 39	0 27	1 30	7 43	1.1	21 51	2.7
45	6 24	17 35	0 29	1 38	7 34	.9	22 3	2.8
50	6 30	17 30	0 32	1 48	7 23	.7	22 17	3.0
55	6 36	17 23	0 36	2 1	7 9	.5	22 36	3.3
60	6 44	17 15	0 42	2 19	6 51	.1	23 0	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 35.8	.8	15.9	$T_{\overline{m}}$ 14 41	1.9	55.9	15.2
12	0 45.7	$T_{\overline{m}_\odot}$ 11 h 59.2 min		Starost 3.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 27	.1	176	−3.8	♃	20 1	.0	76	−2.3
♂	13 44	.1	171	1.7	♄	12 4	.0	196	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 13.8	7 7.3	343 28.8	158 9.6	− 1 14.2	154 6.3	− 3 32.1
2	210 14.2	7 5.5	13 33.7	188 9.0	− 1 16.8	184 8.3	− 3 33.5
4	240 14.7	7 3.7	43 38.7	218 8.3	− 1 19.4	214 10.3	− 3 34.8
6	270 15.1	7 1.8	73 43.6	248 7.7	− 1 22.0	244 12.2	− 3 36.1
8	300 15.5	7 .0	103 48.5	278 7.1	− 1 24.6	274 14.2	− 3 37.4
10	330 15.9	6 58.1	133 53.4	308 6.4	− 1 27.1	304 16.1	− 3 38.7
12	0 16.3	6 56.3	163 58.4	338 5.8	− 1 29.7	334 18.1	− 3 40.1
14	30 16.7	6 54.4	194 3.3	8 5.1	− 1 32.3	4 20.0	− 3 41.4
16	60 17.1	6 52.6	224 8.2	38 4.5	− 1 34.9	34 22.0	− 3 42.7
18	90 17.6	6 50.7	254 13.2	68 3.9	− 1 37.4	64 23.9	− 3 44.0
20	120 18.0	6 48.8	284 18.1	98 3.2	− 1 40.0	94 25.9	− 3 45.3
22	150 18.4	6 47.0	314 23.0	128 2.6	− 1 42.6	124 27.9	− 3 46.7
Δ	2	−9		−3	−13	10	−7

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER S_{4}	JUPITER δ_{4}	SATURN S_{5}	SATURN δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	135 24.5	135	−16 53.7	−115	59 48.4	−23 8.6	179 31.6	8 38.6
2	164 29.5	134	−17 16.8	−114	89 53.4	−23 8.6	209 36.0	8 38.3
4	193 34.4	134	−17 39.5	−112	119 58.4	−23 8.6	239 40.3	8 38.1
6	222 39.1	133	−18 1.9	−110	150 3.4	−23 8.6	269 44.7	8 37.8
8	251 43.7	132	−18 24.0	−108	180 8.4	−23 8.6	299 49.0	8 37.6
10	280 48.1	131	−18 45.7	−107	210 13.3	−23 8.6	329 53.3	8 37.4
12	309 52.3	130	−19 7.0	−105	240 18.3	−23 8.6	359 57.7	8 37.1
14	338 56.4	130	−19 28.0	−103	270 23.3	−23 8.7	30 2.0	8 36.9
16	8 .4	129	−19 48.6	−101	300 28.3	−23 8.7	60 6.4	8 36.7
18	37 4.1	128	−20 8.8	−99	330 33.3	−23 8.7	90 10.7	8 36.4
20	66 7.7	127	−20 28.6	−97	0 38.3	−23 8.7	120 15.0	8 36.2
22	95 11.2	126	−20 48.1	−95	30 43.3	−23 8.7	150 19.4	8 36.0
Δ					25	0	22	−1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 3	18 54	0 44	2 49	11 49	3.8	18 53	.3
55	5 12	18 44	0 38	2 16	11 18	3.3	19 25	.7
50	5 20	18 37	0 33	1 57	10 56	3.0	19 49	1.0
45	5 26	18 31	0 30	1 44	10 39	2.8	20 7	1.2
40	5 31	18 26	0 28	1 34	10 25	2.6	20 22	1.4
35	5 35	18 22	0 26	1 27	10 13	2.5	20 35	1.5
30	5 39	18 19	0 24	1 22	10 3	2.4	20 46	1.6
20	5 45	18 12	0 22	1 14	9 45	2.2	21 6	1.7
10	5 51	18 7	0 21	1 11	9 30	2.1	21 22	1.9
0	5 56	18 2	0 21	1 9	9 16	1.9	21 38	2.0
10	6 1	17 57	0 21	1 10	9 2	1.8	21 54	2.1
20	6 6	17 52	0 22	1 13	8 47	1.7	22 11	2.2
30	6 11	17 47	0 24	1 19	8 30	1.5	22 31	2.4
35	6 15	17 44	0 25	1 24	8 20	1.4	22 42	2.5
40	6 18	17 40	0 27	1 30	8 9	1.3	22 55	2.6
45	6 23	17 36	0 29	1 38	7 56	1.1	23 11	2.8
50	6 27	17 31	0 32	1 48	7 40	.9	23 30	2.9
55	6 34	17 25	0 36	2 1	7 20	.6	23 55	3.2
60	6 41	17 18	0 42	2 19	6 54	.2	.. ..	.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 55.5	.8	15.9	$T_{\overline{m}}$ 15 27	2.0	55.3	15.1
12	1 5.5	$T_{\overline{m}_\odot}$ 11 h 58.9 min		Starost 4.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 28	.1	175	−3.8	♃	19 57	.0	76	−2.3
♂	13 43	.1	171	1.7	♄	12 0	.0	196	1.0

UT	SUNCE $S_{\odot}$	SUNCE $\delta_{\odot}$	PROLEĆ. TAČKA $S_{♈}$	VENERA $S_{♀}$	VENERA $\delta_{♀}$	MARS $S_{♂}$	MARS $\delta_{♂}$
h	° '	° '	° '	° '	° '	° '	° '
0	180 18.8	6 45.1	344 27.9	158 2.0	- 1 45.2	154 29.8	- 3 48.0
2	210 19.2	6 43.3	14 32.9	188 1.3	- 1 47.7	184 31.8	- 3 49.3
4	240 19.7	6 41.4	44 37.8	218 .7	- 1 50.3	214 33.7	- 3 50.6
6	270 20.1	6 39.6	74 42.7	248 .1	- 1 52.9	244 35.7	- 3 51.9
8	300 20.5	6 37.7	104 47.7	277 59.4	- 1 55.5	274 37.6	- 3 53.3
10	330 20.9	6 35.9	134 52.6	307 58.8	- 1 58.0	304 39.6	- 3 54.6
12	0 21.3	6 34.0	164 57.5	337 58.1	- 2 .6	334 41.5	- 3 55.9
14	30 21.7	6 32.1	195 2.4	7 57.5	- 2 3.2	4 43.5	- 3 57.2
16	60 22.2	6 30.3	225 7.4	37 56.9	- 2 5.8	34 45.4	- 3 58.5
18	90 22.6	6 28.4	255 12.3	67 56.2	- 2 8.3	64 47.3	- 3 59.9
20	120 23.0	6 26.5	285 17.2	97 55.6	- 2 10.9	94 49.3	- 4 1.2
22	150 23.4	6 24.7	315 22.2	127 55.0	- 2 13.5	124 51.2	- 4 2.5
Δ	2	-9		-3	-13	10	-7

UT	MESEC $S_{☾}$	Δ	MESEC $\delta_{☾}$	Δ	JUPITER $S_{♃}$	JUPITER $\delta_{♃}$	SATURN $S_{♄}$	SATURN $\delta_{♄}$
h	° '		° '		° '	° '	° '	° '
0	124 14.5	125	-21 7.1	-93	60 48.3	-23 8.7	180 23.7	8 35.7
2	153 17.5	125	-21 25.8	-91	90 53.2	-23 8.7	210 28.0	8 35.5
4	182 20.5	124	-21 44.0	-89	120 58.2	-23 8.7	240 32.4	8 35.2
6	211 23.2	123	-22 1.8	-87	151 3.2	-23 8.7	270 36.7	8 35.0
8	240 25.8	122	-22 19.2	-85	181 8.2	-23 8.8	300 41.1	8 34.8
10	269 28.2	121	-22 36.2	-83	211 13.2	-23 8.8	330 45.4	8 34.5
12	298 30.4	120	-22 52.8	-81	241 18.1	-23 8.8	0 49.7	8 34.3
14	327 32.4	119	-23 8.9	-79	271 23.1	-23 8.8	30 54.1	8 34.1
16	356 34.3	118	-23 24.6	-76	301 28.1	-23 8.8	60 58.4	8 33.8
18	25 36.0	118	-23 39.9	-74	331 33.1	-23 8.8	91 2.7	8 33.6
20	54 37.5	117	-23 54.7	-72	1 38.0	-23 8.8	121 7.1	8 33.4
22	83 38.8	116	-24 9.1	-70	31 43.0	-23 8.8	151 11.4	8 33.1
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 5	18 51	0 44	2 47	13 20	3.7	18 59	.5
55	5 14	18 42	0 38	2 15	12 37	3.1	19 43	1.1
50	5 21	18 35	0 33	1 56	12 8	2.9	20 13	1.3
45	5 27	18 29	0 30	1 43	11 46	2.7	20 36	1.5
40	5 32	18 25	0 27	1 34	11 28	2.6	20 55	1.6
35	5 36	18 21	0 26	1 27	11 13	2.5	21 10	1.7
30	5 39	18 17	0 24	1 22	11 1	2.4	21 24	1.8
20	5 45	18 12	0 22	1 14	10 39	2.2	21 47	1.9
10	5 51	18 6	0 21	1 10	10 20	2.1	22 7	2.0
0	5 55	18 2	0 21	1 9	10 3	2.0	22 26	2.1
10	5 60	17 57	0 21	1 10	9 45	1.9	22 45	2.1
20	6 5	17 53	0 22	1 13	9 27	1.8	23 5	2.2
30	6 10	17 47	0 24	1 19	9 6	1.7	23 28	2.4
35	6 13	17 44	0 25	1 24	8 53	1.6	23 42	2.4
40	6 17	17 41	0 27	1 30	8 39	1.5	23 58	2.5
45	6 21	17 37	0 29	1 38	8 22	1.3	.. ..	.0
50	6 25	17 33	0 32	1 48	8 2	1.2	.. ..	.0
55	6 31	17 27	0 36	2 1	7 35	.9	.. ..	.0
60	6 38	17 20	0 42	2 19	6 58	.4	0 32	3.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_{☾}$	r
h	min s	s	'	h min	min	'	'
00	1 15.4	.8	15.9	$T_{\overline{m}}$ 16 14	2.0	54.8	14.9
12	1 25.5	$T_{\overline{m}\odot}$ 11 h 58.6 min		Starost 5.2 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	'	°			h min	'	°	
♀	13 28	.1	174	-3.8	♃	19 53	.0	76	-2.3
♂	13 41	.1	170	1.7	♄	11 57	.0	196	1.0

UT	SUNCE $S_{\odot}$	SUNCE $\delta_{\odot}$	PROLEĆ. TAČKA $S_{♈}$	VENERA $S_{♀}$	VENERA $\delta_{♀}$	MARS $S_{♂}$	MARS $\delta_{♂}$
h	° '	° '	° '	° '	° '	° '	° '
0	180 23.9	6 22.8	345 27.1	157 54.3	- 2 16.1	154 53.2	- 4 3.8
2	210 24.3	6 21.0	15 32.0	187 53.7	- 2 18.6	184 55.1	- 4 5.1
4	240 24.7	6 19.1	45 36.9	217 53.0	- 2 21.2	214 57.1	- 4 6.5
6	270 25.1	6 17.2	75 41.9	247 52.4	- 2 23.8	244 59.0	- 4 7.8
8	300 25.5	6 15.4	105 46.8	277 51.8	- 2 26.4	275 1.0	- 4 9.1
10	330 26.0	6 13.5	135 51.7	307 51.1	- 2 28.9	305 2.9	- 4 10.4
12	0 26.4	6 11.6	165 56.7	337 50.5	- 2 31.5	335 4.9	- 4 11.7
14	30 26.8	6 9.8	196 1.6	7 49.9	- 2 34.1	5 6.8	- 4 13.1
16	60 27.2	6 7.9	226 6.5	37 49.2	- 2 36.7	35 8.7	- 4 14.4
18	90 27.7	6 6.0	256 11.4	67 48.6	- 2 39.2	65 10.7	- 4 15.7
20	120 28.1	6 4.1	286 16.4	97 47.9	- 2 41.8	95 12.6	- 4 17.0
22	150 28.5	6 2.3	316 21.3	127 47.3	- 2 44.4	125 14.6	- 4 18.3
Δ	2	-9		-3	-13	10	-7

UT	MESEC $S_{☾}$	Δ	MESEC $\delta_{☾}$	Δ	JUPITER $S_{♃}$	JUPITER $\delta_{♃}$	SATURN $S_{♄}$	SATURN $\delta_{♄}$
h	° '		° '		° '	° '	° '	° '
0	112 40.0	115	-24 23.0	-67	61 48.0	-23 8.8	181 15.8	8 32.9
2	141 41.0	114	-24 36.4	-65	91 52.9	-23 8.8	211 20.1	8 32.6
4	170 41.8	113	-24 49.4	-63	121 57.9	-23 8.8	241 24.4	8 32.4
6	199 42.5	113	-25 1.9	-60	152 2.8	-23 8.9	271 28.8	8 32.2
8	228 43.0	112	-25 14.0	-58	182 7.8	-23 8.9	301 33.1	8 31.9
10	257 43.3	111	-25 25.5	-55	212 12.8	-23 8.9	331 37.4	8 31.7
12	286 43.5	110	-25 36.6	-53	242 17.7	-23 8.9	1 41.8	8 31.5
14	315 43.6	109	-25 47.2	-51	272 22.7	-23 8.9	31 46.1	8 31.2
16	344 43.4	109	-25 57.4	-48	302 27.6	-23 8.9	61 50.5	8 31.0
18	13 43.2	108	-26 7.0	-46	332 32.6	-23 8.9	91 54.8	8 30.7
20	42 42.8	107	-26 16.1	-43	2 37.5	-23 8.9	121 59.1	8 30.5
22	71 42.2	107	-26 24.8	-41	32 42.5	-23 8.9	152 3.5	8 30.3
Δ					25	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 7	18 48	0 44	2 45	14 48	3.2	19 12	1.2
55	5 16	18 39	0 37	2 15	13 52	2.8	20 9	1.6
50	5 23	18 33	0 33	1 56	13 17	2.6	20 45	1.7
45	5 28	18 27	0 30	1 43	12 50	2.5	21 12	1.8
40	5 33	18 23	0 27	1 34	12 30	2.4	21 33	1.9
35	5 37	18 19	0 26	1 27	12 13	2.4	21 51	1.9
30	5 40	18 16	0 24	1 21	11 58	2.3	22 6	2.0
20	5 46	18 11	0 22	1 14	11 33	2.2	22 32	2.0
10	5 50	18 6	0 21	1 10	11 11	2.2	22 54	2.1
0	5 55	18 2	0 21	1 9	10 51	2.1	23 15	2.1
10	5 59	17 57	0 21	1 10	10 31	2.0	23 36	2.2
20	6 4	17 53	0 22	1 13	10 10	2.0	23 59	2.2
30	6 9	17 48	0 24	1 19	9 45	1.9	.. ..	.0
35	6 12	17 45	0 25	1 24	9 31	1.8	.. ..	.0
40	6 15	17 42	0 27	1 30	9 14	1.7	.. ..	.0
45	6 19	17 38	0 29	1 38	8 55	1.7	0 17	2.6
50	6 23	17 34	0 32	1 48	8 30	1.5	0 41	2.7
55	6 29	17 29	0 36	2 1	7 57	1.3	1 14	3.0
60	6 35	17 22	0 42	2 20	7 7	.8	2 2	3.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_{☾}$	r
h	min s	s	'	h min	min	'	'
00	1 35.6	.8	15.9	$T_{\overline{m}}$ 17 3	2.1	54.5	14.8
12	1 45.8	$T_{\overline{m}\odot}$ 11 h 58.2 min		Starost 6.2 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	'	°			h min	'	°	
♀	13 29	.1	172	-3.8	♃	19 50	.0	76	-2.3
♂	13 40	.1	169	1.7	♄	11 53	.0	196	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 29.0	6 .4	346 26.2	157 46.7	− 2 46.9	155 16.5	− 4 19.7
2	210 29.4	5 58.5	16 31.2	187 46.0	− 2 49.5	185 18.4	− 4 21.0
4	240 29.8	5 56.7	46 36.1	217 45.4	− 2 52.1	215 20.4	− 4 22.3
6	270 30.2	5 54.8	76 41.0	247 44.7	− 2 54.7	245 22.3	− 4 23.6
8	300 30.7	5 52.9	106 45.9	277 44.1	− 2 57.2	275 24.3	− 4 24.9
10	330 31.1	5 51.0	136 50.9	307 43.4	− 2 59.8	305 26.2	− 4 26.2
12	0 31.5	5 49.2	166 55.8	337 42.8	− 3 2.4	335 28.1	− 4 27.6
14	30 31.9	5 47.3	197 .7	7 42.2	− 3 4.9	5 30.1	− 4 28.9
16	60 32.4	5 45.4	227 5.7	37 41.5	− 3 7.5	35 32.0	− 4 30.2
18	90 32.8	5 43.5	257 10.6	67 40.9	− 3 10.1	65 33.9	− 4 31.5
20	120 33.2	5 41.6	287 15.5	97 40.2	− 3 12.6	95 35.9	− 4 32.8
22	150 33.7	5 39.8	317 20.4	127 39.6	− 3 15.2	125 37.8	− 4 34.1
Δ	2	−9		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	100 41.6	106	−26 32.9	−38	62 47.4	−23 8.9	182 7.8	8 30.0
2	129 40.8	105	−26 40.5	−36	92 52.4	−23 8.9	212 12.1	8 29.8
4	158 39.9	105	−26 47.6	−33	122 57.3	−23 8.9	242 16.5	8 29.6
6	187 38.8	104	−26 54.3	−31	153 2.3	−23 9.0	272 20.8	8 29.3
8	216 37.7	104	−27 .3	−28	183 7.2	−23 9.0	302 25.2	8 29.1
10	245 36.4	103	−27 5.9	−25	213 12.2	−23 9.0	332 29.5	8 28.9
12	274 35.1	103	−27 11.0	−23	243 17.1	−23 9.0	2 33.8	8 28.6
14	303 33.7	102	−27 15.5	−20	273 22.0	−23 9.0	32 38.2	8 28.4
16	332 32.1	102	−27 19.6	−18	303 27.0	−23 9.0	62 42.5	8 28.1
18	1 30.5	102	−27 23.1	−15	333 31.9	−23 9.0	92 46.9	8 27.9
20	30 28.9	101	−27 26.0	−12	3 36.8	−23 9.0	122 51.2	8 27.7
22	59 27.2	101	−27 28.5	−10	33 41.8	−23 9.0	152 55.5	8 27.4
Δ					25	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 10	18 45	0 43	2 43	16 6	2.2	19 39	2.2
55	5 18	18 37	0 37	2 14	14 59	2.2	20 47	2.2
50	5 24	18 30	0 33	1 55	14 19	2.2	21 27	2.2
45	5 29	18 26	0 30	1 43	13 50	2.2	21 56	2.2
40	5 34	18 21	0 27	1 33	13 28	2.2	22 19	2.2
35	5 37	18 18	0 26	1 26	13 9	2.2	22 37	2.2
30	5 40	18 15	0 24	1 21	12 53	2.2	22 54	2.2
20	5 46	18 10	0 22	1 14	12 26	2.2	23 21	2.2
10	5 50	18 5	0 21	1 10	12 3	2.1	23 44	2.2
0	5 55	18 1	0 21	1 9	11 41	2.1	.. ..	.0
10	5 59	17 57	0 21	1 10	11 20	2.1	.. ..	.0
20	6 3	17 53	0 22	1 13	10 57	2.1	.. ..	.0
30	6 8	17 48	0 24	1 19	10 30	2.1	0 25	2.2
35	6 11	17 46	0 25	1 24	10 15	2.1	0 40	2.3
40	6 14	17 43	0 27	1 30	9 56	2.0	0 58	2.3
45	6 17	17 40	0 29	1 38	9 34	2.0	1 20	2.3
50	6 21	17 36	0 32	1 48	9 7	2.0	1 47	2.4
55	6 26	17 31	0 36	2 1	8 28	1.9	2 25	2.5
60	6 32	17 25	0 42	2 20	7 27	1.7	3 26	2.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	1 56.0	.9	15.9	$T_{\overline{m}}$ 17 54	2.1	54.3	14.8
12	2 6.3	$T_{\overline{m}_\odot}$ 11 h 57.9 min		Starost 7.2 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 29	.1	171	−3.8	♄	19 46	.0	76	−2.3
♂	13 38	.1	169	1.7	♃	11 50	.0	196	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 34.1	5 37.9	347 25.4	157 39.0	− 3 17.8	155 39.7	− 4 35.5
2	210 34.5	5 36.0	17 30.3	187 38.3	− 3 20.3	185 41.7	− 4 36.8
4	240 35.0	5 34.1	47 35.2	217 37.7	− 3 22.9	215 43.6	− 4 38.1
6	270 35.4	5 32.2	77 40.1	247 37.0	− 3 25.5	245 45.5	− 4 39.4
8	300 35.8	5 30.4	107 45.1	277 36.4	− 3 28.0	275 47.5	− 4 40.7
10	330 36.3	5 28.5	137 50.0	307 35.7	− 3 30.6	305 49.4	− 4 42.1
12	0 36.7	5 26.6	167 54.9	337 35.1	− 3 33.2	335 51.3	− 4 43.4
14	30 37.1	5 24.7	197 59.9	7 34.4	− 3 35.7	5 53.3	− 4 44.7
16	60 37.6	5 22.8	228 4.8	37 33.8	− 3 38.3	35 55.2	− 4 46.0
18	90 38.0	5 20.9	258 9.7	67 33.1	− 3 40.9	65 57.1	− 4 47.3
20	120 38.4	5 19.0	288 14.6	97 32.5	− 3 43.4	95 59.0	− 4 48.6
22	150 38.9	5 17.2	318 19.6	127 31.8	− 3 46.0	126 1.0	− 4 49.9
Δ	2	−9		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	88 25.4	101	−27 30.4	−7	63 46.7	−23 9.0	182 59.9	8 27.2
2	117 23.5	101	−27 31.8	−4	93 51.6	−23 9.0	213 4.2	8 27.0
4	146 21.7	100	−27 32.6	−2	123 56.6	−23 9.0	243 8.5	8 26.7
6	175 19.8	100	−27 33.0	1	154 1.5	−23 9.0	273 12.9	8 26.5
8	204 17.8	100	−27 32.8	4	184 6.4	−23 9.0	303 17.2	8 26.3
10	233 15.9	100	−27 32.0	6	214 11.3	−23 9.0	333 21.6	8 26.0
12	262 13.9	100	−27 30.7	9	244 16.3	−23 9.0	3 25.9	8 25.8
14	291 12.0	100	−27 28.9	12	274 21.2	−23 9.1	33 30.2	8 25.6
16	320 10.0	100	−27 26.6	14	304 26.1	−23 9.1	63 34.6	8 25.3
18	349 8.0	100	−27 23.7	17	334 31.0	−23 9.1	93 38.9	8 25.1
20	18 6.1	100	−27 20.3	20	4 35.9	−23 9.1	123 43.3	8 24.8
22	47 4.2	101	−27 16.3	22	34 40.9	−23 9.1	153 47.6	8 24.6
Δ					25	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 12	18 42	0 43	2 41	16 59	1.1	20 33	3.3
55	5 20	18 34	0 37	2 13	15 52	1.6	21 40	2.8
50	5 26	18 28	0 33	1 55	15 12	1.8	22 20	2.6
45	5 31	18 24	0 30	1 42	14 43	1.8	22 49	2.5
40	5 35	18 20	0 27	1 33	14 20	1.9	23 11	2.4
35	5 38	18 17	0 26	1 26	14 1	2.0	23 30	2.4
30	5 41	18 14	0 24	1 21	13 45	2.0	23 46	2.3
20	5 46	18 9	0 22	1 14	13 18	2.0	.. ..	.0
10	5 50	18 5	0 21	1 10	12 54	2.1	.. ..	.0
0	5 54	18 1	0 21	1 9	12 33	2.1	0 6	2.1
10	5 58	17 57	0 21	1 10	12 11	2.2	0 28	2.1
20	6 2	17 53	0 22	1 13	11 47	2.2	0 51	2.1
30	6 7	17 49	0 24	1 19	11 20	2.3	1 19	2.1
35	6 9	17 47	0 25	1 24	11 4	2.3	1 35	2.1
40	6 12	17 44	0 27	1 30	10 45	2.3	1 53	2.0
45	6 15	17 41	0 29	1 38	10 23	2.4	2 16	2.0
50	6 19	17 37	0 32	1 48	9 54	2.4	2 45	2.0
55	6 24	17 33	0 36	2 1	9 14	2.5	3 25	1.9
60	6 29	17 27	0 42	2 20	8 7	2.8	4 32	1.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 16.6	.9	15.9	$T_{\overline{m}}$ 18 45	2.1	54.3	14.8
12	2 27.0	$T_{\overline{m}_\odot}$ 11 h 57.6 min		Starost 8.2 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 30	.1	170	−3.8	♄	19 42	.0	76	−2.3
♂	13 36	.1	168	1.7	♃	11 46	.0	196	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 39.3	5 15.3	348 24.5	157 31.2	- 3 48.6	156 2.9	- 4 51.3
2	210 39.7	5 13.4	18 29.4	187 30.6	- 3 51.1	186 4.8	- 4 52.6
4	240 40.2	5 11.5	48 34.4	217 29.9	- 3 53.7	216 6.8	- 4 53.9
6	270 40.6	5 9.6	78 39.3	247 29.3	- 3 56.2	246 8.7	- 4 55.2
8	300 41.0	5 7.7	108 44.2	277 28.6	- 3 58.8	276 10.6	- 4 56.5
10	330 41.5	5 5.8	138 49.1	307 28.0	- 4 1.4	306 12.5	- 4 57.8
12	0 41.9	5 3.9	168 54.1	337 27.3	- 4 3.9	336 14.5	- 4 59.2
14	30 42.3	5 2.0	198 59.0	7 26.7	- 4 6.5	6 16.4	- 5 .5
16	60 42.8	5 .1	229 3.9	37 26.0	- 4 9.0	36 18.3	- 5 1.8
18	90 43.2	4 58.3	259 8.9	67 25.4	- 4 11.6	66 20.2	- 5 3.1
20	120 43.7	4 56.4	289 13.8	97 24.7	- 4 14.2	96 22.1	- 5 4.4
22	150 44.1	4 54.5	319 18.7	127 24.0	- 4 16.7	126 24.1	- 5 5.7
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	76 2.3	101	-27 11.9	25	64 45.8	-23 9.1	183 51.9	8 24.4
2	105 .5	101	-27 6.8	28	94 50.7	-23 9.1	213 56.3	8 24.1
4	133 58.7	101	-27 1.3	30	124 55.6	-23 9.1	244 .6	8 23.9
6	162 57.0	102	-26 55.2	33	155 .5	-23 9.1	274 4.9	8 23.7
8	191 55.3	102	-26 48.6	36	185 5.4	-23 9.1	304 9.3	8 23.4
10	220 53.7	102	-26 41.5	38	215 10.3	-23 9.1	334 13.6	8 23.2
12	249 52.2	103	-26 33.9	41	245 15.2	-23 9.1	4 18.0	8 23.0
14	278 50.7	103	-26 25.7	43	275 20.1	-23 9.1	34 22.3	8 22.7
16	307 49.4	104	-26 17.0	46	305 25.0	-23 9.1	64 26.6	8 22.5
18	336 48.1	104	-26 7.8	49	335 29.9	-23 9.1	94 31.0	8 22.2
20	5 46.9	105	-25 58.1	51	5 34.8	-23 9.1	124 35.3	8 22.0
22	34 45.9	105	-25 47.9	54	35 39.7	-23 9.1	154 39.7	8 21.8
Δ					25	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 14	18 38	0 43	2 40	17 27	.5	21 51	3.8
55	5 22	18 32	0 37	2 12	16 30	1.1	22 47	3.2
50	5 27	18 26	0 33	1 54	15 54	1.3	23 23	2.9
45	5 32	18 22	0 30	1 42	15 27	1.5	23 49	2.8
40	5 36	18 18	0 27	1 33	15 6	1.6	. . ..	.0
35	5 39	18 15	0 25	1 26	14 48	1.7	. . ..	.0
30	5 41	18 12	0 24	1 21	14 33	1.8	. . ..	.0
20	5 46	18 8	0 22	1 14	14 7	1.9	0 13	2.3
10	5 50	18 4	0 21	1 10	13 45	2.0	0 36	2.2
0	5 54	18 0	0 21	1 9	13 24	2.1	0 57	2.1
10	5 58	17 57	0 21	1 10	13 3	2.2	1 19	2.1
20	6 1	17 53	0 22	1 13	12 40	2.3	1 42	2.0
30	6 5	17 49	0 24	1 19	12 14	2.4	2 9	1.9
35	6 8	17 47	0 25	1 24	11 59	2.5	2 24	1.8
40	6 10	17 45	0 27	1 30	11 41	2.5	2 42	1.8
45	6 13	17 42	0 29	1 38	11 20	2.6	3 4	1.7
50	6 17	17 39	0 32	1 48	10 52	2.8	3 32	1.5
55	6 21	17 34	0 36	2 1	10 15	3.0	4 10	1.3
60	6 26	17 29	0 42	2 20	9 14	3.6	5 12	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 37.3	.9	15.9	$T_{\overline{m}}$	19 36	2.1	54.4	14.8
12	2 47.8	$T_{\overline{m}_\odot}$	11 h 57.2 min	Starost	9.2 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 30	.1	169	-3.8	♃	19 38	.0	76	-2.3
♂	13 35	.1	168	1.7	♄	11 43	.0	195	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 44.5	4 52.6	349 23.6	157 23.4	- 4 19.3	156 26.0	- 5 7.1
2	210 45.0	4 50.7	19 28.6	187 22.7	- 4 21.8	186 27.9	- 5 8.4
4	240 45.4	4 48.8	49 33.5	217 22.1	- 4 24.4	216 29.8	- 5 9.7
6	270 45.8	4 46.9	79 38.4	247 21.4	- 4 26.9	246 31.8	- 5 11.0
8	300 46.3	4 45.0	109 43.4	277 20.8	- 4 29.5	276 33.7	- 5 12.3
10	330 46.7	4 43.1	139 48.3	307 20.1	- 4 32.0	306 35.6	- 5 13.6
12	0 47.2	4 41.2	169 53.2	337 19.5	- 4 34.6	336 37.5	- 5 14.9
14	30 47.6	4 39.3	199 58.1	7 18.8	- 4 37.2	6 39.4	- 5 16.3
16	60 48.0	4 37.4	230 3.1	37 18.2	- 4 39.7	36 41.3	- 5 17.6
18	90 48.5	4 35.5	260 8.0	67 17.5	- 4 42.3	66 43.3	- 5 18.9
20	120 48.9	4 33.6	290 12.9	97 16.8	- 4 44.8	96 45.2	- 5 20.2
22	150 49.4	4 31.7	320 17.9	127 16.2	- 4 47.4	126 47.1	- 5 21.5
Δ	2	-9		-3	-13	10	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	63 44.9	106	-25 37.2	56	65 44.6	-23 9.1	184 44.0	8 21.5
2	92 44.1	106	-25 25.9	59	95 49.5	-23 9.1	214 48.3	8 21.3
4	121 43.4	107	-25 14.2	61	125 54.4	-23 9.1	244 52.7	8 21.1
6	150 42.8	108	-25 1.9	64	155 59.3	-23 9.1	274 57.0	8 20.8
8	179 42.3	108	-24 49.2	66	186 4.2	-23 9.1	305 1.4	8 20.6
10	208 41.9	109	-24 36.0	69	216 9.1	-23 9.1	335 5.7	8 20.4
12	237 41.7	110	-24 22.3	71	246 14.0	-23 9.1	5 10.0	8 20.1
14	266 41.7	110	-24 8.1	73	276 18.9	-23 9.1	35 14.4	8 19.9
16	295 41.8	111	-23 53.4	76	306 23.8	-23 9.1	65 18.7	8 19.7
18	324 42.0	112	-23 38.2	78	336 28.6	-23 9.1	95 23.1	8 19.4
20	353 42.3	113	-23 22.6	80	6 33.5	-23 9.1	125 27.4	8 19.2
22	22 42.9	113	-23 6.5	83	36 38.4	-23 9.1	155 31.7	8 18.9
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 17	18 35	0 43	2 38	17 39	.3	23 22	3.9
55	5 24	18 29	0 37	2 11	16 56	.8	. . ..	.0
50	5 29	18 24	0 33	1 54	16 26	1.0	. . ..	.0
45	5 33	18 20	0 30	1 42	16 3	1.2	. . ..	.0
40	5 36	18 17	0 27	1 33	15 45	1.4	0 10	2.6
35	5 39	18 14	0 25	1 26	15 29	1.5	0 27	2.5
30	5 42	18 11	0 24	1 21	15 16	1.6	0 42	2.4
20	5 46	18 7	0 22	1 14	14 53	1.8	1 7	2.3
10	5 50	18 3	0 21	1 10	14 33	1.9	1 28	2.2
0	5 54	18 0	0 21	1 9	14 14	2.0	1 48	2.1
10	5 57	17 57	0 21	1 10	13 55	2.2	2 8	2.0
20	6 0	17 54	0 22	1 13	13 35	2.3	2 29	1.8
30	6 4	17 50	0 24	1 19	13 12	2.5	2 54	1.7
35	6 6	17 48	0 25	1 24	12 58	2.6	3 8	1.6
40	6 9	17 46	0 27	1 30	12 42	2.7	3 25	1.5
45	6 11	17 43	0 29	1 38	12 23	2.8	3 45	1.4
50	6 15	17 40	0 32	1 48	11 59	3.0	4 9	1.2
55	6 18	17 36	0 36	2 1	11 27	3.3	4 42	.9
60	6 23	17 31	0 42	2 20	10 39	3.9	5 32	.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 58.3	.9	15.9	$T_{\overline{m}}$	20 26	2.0	54.7	14.9
12	3 8.8	$T_{\overline{m}_\odot}$	11 h 56.9 min	Starost	10.2 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 31	.1	168	-3.8	♃	19 34	.0	76	-2.3
♂	13 33	.1	167	1.7	♄	11 39	.0	195	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 49.8	4 29.8	350 22.8	157 15.5	− 4 49.9	156 49.0	− 5 22.8
2	210 50.2	4 27.9	20 27.7	187 14.9	− 4 52.5	186 50.9	− 5 24.1
4	240 50.7	4 26.0	50 32.6	217 14.2	− 4 55.0	216 52.8	− 5 25.4
6	270 51.1	4 24.1	80 37.6	247 13.5	− 4 57.6	246 54.7	− 5 26.8
8	300 51.6	4 22.2	110 42.5	277 12.9	− 5 .1	276 56.7	− 5 28.1
10	330 52.0	4 20.3	140 47.4	307 12.2	− 5 2.6	306 58.6	− 5 29.4
12	0 52.4	4 18.4	170 52.3	337 11.6	− 5 5.2	337 .5	− 5 30.7
14	30 52.9	4 16.5	200 57.3	7 10.9	− 5 7.7	7 2.4	− 5 32.0
16	60 53.3	4 14.6	231 2.2	37 10.2	− 5 10.3	37 4.3	− 5 33.3
18	90 53.8	4 12.7	261 7.1	67 9.6	− 5 12.8	67 6.2	− 5 34.6
20	120 54.2	4 10.8	291 12.1	97 8.9	− 5 15.4	97 8.1	− 5 35.9
22	150 54.7	4 8.8	321 17.0	127 8.2	− 5 17.9	127 10.0	− 5 37.3
Δ	2	−10		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	51 43.5	114	−22 49.9	85	66 43.3	−23 9.1	185 36.1	8 18.7
2	80 44.3	115	−22 32.9	87	96 48.2	−23 9.2	215 40.4	8 18.5
4	109 45.3	116	−22 15.5	90	126 53.0	−23 9.2	245 44.8	8 18.2
6	138 46.4	116	−21 57.5	92	156 57.9	−23 9.2	275 49.1	8 18.0
8	167 47.7	117	−21 39.2	94	187 2.8	−23 9.2	305 53.4	8 17.8
10	196 49.2	118	−21 20.4	96	217 7.7	−23 9.2	335 57.8	8 17.5
12	225 50.7	119	−21 1.2	98	247 12.5	−23 9.2	6 2.1	8 17.3
14	254 52.5	119	−20 41.5	100	277 17.4	−23 9.2	36 6.5	8 17.1
16	283 54.4	120	−20 21.5	102	307 22.3	−23 9.2	66 10.8	8 16.8
18	312 56.4	121	−20 1.0	104	337 27.1	−23 9.2	96 15.1	8 16.6
20	341 58.6	122	−19 40.1	106	7 32.0	−23 9.2	126 19.5	8 16.4
22	11 1.0	123	−19 18.8	108	37 36.9	−23 9.2	156 23.8	8 16.1
Δ					24	0	22	−1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 19	18 32	0 43	2 37	17 45	.1	.. ..	.0
55	5 25	18 26	0 37	2 10	17 14	.5	0 5	3.4
50	5 30	18 22	0 33	1 53	16 51	.8	0 34	3.1
45	5 34	18 18	0 30	1 41	16 33	1.0	0 55	2.9
40	5 37	18 15	0 27	1 33	16 18	1.2	1 13	2.7
35	5 40	18 12	0 25	1 26	16 5	1.3	1 28	2.6
30	5 43	18 10	0 24	1 21	15 54	1.4	1 40	2.5
20	5 47	18 6	0 22	1 14	15 35	1.6	2 2	2.3
10	5 50	18 3	0 21	1 10	15 19	1.8	2 21	2.1
0	5 53	17 60	0 21	1 9	15 3	2.0	2 38	2.0
10	5 56	17 57	0 21	1 10	14 47	2.1	2 55	1.9
20	5 59	17 54	0 22	1 13	14 30	2.3	3 13	1.7
30	6 3	17 51	0 24	1 19	14 11	2.5	3 34	1.5
35	6 5	17 49	0 25	1 24	13 60	2.6	3 47	1.4
40	6 7	17 47	0 27	1 30	13 47	2.8	4 1	1.3
45	6 9	17 44	0 29	1 38	13 31	2.9	4 17	1.1
50	6 12	17 41	0 32	1 48	13 12	3.1	4 38	.9
55	6 16	17 38	0 36	2 2	12 47	3.4	5 4	.6
60	6 20	17 34	0 41	2 21	12 12	3.9	5 41	.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 19.4	.9	15.9	$T_{\overline{m}}$	21 14	2.0	55.2	15.0
12	3 30.0	$T_{\overline{m}_\odot}$	11 h 56.5 min	Starost 11.2 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 31	.1	167	−3.8	♃	19 30	.0	76	−2.3
♂	13 32	.1	166	1.7	♄	11 36	.0	195	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 55.1	4 6.9	351 21.9	157 7.6	− 5 20.5	157 11.9	− 5 38.6
2	210 55.5	4 5.0	21 26.8	187 6.9	− 5 23.0	187 13.8	− 5 39.9
4	240 56.0	4 3.1	51 31.8	217 6.2	− 5 25.5	217 15.8	− 5 41.2
6	270 56.4	4 1.2	81 36.7	247 5.6	− 5 28.1	247 17.7	− 5 42.5
8	300 56.9	3 59.3	111 41.6	277 4.9	− 5 30.6	277 19.6	− 5 43.8
10	330 57.3	3 57.4	141 46.6	307 4.2	− 5 33.1	307 21.5	− 5 45.1
12	0 57.8	3 55.5	171 51.5	337 3.6	− 5 35.7	337 23.4	− 5 46.4
14	30 58.2	3 53.6	201 56.4	7 2.9	− 5 38.2	7 25.3	− 5 47.7
16	60 58.7	3 51.7	232 1.3	37 2.2	− 5 40.8	37 27.2	− 5 49.1
18	90 59.1	3 49.8	262 6.3	67 1.6	− 5 43.3	67 29.1	− 5 50.4
20	120 59.5	3 47.8	292 11.2	97 .9	− 5 45.8	97 31.0	− 5 51.7
22	151 .0	3 45.9	322 16.1	127 .2	− 5 48.4	127 32.9	− 5 53.0
Δ	2	−10		−3	−13	10	−7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	40 3.5	123	−18 57.1	110	67 41.7	−23 9.2	186 28.2	8 15.9
2	69 6.2	124	−18 35.0	112	97 46.6	−23 9.2	216 32.5	8 15.7
4	98 9.0	125	−18 12.5	114	127 51.4	−23 9.2	246 36.8	8 15.4
6	127 11.9	125	−17 49.7	116	157 56.3	−23 9.2	276 41.2	8 15.2
8	156 15.0	126	−17 26.5	118	188 1.2	−23 9.2	306 45.5	8 15.0
10	185 18.2	127	−17 2.9	120	218 6.0	−23 9.2	336 49.9	8 14.7
12	214 21.5	127	−16 39.0	121	248 10.9	−23 9.2	6 54.2	8 14.5
14	243 25.0	128	−16 14.7	123	278 15.7	−23 9.2	36 58.6	8 14.2
16	272 28.6	129	−15 50.0	125	308 20.6	−23 9.2	67 2.9	8 14.0
18	301 32.3	129	−15 25.0	127	338 25.4	−23 9.2	97 7.2	8 13.8
20	330 36.2	130	−14 59.7	128	8 30.3	−23 9.2	127 11.6	8 13.5
22	359 40.1	130	−14 34.1	130	38 35.1	−23 9.1	157 15.9	8 13.3
Δ					24	0	22	−1

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 21	18 29	0 42	2 35	17 49	.1	0 57	3.9
55	5 27	18 24	0 37	2 10	17 27	.4	1 26	3.5
50	5 32	18 20	0 33	1 53	17 11	.7	1 48	3.2
45	5 35	18 16	0 30	1 41	16 57	.9	2 5	2.9
40	5 38	18 13	0 27	1 32	16 47	1.1	2 18	2.8
35	5 41	18 11	0 25	1 26	16 37	1.2	2 30	2.6
30	5 43	18 9	0 24	1 21	16 29	1.3	2 40	2.5
20	5 47	18 5	0 22	1 14	16 15	1.6	2 57	2.3
10	5 50	18 2	0 21	1 10	16 2	1.7	3 12	2.1
0	5 53	17 59	0 21	1 9	15 50	1.9	3 26	1.9
10	5 56	17 57	0 21	1 10	15 38	2.1	3 40	1.8
20	5 59	17 54	0 22	1 13	15 26	2.3	3 54	1.6
30	6 2	17 51	0 24	1 19	15 11	2.5	4 11	1.4
35	6 3	17 49	0 25	1 24	15 2	2.6	4 21	1.3
40	6 5	17 48	0 27	1 30	14 53	2.8	4 32	1.1
45	6 8	17 45	0 29	1 38	14 41	3.0	4 44	1.0
50	6 10	17 43	0 32	1 48	14 27	3.2	4 60	.8
55	6 13	17 40	0 36	2 2	14 9	3.5	5 20	.5
60	6 17	17 36	0 41	2 21	13 45	3.9	5 46	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	3 40.6	.9	15.9	$T_{\overline{m}}$	22 1	1.9	55.8	15.2
12	3 51.3	$T_{\overline{m}_\odot}$	11 h 56.2 min	Starost 12.2 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 32	.1	166	−3.8	♃	19 26	.0	76	−2.3
♂	13 30	.1	166	1.7	♄	11 32	.0	195	1.0

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UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 .4	3 44.0	352 21.1	156 59.5	-5 50.9	157 34.8	-5 54.3
2	211 .9	3 42.1	22 26.0	186 58.9	-5 53.4	187 36.7	-5 55.6
4	241 1.3	3 40.2	52 30.9	216 58.2	-5 56.0	217 38.6	-5 56.9
6	271 1.8	3 38.3	82 35.8	246 57.5	-5 58.5	247 40.5	-5 58.2
8	301 2.2	3 36.4	112 40.8	276 56.8	-6 1.0	277 42.4	-5 59.5
10	331 2.7	3 34.4	142 45.7	306 56.2	-6 3.5	307 44.3	-6 .8
12	1 3.1	3 32.5	172 50.6	336 55.5	-6 6.1	337 46.2	-6 2.1
14	31 3.5	3 30.6	202 55.6	6 54.8	-6 8.6	7 48.1	-6 3.5
16	61 4.0	3 28.7	233 .5	36 54.1	-6 11.1	37 50.0	-6 4.8
18	91 4.4	3 26.8	263 5.4	66 53.5	-6 13.7	67 51.9	-6 6.1
20	121 4.9	3 24.9	293 10.3	96 52.8	-6 16.2	97 53.8	-6 7.4
22	151 5.3	3 22.9	323 15.3	126 52.1	-6 18.7	127 55.7	-6 8.7
Δ	2	-10		-3	-13	9	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	28 44.2	131	-14 8.2	131	68 40.0	-23 9.1	187 20.3	8 13.1
2	57 48.4	131	-13 41.9	133	98 44.8	-23 9.1	217 24.6	8 12.8
4	86 52.6	132	-13 15.4	134	128 49.6	-23 9.1	247 28.9	8 12.6
6	115 57.0	132	-12 48.5	136	158 54.5	-23 9.1	277 33.3	8 12.4
8	145 1.4	133	-12 21.4	137	188 59.3	-23 9.1	307 37.6	8 12.1
10	174 6.0	133	-11 53.9	138	219 4.2	-23 9.1	337 42.0	8 11.9
12	203 10.6	133	-11 26.3	140	249 9.0	-23 9.1	7 46.3	8 11.7
14	232 15.2	134	-10 58.3	141	279 13.8	-23 9.1	37 50.6	8 11.4
16	261 20.0	134	-10 30.1	142	309 18.7	-23 9.1	67 55.0	8 11.2
18	290 24.8	134	-10 1.6	143	339 23.5	-23 9.1	97 59.3	8 11.0
20	319 29.6	134	-9 32.9	145	9 28.3	-23 9.1	128 3.7	8 10.7
22	348 34.5	135	-9 4.0	146	39 33.2	-23 9.1	158 8.0	8 10.5
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 24	18 26	0 42	2 34	17 50	.0	2 30	3.9
55	5 29	18 21	0 37	2 9	17 37	.4	2 49	3.5
50	5 33	18 17	0 33	1 53	17 27	.6	3 4	3.2
45	5 37	18 14	0 30	1 41	17 19	.8	3 15	3.0
40	5 39	18 12	0 27	1 32	17 12	1.0	3 25	2.8
35	5 42	18 9	0 25	1 26	17 6	1.1	3 33	2.6
30	5 44	18 8	0 24	1 20	17 1	1.3	3 40	2.5
20	5 47	18 4	0 22	1 14	16 52	1.5	3 52	2.3
10	5 50	18 2	0 21	1 10	16 44	1.7	4 3	2.1
0	5 53	17 59	0 21	1 9	16 36	1.9	4 12	1.9
10	5 55	17 57	0 21	1 10	16 29	2.1	4 22	1.7
20	5 58	17 54	0 22	1 13	16 20	2.3	4 32	1.5
30	6 0	17 52	0 24	1 19	16 11	2.5	4 44	1.3
35	6 2	17 50	0 25	1 24	16 6	2.7	4 51	1.2
40	6 4	17 48	0 27	1 30	15 59	2.8	4 59	1.0
45	6 6	17 47	0 29	1 38	15 52	3.0	5 7	.9
50	6 8	17 44	0 32	1 48	15 43	3.2	5 18	.7
55	6 11	17 42	0 36	2 2	15 32	3.5	5 31	.4
60	6 14	17 38	0 41	2 21	15 18	3.9	5 48	.1
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 1.9	.9	15.9	$T_{\overline{m}}$ 22 47	1.9	56.4	15.4
12	4 12.6	$T_{\overline{m}_\odot}$ 11 h 55.8 min		Starost 13.2 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 32	.1	165	-3.8	♃	19 22	.0	76	-2.3
♂	13 29	.1	165	1.7	♄	11 29	.0	195	1.0

14. SEPTEMBAR NEDELJA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 5.8	3 21.0	353 20.2	156 51.4	-6 21.2	157 57.6	-6 10.0
2	211 6.2	3 19.1	23 25.1	186 50.7	-6 23.7	187 59.5	-6 11.3
4	241 6.7	3 17.2	53 30.1	216 50.0	-6 26.3	218 1.3	-6 12.6
6	271 7.1	3 15.3	83 35.0	246 49.4	-6 28.8	248 3.2	-6 13.9
8	301 7.6	3 13.3	113 39.9	276 48.7	-6 31.3	278 5.1	-6 15.2
10	331 8.0	3 11.4	143 44.8	306 48.0	-6 33.8	308 7.0	-6 16.5
12	1 8.5	3 9.5	173 49.8	336 47.3	-6 36.3	338 8.9	-6 17.8
14	31 8.9	3 7.6	203 54.7	6 46.6	-6 38.9	8 10.8	-6 19.1
16	61 9.4	3 5.7	233 59.6	36 45.9	-6 41.4	38 12.7	-6 20.5
18	91 9.8	3 3.7	264 4.6	66 45.2	-6 43.9	68 14.6	-6 21.8
20	121 10.3	3 1.8	294 9.5	96 44.6	-6 46.4	98 16.5	-6 23.1
22	151 10.7	2 59.9	324 14.4	126 43.9	-6 48.9	128 18.4	-6 24.4
Δ	2	-10		-3	-13	9	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	17 39.4	135	-8 34.9	147	69 38.0	-23 9.1	188 12.4	8 10.3
2	46 44.4	135	-8 5.5	148	99 42.8	-23 9.1	218 16.7	8 10.0
4	75 49.4	135	-7 35.9	149	129 47.6	-23 9.1	248 21.0	8 9.8
6	104 54.3	135	-7 6.2	150	159 52.5	-23 9.1	278 25.4	8 9.6
8	133 59.4	135	-6 36.2	151	189 57.3	-23 9.1	308 29.7	8 9.3
10	163 4.4	135	-6 6.1	151	220 2.1	-23 9.1	338 34.1	8 9.1
12	192 9.4	135	-5 35.8	152	250 6.9	-23 9.1	8 38.4	8 8.9
14	221 14.3	135	-5 5.3	153	280 11.7	-23 9.1	38 42.8	8 8.6
16	250 19.3	135	-4 34.7	154	310 16.6	-23 9.1	68 47.1	8 8.4
18	279 24.2	134	-4 4.0	154	340 21.4	-23 9.1	98 51.4	8 8.2
20	308 29.1	134	-3 33.1	155	10 26.2	-23 9.1	128 55.8	8 7.9
22	337 34.0	134	-3 2.1	156	40 31.0	-23 9.1	159 .1	8 7.7
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 26	18 23	0 42	2 33	17 51	.0	4 3	3.9
55	5 31	18 19	0 37	2 8	17 46	.4	4 13	3.5
50	5 35	18 15	0 33	1 52	17 42	.6	4 21	3.2
45	5 38	18 12	0 29	1 41	17 39	.8	4 27	3.0
40	5 40	18 10	0 27	1 32	17 36	1.0	4 32	2.8
35	5 42	18 8	0 25	1 25	17 34	1.1	4 36	2.7
30	5 44	18 6	0 24	1 20	17 32	1.3	4 40	2.5
20	5 47	18 3	0 22	1 14	17 28	1.5	4 47	2.3
10	5 50	18 1	0 21	1 10	17 25	1.7	4 53	2.1
0	5 52	17 59	0 21	1 9	17 22	1.9	4 58	1.9
10	5 54	17 57	0 21	1 10	17 19	2.1	5 3	1.7
20	5 57	17 54	0 22	1 13	17 15	2.3	5 9	1.5
30	5 59	17 52	0 24	1 19	17 12	2.6	5 15	1.3
35	6 1	17 51	0 25	1 24	17 9	2.7	5 19	1.1
40	6 2	17 49	0 27	1 30	17 7	2.9	5 23	1.0
45	6 4	17 48	0 29	1 38	17 4	3.0	5 28	.8
50	6 6	17 46	0 32	1 48	17 1	3.3	5 34	.6
55	6 8	17 44	0 36	2 2	16 56	3.5	5 41	.4
60	6 11	17 41	0 41	2 22	16 51	3.9	5 50	.0
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 23.3	.9	15.9	$T_{\overline{m}}$ 23 33	1.9	57.1	15.6
12	4 34.1	$T_{\overline{m}_\odot}$ 11 h 55.4 min		Starost 14.2 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 33	.1	164	-3.8	♃	19 18	.0	76	-2.3
♂	13 27	.1	165	1.7	♄	11 26	.0	195	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 11.1	2 58.0	354 19.3	156 43.2	-6 51.4	158 20.2	-6 25.7
2	211 11.6	2 56.0	24 24.3	186 42.5	-6 53.9	188 22.1	-6 27.0
4	241 12.0	2 54.1	54 29.2	216 41.8	-6 56.5	218 24.0	-6 28.3
6	271 12.5	2 52.2	84 34.1	246 41.1	-6 59.0	248 25.9	-6 29.6
8	301 12.9	2 50.3	114 39.0	276 40.4	-7 1.5	278 27.8	-6 30.9
10	331 13.4	2 48.4	144 44.0	306 39.7	-7 4.0	308 29.7	-6 32.2
12	1 13.8	2 46.4	174 48.9	336 39.0	-7 6.5	338 31.6	-6 33.5
14	31 14.3	2 44.5	204 53.8	6 38.3	-7 9.0	8 33.4	-6 34.8
16	61 14.7	2 42.6	234 58.8	36 37.6	-7 11.5	38 35.3	-6 36.1
18	91 15.2	2 40.6	265 3.7	66 36.9	-7 14.0	68 37.2	-6 37.4
20	121 15.6	2 38.7	295 8.6	96 36.2	-7 16.5	98 39.1	-6 38.7
22	151 16.1	2 36.8	325 13.5	126 35.5	-7 19.0	128 41.0	-6 40.0
Δ	2	-10		-3	-13	9	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	6 38.8	134	-2 31.0	156	70 35.8	-23 9.1	189 4.5	8 7.4
2	35 43.5	133	-1 59.8	157	100 40.6	-23 9.1	219 8.8	8 7.2
4	64 48.1	133	-1 28.5	157	130 45.4	-23 9.1	249 13.2	8 7.0
6	93 52.7	132	-0 57.1	157	160 50.2	-23 9.1	279 17.5	8 6.7
8	122 57.2	132	-0 25.6	158	190 55.0	-23 9.0	309 21.8	8 6.5
10	152 1.6	131	0 5.9	158	220 59.8	-23 9.0	339 26.2	8 6.3
12	181 5.9	131	0 37.5	158	251 4.6	-23 9.0	9 30.5	8 6.0
14	210 10.0	130	1 9.1	158	281 9.4	-23 9.0	39 34.9	8 5.8
16	239 14.1	130	1 40.8	158	311 14.2	-23 9.0	69 39.2	8 5.6
18	268 18.0	129	2 12.5	158	341 19.0	-23 9.0	99 43.6	8 5.3
20	297 21.8	128	2 44.1	158	11 23.8	-23 9.0	129 47.9	8 5.1
22	326 25.4	127	3 15.8	158	41 28.6	-23 9.0	159 52.3	8 4.9
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 28	18 20	0 42	2 32	17 52	.0	5 36	4.0
55	5 33	18 16	0 36	2 8	17 55	.4	5 37	3.6
50	5 36	18 13	0 32	1 52	17 57	.6	5 38	3.3
45	5 39	18 10	0 29	1 40	17 59	.9	5 39	3.1
40	5 41	18 8	0 27	1 32	18 0	1.0	5 40	2.9
35	5 43	18 7	0 25	1 25	18 1	1.2	5 40	2.7
30	5 45	18 5	0 24	1 20	18 2	1.3	5 41	2.6
20	5 47	18 2	0 22	1 14	18 4	1.6	5 42	2.3
10	5 50	18 0	0 21	1 10	18 6	1.8	5 43	2.1
0	5 52	17 58	0 21	1 9	18 8	2.0	5 43	1.9
10	5 54	17 56	0 21	1 10	18 9	2.2	5 44	1.7
20	5 56	17 55	0 22	1 13	18 11	2.4	5 45	1.5
30	5 58	17 53	0 24	1 19	18 13	2.6	5 46	1.3
35	5 59	17 52	0 25	1 24	18 14	2.8	5 46	1.2
40	6 0	17 50	0 27	1 30	18 16	2.9	5 47	1.0
45	6 2	17 49	0 29	1 38	18 17	3.1	5 47	.8
50	6 4	17 47	0 32	1 48	18 19	3.4	5 48	.6
55	6 6	17 45	0 36	2 2	18 21	3.6	5 49	.4
60	6 8	17 43	0 41	2 22	18 24	4.0	5 50	.0
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 44.8	.9	15.9	$T_{\overline{m}}$ . . .	1.0	57.7	15.7
12	4 55.5	$T_{\overline{m}_\odot}$ 11 h 55.1 min		Starost 15.2 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 33	.1	162	-3.8	♃	19 15	.0	76	-2.3
♂	13 26	.1	164	1.7	♄	11 22	.0	195	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 16.5	2 34.9	355 18.5	156 34.8	-7 21.5	158 42.8	-6 41.3
2	211 17.0	2 32.9	25 23.4	186 34.1	-7 24.0	188 44.7	-6 42.6
4	241 17.4	2 31.0	55 28.3	216 33.4	-7 26.5	218 46.6	-6 43.9
6	271 17.9	2 29.1	85 33.3	246 32.7	-7 29.0	248 48.5	-6 45.2
8	301 18.3	2 27.2	115 38.2	276 32.0	-7 31.5	278 50.4	-6 46.5
10	331 18.8	2 25.2	145 43.1	306 31.3	-7 34.0	308 52.2	-6 47.8
12	1 19.2	2 23.3	175 48.0	336 30.6	-7 36.5	338 54.1	-6 49.1
14	31 19.7	2 21.4	205 53.0	6 29.9	-7 39.0	8 56.0	-6 50.5
16	61 20.1	2 19.4	235 57.9	36 29.2	-7 41.5	38 57.9	-6 51.8
18	91 20.6	2 17.5	266 2.8	66 28.5	-7 44.0	68 59.7	-6 53.1
20	121 21.0	2 15.6	296 7.8	96 27.8	-7 46.4	99 1.6	-6 54.4
22	151 21.5	2 13.6	326 12.7	126 27.0	-7 48.9	129 3.5	-6 55.7
Δ	2	-10		-4	-12	9	-7

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	355 28.8	126	3 47.5	158	71 33.4	-23 9.0	189 56.6	8 4.6
2	24 32.1	126	4 19.1	158	101 38.2	-23 9.0	220 .9	8 4.4
4	53 35.3	125	4 50.7	158	131 43.0	-23 9.0	250 5.3	8 4.2
6	82 38.2	124	5 22.2	157	161 47.8	-23 9.0	280 9.6	8 3.9
8	111 40.9	123	5 53.7	157	191 52.6	-23 9.0	310 14.0	8 3.7
10	140 43.5	122	6 25.1	157	221 57.4	-23 9.0	340 18.3	8 3.5
12	169 45.8	121	6 56.4	156	252 2.2	-23 9.0	10 22.7	8 3.2
14	198 47.9	119	7 27.7	156	282 6.9	-23 9.0	40 27.0	8 3.0
16	227 49.8	118	7 58.8	155	312 11.7	-23 8.9	70 31.4	8 2.8
18	256 51.4	117	8 29.8	154	342 16.5	-23 8.9	100 35.7	8 2.5
20	285 52.8	116	9 .6	154	12 21.3	-23 8.9	130 40.0	8 2.3
22	314 53.9	114	9 31.4	153	42 26.1	-23 8.9	160 44.4	8 2.1
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 31	18 17	0 42	2 31	17 53	.1	7 10	4.1
55	5 35	18 14	0 36	2 7	18 4	.5	7 3	3.7
50	5 38	18 11	0 32	1 51	18 12	.7	6 57	3.4
45	5 40	18 9	0 29	1 40	18 19	1.0	6 53	3.2
40	5 42	18 7	0 27	1 32	18 25	1.2	6 49	3.0
35	5 44	18 5	0 25	1 25	18 30	1.3	6 46	2.8
30	5 45	18 4	0 24	1 20	18 34	1.4	6 43	2.7
20	5 48	18 2	0 22	1 13	18 42	1.7	6 38	2.4
10	5 50	17 60	0 21	1 10	18 49	1.9	6 34	2.2
0	5 51	17 58	0 21	1 9	18 55	2.1	6 30	2.0
10	5 53	17 56	0 21	1 10	19 1	2.3	6 26	1.8
20	5 55	17 55	0 22	1 13	19 8	2.5	6 22	1.6
30	5 57	17 53	0 24	1 20	19 16	2.7	6 17	1.4
35	5 58	17 52	0 25	1 24	19 21	2.9	6 14	1.2
40	5 59	17 51	0 27	1 30	19 26	3.0	6 11	1.1
45	6 0	17 50	0 29	1 38	19 32	3.2	6 7	.9
50	6 1	17 49	0 32	1 49	19 40	3.5	6 3	.7
55	6 3	17 47	0 36	2 3	19 49	3.8	5 58	.4
60	6 5	17 45	0 41	2 23	20 1	4.2	5 51	.1
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 6.3	.9	15.9	$T_{\overline{m}}$ 0 19	2.0	58.3	15.9
12	5 17.1	$T_{\overline{m}_\odot}$ 11 h 54.7 min		Starost 16.2 d	Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 34	.1	161	-3.8	♃	19 11	.0	76	-2.3
♂	13 24	.1	163	1.7	♄	11 19	.0	195	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 21.9	2 11.7	356 17.6	156 26.3	− 7 51.4	159 5.4	− 6 57.0
2	211 22.4	2 9.8	26 22.5	186 25.6	− 7 53.9	189 7.2	− 6 58.3
4	241 22.8	2 7.8	56 27.5	216 24.9	− 7 56.4	219 9.1	− 6 59.6
6	271 23.2	2 5.9	86 32.4	246 24.2	− 7 58.9	249 11.0	− 7 .9
8	301 23.7	2 4.0	116 37.3	276 23.5	− 8 1.4	279 12.8	− 7 2.2
10	331 24.1	2 2.0	146 42.3	306 22.8	− 8 3.8	309 14.7	− 7 3.5
12	1 24.6	2 .1	176 47.2	336 22.0	− 8 6.3	339 16.6	− 7 4.8
14	31 25.0	1 58.2	206 52.1	6 21.3	− 8 8.8	9 18.4	− 7 6.1
16	61 25.5	1 56.2	236 57.0	36 20.6	− 8 11.3	39 20.3	− 7 7.4
18	91 25.9	1 54.3	267 2.0	66 19.9	− 8 13.8	69 22.2	− 7 8.7
20	121 26.4	1 52.4	297 6.9	96 19.2	− 8 16.2	99 24.0	− 7 10.0
22	151 26.8	1 50.4	327 11.8	126 18.4	− 8 18.7	129 25.9	− 7 11.3
Δ	2	−10		−4	−12	9	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	343 54.8	113	10 1.9	152	72 30.8	−23 8.9	190 48.7	8 1.8
2	12 55.4	112	10 32.3	151	102 35.6	−23 8.9	220 53.1	8 1.6
4	41 55.7	110	11 2.5	150	132 40.4	−23 8.9	250 57.4	8 1.4
6	70 55.8	109	11 32.5	149	162 45.2	−23 8.9	281 1.8	8 1.1
8	99 55.5	107	12 2.2	148	192 49.9	−23 8.9	311 6.1	8 .9
10	128 54.9	106	12 31.8	147	222 54.7	−23 8.9	341 10.5	8 .7
12	157 54.1	104	13 1.1	145	252 59.5	−23 8.9	11 14.8	8 .4
14	186 52.9	102	13 30.2	144	283 4.2	−23 8.9	41 19.2	8 .2
16	215 51.4	101	13 58.9	143	313 9.0	−23 8.8	71 23.5	7 60.0
18	244 49.5	99	14 27.5	141	343 13.8	−23 8.8	101 27.8	7 59.8
20	273 47.3	97	14 55.7	140	13 18.5	−23 8.8	131 32.2	7 59.5
22	302 44.8	96	15 23.6	138	43 23.3	−23 8.8	161 36.5	7 59.3
Δ					24	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 33	18 14	0 42	2 30	17 56	.2	8 49	4.3
55	5 37	18 11	0 36	2 7	18 15	.6	8 32	3.9
50	5 39	18 9	0 32	1 51	18 30	.9	8 19	3.5
45	5 41	18 7	0 29	1 40	18 42	1.2	8 9	3.3
40	5 43	18 5	0 27	1 31	18 52	1.3	8 1	3.1
35	5 44	18 4	0 25	1 25	19 1	1.5	7 54	2.9
30	5 46	18 3	0 24	1 20	19 9	1.6	7 47	2.8
20	5 48	18 1	0 22	1 13	19 22	1.9	7 37	2.5
10	5 50	17 59	0 21	1 10	19 34	2.1	7 27	2.3
0	5 51	17 58	0 21	1 9	19 45	2.2	7 18	2.2
10	5 53	17 56	0 21	1 10	19 56	2.4	7 10	2.0
20	5 54	17 55	0 22	1 13	20 8	2.6	7 0	1.8
30	5 55	17 54	0 24	1 20	20 22	2.8	6 50	1.5
35	5 56	17 53	0 25	1 24	20 30	3.0	6 44	1.4
40	5 57	17 52	0 27	1 30	20 39	3.1	6 37	1.2
45	5 58	17 51	0 29	1 38	20 50	3.3	6 29	1.0
50	5 59	17 50	0 32	1 49	21 3	3.6	6 19	.8
55	6 1	17 49	0 36	2 3	21 20	3.9	6 8	.5
60	6 2	17 48	0 41	2 23	21 43	4.5	5 53	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	5 27.8	.9	15.9	$T_{\overline{m}}$	1 7	2.1	58.8	16.0
12	5 38.6	$T_{\overline{m}_\odot}$	11 h 54.4 min	Starost 17.2 d		Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 35	.1	160	−3.8	♃	19 7	.0	76	−2.3
♂	13 23	.1	163	1.7	♄	11 15	.0	195	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 27.3	1 48.5	357 16.8	156 17.7	− 8 21.2	159 27.8	− 7 12.6
2	211 27.7	1 46.6	27 21.7	186 17.0	− 8 23.6	189 29.6	− 7 13.9
4	241 28.2	1 44.6	57 26.6	216 16.3	− 8 26.1	219 31.5	− 7 15.2
6	271 28.6	1 42.7	87 31.5	246 15.5	− 8 28.6	249 33.4	− 7 16.4
8	301 29.1	1 40.8	117 36.5	276 14.8	− 8 31.1	279 35.2	− 7 17.7
10	331 29.5	1 38.8	147 41.4	306 14.1	− 8 33.5	309 37.1	− 7 19.0
12	1 30.0	1 36.9	177 46.3	336 13.3	− 8 36.0	339 38.9	− 7 20.3
14	31 30.4	1 34.9	207 51.2	6 12.6	− 8 38.5	9 40.8	− 7 21.6
16	61 30.9	1 33.0	237 56.2	36 11.9	− 8 40.9	39 42.7	− 7 22.9
18	91 31.3	1 31.1	268 1.1	66 11.1	− 8 43.4	69 44.5	− 7 24.2
20	121 31.8	1 29.1	298 6.0	96 10.4	− 8 45.8	99 46.4	− 7 25.5
22	151 32.2	1 27.2	328 11.0	126 9.7	− 8 48.3	129 48.2	− 7 26.8
Δ	2	−10		−4	−12	9	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	331 42.0	94	15 51.2	136	73 28.1	−23 8.8	191 40.9	7 59.1
2	0 38.7	92	16 18.4	135	103 32.8	−23 8.8	221 45.2	7 58.8
4	29 35.2	90	16 45.3	133	133 37.6	−23 8.8	251 49.6	7 58.6
6	58 31.2	88	17 11.8	131	163 42.3	−23 8.8	281 53.9	7 58.4
8	87 26.9	87	17 38.0	129	193 47.1	−23 8.8	311 58.3	7 58.1
10	116 22.2	85	18 3.8	127	223 51.8	−23 8.8	342 2.6	7 57.9
12	145 17.2	83	18 29.1	125	253 56.6	−23 8.7	12 7.0	7 57.7
14	174 11.8	81	18 54.1	123	284 1.3	−23 8.7	42 11.3	7 57.4
16	203 6.0	79	19 18.6	120	314 6.1	−23 8.7	72 15.7	7 57.2
18	231 59.8	77	19 42.6	118	344 10.8	−23 8.7	102 20.0	7 57.0
20	260 53.3	75	20 6.2	116	14 15.6	−23 8.7	132 24.4	7 56.7
22	289 46.3	73	20 29.3	113	44 20.3	−23 8.7	162 28.7	7 56.5
Δ					24	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 36	18 11	0 42	2 29	17 60	.4	10 33	4.5
55	5 38	18 8	0 36	2 6	18 30	.9	10 5	3.9
50	5 41	18 6	0 32	1 51	18 53	1.2	9 44	3.6
45	5 43	18 5	0 29	1 40	19 10	1.5	9 28	3.3
40	5 44	18 3	0 27	1 31	19 25	1.6	9 15	3.2
35	5 45	18 2	0 25	1 25	19 37	1.8	9 4	3.0
30	5 46	18 1	0 24	1 20	19 48	1.9	8 54	2.9
20	5 48	17 60	0 22	1 13	20 7	2.1	8 38	2.7
10	5 49	17 58	0 21	1 10	20 23	2.2	8 23	2.5
0	5 51	17 57	0 21	1 9	20 39	2.4	8 10	2.3
10	5 52	17 56	0 21	1 10	20 54	2.5	7 57	2.1
20	5 53	17 55	0 22	1 13	21 11	2.7	7 42	2.0
30	5 54	17 54	0 24	1 20	21 30	2.9	7 26	1.8
35	5 55	17 54	0 25	1 24	21 41	3.0	7 17	1.6
40	5 55	17 53	0 27	1 30	21 55	3.2	7 6	1.5
45	5 56	17 53	0 29	1 38	22 10	3.3	6 54	1.3
50	5 57	17 52	0 32	1 49	22 29	3.6	6 39	1.1
55	5 58	17 51	0 36	2 3	22 54	3.9	6 20	.7
60	5 59	17 50	0 42	2 24	23 29	4.6	5 55	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	5 49.3	.9	15.9	$T_{\overline{m}}$	1 57	2.3	59.1	16.1
12	6 .1	$T_{\overline{m}_\odot}$	11 h 54.0 min	Starost 18.2 d		Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 35	.1	159	−3.8	♃	19 3	.0	76	−2.2
♂	13 21	.1	162	1.7	♄	11 12	.0	194	1.1

19. SEPTEMBAR 2008. PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 32.6	1 25.3	358 15.9	156 8.9	− 8 50.8	159 50.1	− 7 28.1
2	211 33.1	1 23.3	28 20.8	186 8.2	− 8 53.2	189 52.0	− 7 29.4
4	241 33.5	1 21.4	58 25.7	216 7.5	− 8 55.7	219 53.8	− 7 30.7
6	271 34.0	1 19.4	88 30.7	246 6.7	− 8 58.1	249 55.7	− 7 32.0
8	301 34.4	1 17.5	118 35.6	276 6.0	− 9 .6	279 57.5	− 7 33.3
10	331 34.9	1 15.6	148 40.5	306 5.2	− 9 3.0	309 59.4	− 7 34.6
12	1 35.3	1 13.6	178 45.5	336 4.5	− 9 5.5	340 1.2	− 7 35.9
14	31 35.8	1 11.7	208 50.4	6 3.7	− 9 7.9	10 3.1	− 7 37.2
16	61 36.2	1 9.7	238 55.3	36 3.0	− 9 10.4	40 4.9	− 7 38.5
18	91 36.7	1 7.8	269 .2	66 2.2	− 9 12.8	70 6.8	− 7 39.8
20	121 37.1	1 5.9	299 5.2	96 1.5	− 9 15.3	100 8.6	− 7 41.1
22	151 37.6	1 3.9	329 10.1	126 .7	− 9 17.7	130 10.5	− 7 42.4
Δ	2	−10		−4	−12	9	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	318 39.0	72	20 52.0	111	74 25.1	−23 8.7	192 33.1	7 56.3
2	347 31.3	70	21 14.1	108	104 29.8	−23 8.7	222 37.4	7 56.0
4	16 23.3	68	21 35.7	105	134 34.5	−23 8.7	252 41.7	7 55.8
6	45 14.8	66	21 56.8	103	164 39.3	−23 8.6	282 46.1	7 55.6
8	74 6.0	64	22 17.3	100	194 44.0	−23 8.6	312 50.4	7 55.3
10	102 56.9	62	22 37.3	97	224 48.8	−23 8.6	342 54.8	7 55.1
12	131 47.3	61	22 56.7	94	254 53.5	−23 8.6	12 59.1	7 54.9
14	160 37.4	59	23 15.5	91	284 58.2	−23 8.6	43 3.5	7 54.6
16	189 27.2	57	23 33.8	88	315 3.0	−23 8.6	73 7.8	7 54.4
18	218 16.6	55	23 51.4	85	345 7.7	−23 8.6	103 12.2	7 54.2
20	247 5.7	54	24 8.4	82	15 12.4	−23 8.6	133 16.5	7 53.9
22	275 54.4	52	24 24.8	79	45 17.1	−23 8.5	163 20.9	7 53.7
Δ					24	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 38	18 8	0 42	2 28	18 9	.8	12 21	4.4
55	5 40	18 6	0 36	2 6	18 52	1.4	11 39	3.8
50	5 42	18 4	0 32	1 50	19 23	1.7	11 10	3.4
45	5 44	18 3	0 29	1 39	19 46	1.9	10 48	3.3
40	5 45	18 2	0 27	1 31	20 4	2.0	10 31	3.1
35	5 46	18 1	0 25	1 25	20 20	2.1	10 16	3.0
30	5 47	18 0	0 24	1 20	20 34	2.2	10 3	2.9
20	5 48	17 59	0 22	1 13	20 57	2.3	9 42	2.7
10	5 49	17 58	0 21	1 10	21 17	2.4	9 23	2.6
0	5 50	17 57	0 21	1 9	21 36	2.5	9 5	2.5
10	5 51	17 56	0 21	1 10	21 55	2.6	8 48	2.3
20	5 52	17 55	0 22	1 13	22 16	2.7	8 30	2.2
30	5 53	17 55	0 24	1 20	22 40	2.9	8 8	2.0
35	5 53	17 54	0 25	1 24	22 54	2.9	7 56	1.9
40	5 54	17 54	0 27	1 31	23 10	3.0	7 42	1.8
45	5 54	17 54	0 29	1 39	23 30	3.1	7 25	1.7
50	5 55	17 53	0 32	1 49	23 55	3.3	7 4	1.4
55	5 55	17 53	0 36	2 4	. . .	.0	6 38	1.1
60	5 56	17 52	0 42	2 24	. . .	.0	6 1	.5
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	6 10.8	.9	15.9	$T_{\overline{m}}$	2 52	2.4	59.4	16.2
12	6 21.5	$T_{\overline{m}_\odot}$	11 h 53.6 min	Starost 19.2 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 36	.1	158	−3.8	♃	18 59	.0	76	−2.2
♂	13 20	.1	162	1.7	♄	11 8	.0	194	1.1

20. SEPTEMBAR SUBOTA

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 38.0	1 2.0	359 15.0	155 60.0	− 9 20.2	160 12.3	− 7 43.7
2	211 38.4	1 .0	29 20.0	185 59.2	− 9 22.6	190 14.2	− 7 44.9
4	241 38.9	0 58.1	59 24.9	215 58.5	− 9 25.0	220 16.0	− 7 46.2
6	271 39.3	0 56.1	89 29.8	245 57.7	− 9 27.5	250 17.9	− 7 47.5
8	301 39.8	0 54.2	119 34.7	275 57.0	− 9 29.9	280 19.7	− 7 48.8
10	331 40.2	0 52.3	149 39.7	305 56.2	− 9 32.4	310 21.6	− 7 50.1
12	1 40.7	0 50.3	179 44.6	335 55.5	− 9 34.8	340 23.4	− 7 51.4
14	31 41.1	0 48.4	209 49.5	5 54.7	− 9 37.2	10 25.3	− 7 52.7
16	61 41.6	0 46.4	239 54.5	35 53.9	− 9 39.7	40 27.1	− 7 54.0
18	91 42.0	0 44.5	269 59.4	65 53.2	− 9 42.1	70 28.9	− 7 55.3
20	121 42.4	0 42.5	300 4.3	95 52.4	− 9 44.5	100 30.8	− 7 56.6
22	151 42.9	0 40.6	330 9.2	125 51.7	− 9 46.9	130 32.6	− 7 57.9
Δ	2	−10		−4	−12	9	−6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	304 42.8	51	24 40.5	76	75 21.9	−23 8.5	193 25.2	7 53.5
2	333 30.9	49	24 55.6	72	105 26.6	−23 8.5	223 29.6	7 53.3
4	2 18.7	48	25 10.1	69	135 31.3	−23 8.5	253 33.9	7 53.0
6	31 6.3	46	25 23.8	65	165 36.0	−23 8.5	283 38.3	7 52.8
8	59 53.5	45	25 36.9	62	195 40.8	−23 8.5	313 42.6	7 52.6
10	88 40.5	44	25 49.3	59	225 45.5	−23 8.5	343 47.0	7 52.3
12	117 27.2	43	26 1.0	55	255 50.2	−23 8.5	13 51.3	7 52.1
14	146 13.7	41	26 12.0	51	285 54.9	−23 8.4	43 55.7	7 51.9
16	175 .0	40	26 22.3	48	315 59.6	−23 8.4	74 .0	7 51.6
18	203 46.1	39	26 31.8	44	346 4.3	−23 8.4	104 4.4	7 51.4
20	232 32.0	39	26 40.7	41	16 9.0	−23 8.4	134 8.7	7 51.2
22	261 17.7	38	26 48.8	37	46 13.8	−23 8.4	164 13.1	7 50.9
Δ					24	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 40	18 5	0 42	2 27	18 29	1.9	14 7	3.6
55	5 42	18 3	0 36	2 5	19 27	2.2	13 9	3.2
50	5 44	18 2	0 32	1 50	20 4	2.3	12 33	3.0
45	5 45	18 1	0 29	1 39	20 31	2.4	12 6	2.9
40	5 46	18 0	0 27	1 31	20 53	2.5	11 45	2.9
35	5 47	17 59	0 25	1 25	21 11	2.5	11 28	2.8
30	5 47	17 59	0 24	1 20	21 27	2.5	11 13	2.8
20	5 48	17 58	0 22	1 13	21 53	2.6	10 47	2.7
10	5 49	17 57	0 21	1 10	22 16	2.6	10 25	2.6
0	5 50	17 57	0 21	1 9	22 37	2.6	10 5	2.6
10	5 51	17 56	0 21	1 10	22 58	2.6	9 44	2.5
20	5 51	17 56	0 22	1 13	23 21	2.6	9 23	2.5
30	5 52	17 55	0 24	1 20	23 48	2.7	8 57	2.4
35	5 52	17 55	0 25	1 24	. . .	.0	8 43	2.3
40	5 52	17 55	0 27	1 31	. . .	.0	8 25	2.2
45	5 52	17 55	0 29	1 39	. . .	.0	8 5	2.1
50	5 53	17 55	0 32	1 49	. . .	.0	7 39	2.0
55	5 53	17 55	0 36	2 4	0 29	3.5	7 5	1.8
60	5 53	17 55	0 42	2 25	1 20	4.1	6 12	1.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	6 32.2	.9	16.0	$T_{\overline{m}}$	3 50	2.6	59.4	16.2
12	6 42.9	$T_{\overline{m}_\odot}$	11 h 53.3 min	Starost 20.2 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 36	.1	157	−3.8	♃	18 56	.0	76	−2.2
♂	13 18	.1	161	1.7	♄	11 5	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 43.3	0 38.7	0 14.2	155 50.9	- 9 49.4	160 34.5	- 7 59.2
2	211 43.8	0 36.7	30 19.1	185 50.1	- 9 51.8	190 36.3	- 8 .4
4	241 44.2	0 34.8	60 24.0	215 49.4	- 9 54.2	220 38.1	- 8 1.7
6	271 44.7	0 32.8	90 29.0	245 48.6	- 9 56.6	250 40.0	- 8 3.0
8	301 45.1	0 30.9	120 33.9	275 47.8	- 9 59.1	280 41.8	- 8 4.3
10	331 45.5	0 28.9	150 38.8	305 47.0	-10 1.5	310 43.7	- 8 5.6
12	1 46.0	0 27.0	180 43.7	335 46.3	-10 3.9	340 45.5	- 8 6.9
14	31 46.4	0 25.1	210 48.7	5 45.5	-10 6.3	10 47.3	- 8 8.2
16	61 46.9	0 23.1	240 53.6	35 44.7	-10 8.7	40 49.2	- 8 9.5
18	91 47.3	0 21.2	270 58.5	65 43.9	-10 11.1	70 51.0	- 8 10.8
20	121 47.7	0 19.2	301 3.5	95 43.2	-10 13.5	100 52.8	- 8 12.0
22	151 48.2	0 17.3	331 8.4	125 42.4	-10 16.0	130 54.7	- 8 13.3
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 3.2	37	26 56.1	33	76 18.5	-23 8.4	194 17.4	7 50.7
2	318 48.7	36	27 2.7	29	106 23.2	-23 8.4	224 21.8	7 50.5
4	347 34.0	36	27 8.6	26	136 27.9	-23 8.3	254 26.1	7 50.2
6	16 19.2	36	27 13.7	22	166 32.6	-23 8.3	284 30.5	7 50.0
8	45 4.3	35	27 18.1	18	196 37.3	-23 8.3	314 34.8	7 49.8
10	73 49.3	35	27 21.7	14	226 42.0	-23 8.3	344 39.2	7 49.6
12	102 34.3	35	27 24.5	10	256 46.7	-23 8.3	14 43.5	7 49.3
14	131 19.3	35	27 26.6	7	286 51.4	-23 8.3	44 47.9	7 49.1
16	160 4.3	35	27 27.9	3	316 56.1	-23 8.3	74 52.2	7 48.9
18	188 49.3	35	27 28.5	-1	347 .8	-23 8.2	104 56.6	7 48.6
20	217 34.3	35	27 28.3	-5	17 5.5	-23 8.2	135 .9	7 48.4
22	246 19.4	36	27 27.3	-9	47 10.2	-23 8.2	165 5.3	7 48.2
Δ					24	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 43	18 2	0 42	2 26	19 14	3.4	15 32	2.0
55	5 44	18 1	0 36	2 5	20 21	3.1	14 26	2.3
50	5 45	17 60	0 32	1 50	21 0	3.0	13 46	2.4
45	5 46	17 59	0 29	1 39	21 29	2.9	13 17	2.4
40	5 47	17 58	0 27	1 31	21 52	2.8	12 54	2.5
35	5 47	17 58	0 25	1 25	22 11	2.8	12 35	2.5
30	5 48	17 58	0 24	1 20	22 27	2.7	12 19	2.5
20	5 49	17 57	0 22	1 13	22 54	2.7	11 52	2.6
10	5 49	17 56	0 21	1 10	23 18	2.6	11 29	2.6
0	5 50	17 56	0 21	1 9	23 40	2.6	11 7	2.6
10	5 50	17 56	0 21	1 10	. . .	.0	10 45	2.6
20	5 50	17 56	0 22	1 13	. . .	.0	10 21	2.6
30	5 50	17 56	0 24	1 20	. . .	.0	9 54	2.6
35	5 50	17 56	0 25	1 25	0 4	2.7	9 38	2.6
40	5 51	17 56	0 27	1 31	0 23	2.7	9 19	2.7
45	5 51	17 56	0 29	1 39	0 45	2.7	8 56	2.7
50	5 50	17 56	0 32	1 50	1 14	2.7	8 28	2.7
55	5 50	17 57	0 36	2 4	1 53	2.8	7 48	2.7
60	5 50	17 57	0 42	2 26	2 60	2.8	6 41	2.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	6 53.5	.9	16.0	$T_{\overline{m}}$ 4 52	2.6	59.4	16.2
12	7 4.1	$T_{\overline{m}_\odot}$ 11 h 52.9 min		Starost 21.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 37	.1	156	-3.8	♄	18 52	.0	76	-2.2
♂	13 17	.1	160	1.7	♇	11 1	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 48.6	0 15.3	1 13.3	155 41.6	-10 18.4	160 56.5	- 8 14.6
2	211 49.1	0 13.4	31 18.2	185 40.8	-10 20.8	190 58.3	- 8 15.9
4	241 49.5	0 11.4	61 23.2	215 40.0	-10 23.2	221 .2	- 8 17.2
6	271 50.0	0 9.5	91 28.1	245 39.3	-10 25.6	251 2.0	- 8 18.5
8	301 50.4	0 7.5	121 33.0	275 38.5	-10 28.0	281 3.8	- 8 19.8
10	331 50.8	0 5.6	151 37.9	305 37.7	-10 30.4	311 5.7	- 8 21.0
12	1 51.3	0 3.6	181 42.9	335 36.9	-10 32.8	341 7.5	- 8 22.3
14	31 51.7	0 1.7	211 47.8	5 36.1	-10 35.2	11 9.3	- 8 23.6
16	61 52.1	- 0 .2	241 52.7	35 35.3	-10 37.6	41 11.1	- 8 24.9
18	91 52.6	- 0 2.2	271 57.7	65 34.5	-10 40.0	71 13.0	- 8 26.2
20	121 53.0	- 0 4.1	302 2.6	95 33.7	-10 42.4	101 14.8	- 8 27.5
22	151 53.5	- 0 6.1	332 7.5	125 32.9	-10 44.7	131 16.6	- 8 28.8
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	275 4.5	36	27 25.6	-12	77 14.9	-23 8.2	195 9.6	7 47.9
2	303 49.7	37	27 23.1	-16	107 19.6	-23 8.2	225 14.0	7 47.7
4	332 35.1	37	27 19.9	-20	137 24.2	-23 8.2	255 18.3	7 47.5
6	1 20.5	38	27 15.9	-24	167 28.9	-23 8.1	285 22.7	7 47.3
8	30 6.2	39	27 11.2	-27	197 33.6	-23 8.1	315 27.0	7 47.0
10	58 52.0	40	27 5.7	-31	227 38.3	-23 8.1	345 31.4	7 46.8
12	87 37.9	41	26 59.5	-35	257 43.0	-23 8.1	15 35.8	7 46.6
14	116 24.1	42	26 52.6	-38	287 47.7	-23 8.1	45 40.1	7 46.3
16	145 10.5	43	26 44.9	-42	317 52.4	-23 8.1	75 44.5	7 46.1
18	173 57.1	44	26 36.6	-45	347 57.0	-23 8.0	105 48.8	7 45.9
20	202 43.9	46	26 27.5	-49	18 1.7	-23 8.0	135 53.2	7 45.6
22	231 31.0	47	26 17.8	-52	48 6.4	-23 8.0	165 57.5	7 45.4
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 45	17 59	0 41	2 26	20 36	4.3	16 20	.9
55	5 46	17 58	0 36	2 4	21 35	3.6	15 21	1.5
50	5 47	17 58	0 32	1 50	22 11	3.3	14 43	1.7
45	5 47	17 57	0 29	1 39	22 38	3.2	14 16	1.9
40	5 48	17 57	0 27	1 31	22 60	3.0	13 54	2.0
35	5 48	17 56	0 25	1 24	23 17	2.9	13 36	2.1
30	5 48	17 56	0 24	1 20	23 33	2.8	13 20	2.2
20	5 49	17 56	0 22	1 13	23 58	2.7	12 54	2.3
10	5 49	17 56	0 21	1 10	. . .	.0	12 31	2.4
0	5 49	17 56	0 21	1 9	. . .	.0	12 9	2.5
10	5 49	17 56	0 21	1 10	0 1	2.5	11 48	2.6
20	5 49	17 56	0 22	1 13	0 25	2.4	11 24	2.7
30	5 49	17 56	0 24	1 20	0 52	2.4	10 58	2.8
35	5 49	17 57	0 25	1 25	1 9	2.3	10 42	2.9
40	5 49	17 57	0 27	1 31	1 27	2.3	10 23	3.0
45	5 49	17 57	0 29	1 39	1 50	2.2	10 0	3.1
50	5 48	17 58	0 32	1 50	2 19	2.1	9 32	3.2
55	5 48	17 59	0 36	2 5	2 60	1.8	8 52	3.4
60	5 47	17 59	0 42	2 26	4 7	1.3	7 44	4.0
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	7 14.7	.9	16.0	$T_{\overline{m}}$ 5 54	2.5	59.3	16.1
12	7 25.3	$T_{\overline{m}_\odot}$ 11 h 52.6 min		Starost 22.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 38	.1	154	-3.8	♄	18 48	.0	76	-2.2
♂	13 15	.1	160	1.7	♇	10 58	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 53.9	- 0 8.0	2 12.4	155 32.1	-10 47.1	161 18.4	- 8 30.0
2	211 54.3	- 0 10.0	32 17.4	185 31.3	-10 49.5	191 20.3	- 8 31.3
4	241 54.8	- 0 11.9	62 22.3	215 30.5	-10 51.9	221 22.1	- 8 32.6
6	271 55.2	- 0 13.9	92 27.2	245 29.7	-10 54.3	251 23.9	- 8 33.9
8	301 55.7	- 0 15.8	122 32.2	275 28.9	-10 56.7	281 25.7	- 8 35.2
10	331 56.1	- 0 17.8	152 37.1	305 28.1	-10 59.1	311 27.6	- 8 36.5
12	1 56.5	- 0 19.7	182 42.0	335 27.3	-11 1.4	341 29.4	- 8 37.7
14	31 57.0	- 0 21.7	212 46.9	5 26.5	-11 3.8	11 31.2	- 8 39.0
16	61 57.4	- 0 23.6	242 51.9	35 25.7	-11 6.2	41 33.0	- 8 40.3
18	91 57.8	- 0 25.6	272 56.8	65 24.9	-11 8.6	71 34.8	- 8 41.6
20	121 58.3	- 0 27.5	303 1.7	95 24.1	-11 10.9	101 36.6	- 8 42.9
22	151 58.7	- 0 29.5	333 6.7	125 23.3	-11 13.3	131 38.5	- 8 44.1
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	260 18.4	48	26 7.3	-56	78 11.1	-23 8.0	196 1.9	7 45.2
2	289 6.1	50	25 56.2	-59	108 15.7	-23 8.0	226 6.2	7 45.0
4	317 54.1	51	25 44.4	-62	138 20.4	-23 8.0	256 10.6	7 44.7
6	346 42.4	53	25 31.9	-66	168 25.1	-23 7.9	286 14.9	7 44.5
8	15 31.0	55	25 18.8	-69	198 29.8	-23 7.9	316 19.3	7 44.3
10	44 19.9	56	25 5.0	-72	228 34.4	-23 7.9	346 23.6	7 44.0
12	73 9.2	58	24 50.6	-75	258 39.1	-23 7.9	16 28.0	7 43.8
14	101 58.9	60	24 35.6	-78	288 43.8	-23 7.9	46 32.3	7 43.6
16	130 48.9	62	24 20.0	-81	318 48.4	-23 7.8	76 36.7	7 43.4
18	159 39.2	64	24 3.7	-84	348 53.1	-23 7.8	106 41.1	7 43.1
20	188 30.0	66	23 46.9	-87	18 57.7	-23 7.8	136 45.4	7 42.9
22	217 21.1	68	23 29.5	-90	49 2.4	-23 7.8	166 49.8	7 42.7
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 47	17 56	0 41	2 25	22 18	4.4	16 41	.4
55	5 48	17 56	0 36	2 4	23 2	3.8	15 56	.9
50	5 48	17 55	0 32	1 49	23 32	3.5	15 25	1.3
45	5 49	17 55	0 29	1 39	23 54	3.2	15 2	1.5
40	5 49	17 55	0 27	1 31	. . . .	.0	14 43	1.6
35	5 49	17 55	0 25	1 24	. . . .	.0	14 27	1.8
30	5 49	17 55	0 24	1 20	. . . .	.0	14 13	1.9
20	5 49	17 55	0 22	1 13	. . . .	.0	13 49	2.1
10	5 49	17 55	0 21	1 10	0 20	2.6	13 29	2.2
0	5 49	17 55	0 21	1 9	0 41	2.4	13 9	2.4
10	5 49	17 56	0 21	1 10	1 2	2.3	12 50	2.5
20	5 48	17 56	0 22	1 13	1 24	2.2	12 29	2.6
30	5 48	17 57	0 24	1 20	1 49	2.0	12 5	2.8
35	5 48	17 57	0 25	1 25	2 4	1.9	11 50	2.9
40	5 47	17 58	0 27	1 31	2 22	1.8	11 34	3.1
45	5 47	17 59	0 29	1 39	2 42	1.7	11 14	3.2
50	5 46	17 59	0 32	1 50	3 9	1.5	10 48	3.5
55	5 45	18 0	0 36	2 5	3 44	1.2	10 14	3.8
60	5 44	18 2	0 42	2 27	4 38	.5	9 21	4.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	7 35.8	.9	16.0	$T_{\overline{m}}$ 6 55	2.4	59.1	16.1
12	7 46.3	$T_{\overline{m}_\odot}$ 11 h 52.2 min		Starost 23.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 38	.1	153	-3.8	♃	18 44	.0	76	-2.2
♂	13 14	.1	159	1.7	♄	10 54	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 59.1	- 0 31.4	3 11.6	155 22.5	-11 15.7	161 40.3	- 8 45.4
2	211 59.6	- 0 33.4	33 16.5	185 21.7	-11 18.0	191 42.1	- 8 46.7
4	242 .0	- 0 35.3	63 21.4	215 20.8	-11 20.4	221 43.9	- 8 48.0
6	272 .4	- 0 37.2	93 26.4	245 20.0	-11 22.8	251 45.7	- 8 49.3
8	302 .9	- 0 39.2	123 31.3	275 19.2	-11 25.1	281 47.5	- 8 50.5
10	332 1.3	- 0 41.1	153 36.2	305 18.4	-11 27.5	311 49.3	- 8 51.8
12	2 1.7	- 0 43.1	183 41.2	335 17.6	-11 29.9	341 51.2	- 8 53.1
14	32 2.2	- 0 45.0	213 46.1	5 16.7	-11 32.2	11 53.0	- 8 54.4
16	62 2.6	- 0 47.0	243 51.0	35 15.9	-11 34.6	41 54.8	- 8 55.7
18	92 3.0	- 0 48.9	273 55.9	65 15.1	-11 36.9	71 56.6	- 8 56.9
20	122 3.5	- 0 50.9	304 .9	95 14.3	-11 39.3	101 58.4	- 8 58.2
22	152 3.9	- 0 52.8	334 5.8	125 13.4	-11 41.6	132 .2	- 8 59.5
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	246 12.6	69	23 11.6	-92	79 7.1	-23 7.8	196 54.1	7 42.4
2	275 4.5	71	22 53.1	-95	109 11.7	-23 7.7	226 58.5	7 42.2
4	303 56.8	73	22 34.0	-98	139 16.4	-23 7.7	257 2.8	7 42.0
6	332 49.5	75	22 14.5	-100	169 21.0	-23 7.7	287 7.2	7 41.8
8	1 42.6	77	21 54.4	-103	199 25.7	-23 7.7	317 11.5	7 41.5
10	30 36.0	79	21 33.8	-105	229 30.3	-23 7.7	347 15.9	7 41.3
12	59 29.9	81	21 12.8	-108	259 35.0	-23 7.7	17 20.3	7 41.1
14	88 24.2	83	20 51.2	-110	289 39.6	-23 7.6	47 24.6	7 40.8
16	117 18.8	85	20 29.2	-112	319 44.3	-23 7.6	77 29.0	7 40.6
18	146 13.9	87	20 6.8	-114	349 48.9	-23 7.6	107 33.3	7 40.4
20	175 9.4	89	19 43.9	-117	19 53.6	-23 7.6	137 37.7	7 40.2
22	204 5.2	91	19 20.6	-119	49 58.2	-23 7.5	167 42.0	7 39.9
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 50	17 53	0 41	2 24	. . . .	.0	16 50	.2
55	5 50	17 53	0 36	2 4	. . . .	.0	16 19	.6
50	5 50	17 53	0 32	1 49	. . . .	.0	15 55	.9
45	5 50	17 53	0 29	1 38	. . . .	.0	15 37	1.2
40	5 50	17 53	0 27	1 30	0 12	3.1	15 22	1.3
35	5 50	17 54	0 25	1 24	0 27	2.9	15 9	1.5
30	5 50	17 54	0 24	1 20	0 40	2.8	14 58	1.6
20	5 49	17 54	0 22	1 13	1 3	2.6	14 39	1.8
10	5 49	17 55	0 21	1 10	1 22	2.4	14 22	2.0
0	5 49	17 55	0 21	1 9	1 40	2.3	14 6	2.2
10	5 48	17 56	0 21	1 10	1 57	2.1	13 50	2.4
20	5 48	17 57	0 22	1 13	2 16	1.9	13 33	2.5
30	5 47	17 58	0 24	1 20	2 38	1.7	13 13	2.8
35	5 46	17 58	0 25	1 25	2 51	1.6	13 1	2.9
40	5 46	17 59	0 27	1 31	3 5	1.5	12 47	3.0
45	5 45	17 60	0 29	1 39	3 23	1.3	12 31	3.2
50	5 44	18 1	0 32	1 50	3 44	1.1	12 11	3.5
55	5 43	18 2	0 36	2 6	4 12	.8	11 45	3.8
60	5 41	18 4	0 42	2 28	4 51	.2	11 8	4.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	7 56.7	.9	16.0	$T_{\overline{m}}$ 7 53	2.2	58.8	16.0
12	8 7.1	$T_{\overline{m}_\odot}$ 11 h 51.9 min		Starost 24.2 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 39	.1	152	-3.8	♃	18 41	.0	76	-2.2
♂	13 13	.1	158	1.7	♄	10 51	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 4.3	- 0 54.8	4 10.7	155 12.6	-11 44.0	162 2.0	- 9 .8
2	212 4.8	- 0 56.7	34 15.7	185 11.8	-11 46.3	192 3.8	- 9 2.0
4	242 5.2	- 0 58.7	64 20.6	215 10.9	-11 48.7	222 5.6	- 9 3.3
6	272 5.6	- 1 .6	94 25.5	245 10.1	-11 51.0	252 7.4	- 9 4.6
8	302 6.1	- 1 2.6	124 30.4	275 9.3	-11 53.3	282 9.2	- 9 5.9
10	332 6.5	- 1 4.5	154 35.4	305 8.4	-11 55.7	312 11.0	- 9 7.1
12	2 6.9	- 1 6.5	184 40.3	335 7.6	-11 58.0	342 12.8	- 9 8.4
14	32 7.3	- 1 8.4	214 45.2	5 6.7	-12 .4	12 14.6	- 9 9.7
16	62 7.8	- 1 10.4	244 50.1	35 5.9	-12 2.7	42 16.4	- 9 11.0
18	92 8.2	- 1 12.3	274 55.1	65 5.0	-12 5.0	72 18.2	- 9 12.2
20	122 8.6	- 1 14.3	305 .0	95 4.2	-12 7.3	102 20.0	- 9 13.5
22	152 9.1	- 1 16.2	335 4.9	125 3.4	-12 9.7	132 21.8	- 9 14.8
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 1.5	93	18 56.9	-121	80 2.9	-23 7.5	197 46.4	7 39.7
2	261 58.1	95	18 32.7	-122	110 7.5	-23 7.5	227 50.7	7 39.5
4	290 55.2	97	18 8.2	-124	140 12.1	-23 7.5	257 55.1	7 39.2
6	319 52.6	99	17 43.4	-126	170 16.8	-23 7.5	287 59.5	7 39.0
8	348 50.3	101	17 18.2	-128	200 21.4	-23 7.4	318 3.8	7 38.8
10	17 48.5	103	16 52.6	-130	230 26.1	-23 7.4	348 8.2	7 38.6
12	46 47.0	104	16 26.7	-131	260 30.7	-23 7.4	18 12.5	7 38.3
14	75 45.9	106	16 .5	-133	290 35.3	-23 7.4	48 16.9	7 38.1
16	104 45.1	108	15 33.9	-134	320 40.0	-23 7.4	78 21.2	7 37.9
18	133 44.7	110	15 7.1	-136	350 44.6	-23 7.3	108 25.6	7 37.6
20	162 44.6	111	14 40.0	-137	20 49.2	-23 7.3	138 30.0	7 37.4
22	191 44.9	113	14 12.6	-138	50 53.8	-23 7.3	168 34.3	7 37.2
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 52	17 50	0 41	2 24	0 4	4.2	16 55	.1
55	5 52	17 50	0 36	2 3	0 34	3.7	16 34	.5
50	5 51	17 51	0 32	1 49	0 56	3.4	16 18	.7
45	5 51	17 51	0 29	1 38	1 12	3.2	16 5	1.0
40	5 51	17 52	0 27	1 30	1 26	3.0	15 54	1.1
35	5 50	17 52	0 25	1 24	1 38	2.8	15 45	1.3
30	5 50	17 53	0 24	1 20	1 48	2.7	15 37	1.4
20	5 50	17 53	0 22	1 13	2 5	2.5	15 23	1.6
10	5 49	17 54	0 21	1 10	2 20	2.3	15 10	1.8
0	5 48	17 55	0 21	1 9	2 34	2.1	14 58	2.0
10	5 48	17 56	0 21	1 10	2 48	1.9	14 46	2.2
20	5 47	17 57	0 22	1 13	3 3	1.7	14 34	2.4
30	5 45	17 58	0 24	1 20	3 20	1.5	14 19	2.6
35	5 45	17 59	0 25	1 25	3 29	1.4	14 10	2.8
40	5 44	17 60	0 27	1 31	3 41	1.2	14 0	2.9
45	5 43	18 1	0 29	1 40	3 54	1.0	13 49	3.1
50	5 42	18 2	0 32	1 51	4 10	.8	13 35	3.4
55	5 40	18 4	0 36	2 6	4 30	.5	13 16	3.7
60	5 38	18 6	0 42	2 29	4 57	.1	12 52	4.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	8 17.5	.9	16.0	$T_{\overline{m}}$ 8 46	2.1	58.4	15.9
12	8 27.8	$T_{\overline{m}_\odot}$ 11 h 51.5 min		Starost 25.2 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 40	.1	151	-3.8	♃	18 37	.0	76	-2.2
♂	13 11	.1	158	1.7	♄	10 47	.0	194	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 9.5	- 1 18.2	5 9.9	155 2.5	-12 12.0	162 23.6	- 9 16.1
2	212 9.9	- 1 20.1	35 14.8	185 1.7	-12 14.3	192 25.4	- 9 17.3
4	242 10.3	- 1 22.1	65 19.7	215 .8	-12 16.6	222 27.2	- 9 18.6
6	272 10.8	- 1 24.0	95 24.6	244 59.9	-12 19.0	252 29.0	- 9 19.9
8	302 11.2	- 1 25.9	125 29.6	274 59.1	-12 21.3	282 30.8	- 9 21.1
10	332 11.6	- 1 27.9	155 34.5	304 58.2	-12 23.6	312 32.6	- 9 22.4
12	2 12.0	- 1 29.8	185 39.4	334 57.4	-12 25.9	342 34.4	- 9 23.7
14	32 12.5	- 1 31.8	215 44.4	4 56.5	-12 28.2	12 36.2	- 9 25.0
16	62 12.9	- 1 33.7	245 49.3	34 55.7	-12 30.5	42 38.0	- 9 26.2
18	92 13.3	- 1 35.7	275 54.2	64 54.8	-12 32.8	72 39.8	- 9 27.5
20	122 13.7	- 1 37.6	305 59.1	94 53.9	-12 35.2	102 41.6	- 9 28.8
22	152 14.2	- 1 39.6	336 4.1	124 53.1	-12 37.5	132 43.4	- 9 30.0
Δ	2	-10		-4	-12	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	220 45.5	115	13 45.0	-139	80 58.5	-23 7.3	198 38.7	7 37.0
2	249 46.4	116	13 17.1	-141	111 3.1	-23 7.2	228 43.0	7 36.7
4	278 47.6	118	12 49.0	-142	141 7.7	-23 7.2	258 47.4	7 36.5
6	307 49.1	119	12 20.6	-143	171 12.3	-23 7.2	288 51.8	7 36.3
8	336 51.0	121	11 52.1	-144	201 17.0	-23 7.2	318 56.1	7 36.1
10	5 53.1	122	11 23.3	-145	231 21.6	-23 7.2	349 .5	7 35.8
12	34 55.5	123	10 54.4	-146	261 26.2	-23 7.1	19 4.8	7 35.6
14	63 58.2	125	10 25.3	-146	291 30.8	-23 7.1	49 9.2	7 35.4
16	93 1.1	126	9 56.0	-147	321 35.4	-23 7.1	79 13.6	7 35.2
18	122 4.3	127	9 26.5	-148	351 40.0	-23 7.1	109 17.9	7 34.9
20	151 7.7	128	8 57.0	-149	21 44.7	-23 7.0	139 22.3	7 34.7
22	180 11.4	130	8 27.3	-149	51 49.3	-23 7.0	169 26.6	7 34.5
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 54	17 47	0 41	2 23	1 45	4.0	16 57	.1
55	5 53	17 48	0 36	2 3	2 4	3.6	16 45	.4
50	5 53	17 49	0 32	1 49	2 18	3.3	16 35	.6
45	5 52	17 49	0 29	1 38	2 29	3.1	16 28	.8
40	5 52	17 50	0 27	1 30	2 38	2.9	16 21	1.0
35	5 51	17 51	0 25	1 24	2 46	2.7	16 16	1.2
30	5 51	17 51	0 24	1 19	2 52	2.6	16 11	1.3
20	5 50	17 52	0 22	1 13	3 4	2.4	16 2	1.5
10	5 49	17 53	0 21	1 10	3 15	2.2	15 54	1.7
0	5 48	17 54	0 21	1 9	3 24	2.0	15 47	1.9
10	5 47	17 56	0 21	1 10	3 34	1.8	15 40	2.1
20	5 46	17 57	0 22	1 13	3 44	1.6	15 32	2.3
30	5 44	17 59	0 24	1 20	3 56	1.3	15 22	2.5
35	5 43	17 60	0 25	1 25	4 2	1.2	15 17	2.7
40	5 42	18 1	0 27	1 31	4 10	1.1	15 11	2.8
45	5 41	18 2	0 29	1 40	4 19	.9	15 4	3.0
50	5 39	18 4	0 32	1 51	4 29	.7	14 55	3.2
55	5 37	18 6	0 36	2 7	4 42	.4	14 45	3.5
60	5 35	18 9	0 42	2 30	4 59	.1	14 30	3.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	8 38.1	.9	16.0	$T_{\overline{m}}$ 9 36	1.9	58.0	15.8
12	8 48.3	$T_{\overline{m}_\odot}$ 11 h 51.2 min		Starost 26.2 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 40	.1	150	-3.8	♃	18 33	.0	76	-2.2
♂	13 10	.1	157	1.7	♄	10 44	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 14.6	- 1 41.5	6 9.0	154 52.2	-12 39.8	162 45.1	- 9 31.3
2	212 15.0	- 1 43.5	36 13.9	184 51.3	-12 42.1	192 46.9	- 9 32.6
4	242 15.4	- 1 45.4	66 18.9	214 50.5	-12 44.4	222 48.7	- 9 33.8
6	272 15.8	- 1 47.4	96 23.8	244 49.6	-12 46.7	252 50.5	- 9 35.1
8	302 16.3	- 1 49.3	126 28.7	274 48.7	-12 49.0	282 52.3	- 9 36.4
10	332 16.7	- 1 51.3	156 33.6	304 47.8	-12 51.2	312 54.1	- 9 37.6
12	2 17.1	- 1 53.2	186 38.6	334 47.0	-12 53.5	342 55.9	- 9 38.9
14	32 17.5	- 1 55.2	216 43.5	4 46.1	-12 55.8	12 57.7	- 9 40.2
16	62 18.0	- 1 57.1	246 48.4	34 45.2	-12 58.1	42 59.4	- 9 41.4
18	92 18.4	- 1 59.1	276 53.4	64 44.3	-13 .4	73 1.2	- 9 42.7
20	122 18.8	- 2 1.0	306 58.3	94 43.4	-13 2.7	103 3.0	- 9 44.0
22	152 19.2	- 2 2.9	337 3.2	124 42.5	-13 5.0	133 4.8	- 9 45.2
Δ	2	-10		-4	-11	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	209 15.3	131	7 57.4	-150	81 53.9	-23 7.0	199 31.0	7 34.2
2	238 19.5	132	7 27.5	-150	111 58.5	-23 7.0	229 35.4	7 34.0
4	267 23.8	133	6 57.5	-151	142 3.1	-23 6.9	259 39.7	7 33.8
6	296 28.4	134	6 27.3	-151	172 7.7	-23 6.9	289 44.1	7 33.6
8	325 33.2	135	5 57.1	-151	202 12.3	-23 6.9	319 48.4	7 33.3
10	354 38.1	136	5 26.9	-152	232 16.9	-23 6.9	349 52.8	7 33.1
12	23 43.2	136	4 56.5	-152	262 21.5	-23 6.8	19 57.2	7 32.9
14	52 48.5	137	4 26.2	-152	292 26.1	-23 6.8	50 1.5	7 32.7
16	81 54.0	138	3 55.7	-152	322 30.7	-23 6.8	80 5.9	7 32.4
18	110 59.6	139	3 25.3	-152	352 35.3	-23 6.8	110 10.2	7 32.2
20	140 5.4	139	2 54.8	-152	22 39.9	-23 6.7	140 14.6	7 32.0
22	169 11.2	140	2 24.4	-152	52 44.5	-23 6.7	170 19.0	7 31.8
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 57	17 44	0 41	2 23	3 21	3.8	16 58	.0
55	5 55	17 45	0 36	2 3	3 30	3.5	16 54	.3
50	5 54	17 47	0 32	1 48	3 37	3.2	16 51	.6
45	5 53	17 48	0 29	1 38	3 42	3.0	16 48	.8
40	5 53	17 48	0 27	1 30	3 47	2.8	16 46	1.0
35	5 52	17 49	0 25	1 24	3 51	2.6	16 44	1.1
30	5 51	17 50	0 24	1 19	3 55	2.5	16 42	1.2
20	5 50	17 51	0 22	1 13	4 1	2.3	16 38	1.5
10	5 49	17 53	0 21	1 10	4 6	2.1	16 36	1.7
0	5 48	17 54	0 21	1 9	4 11	1.9	16 33	1.8
10	5 46	17 56	0 21	1 10	4 16	1.7	16 30	2.0
20	5 45	17 57	0 22	1 13	4 22	1.5	16 27	2.2
30	5 43	17 59	0 24	1 20	4 28	1.3	16 24	2.5
35	5 42	18 0	0 25	1 25	4 31	1.1	16 22	2.6
40	5 41	18 2	0 27	1 32	4 35	1.0	16 19	2.8
45	5 39	18 3	0 29	1 40	4 40	.8	16 17	2.9
50	5 37	18 5	0 32	1 51	4 45	.6	16 13	3.2
55	5 35	18 8	0 37	2 7	4 52	.4	16 9	3.4
60	5 32	18 11	0 42	2 31	5 1	.0	16 4	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	8 58.5	.8	16.0	$T_{\overline{m}}$ 10 22	1.9	57.6	15.7
12	9 8.6	$T_{\overline{m}_\odot}$ 11 h 50.9 min		Starost 27.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 41	.1	149	-3.8	♃	18 30	.0	76	-2.2
♂	13 8	.1	157	1.6	♄	10 40	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 19.6	- 2 4.9	7 8.1	154 41.7	-13 7.2	163 6.6	- 9 46.5
2	212 20.0	- 2 6.8	37 13.1	184 40.8	-13 9.5	193 8.3	- 9 47.8
4	242 20.5	- 2 8.8	67 18.0	214 39.9	-13 11.8	223 10.1	- 9 49.0
6	272 20.9	- 2 10.7	97 22.9	244 39.0	-13 14.1	253 11.9	- 9 50.3
8	302 21.3	- 2 12.7	127 27.9	274 38.1	-13 16.3	283 13.7	- 9 51.6
10	332 21.7	- 2 14.6	157 32.8	304 37.2	-13 18.6	313 15.4	- 9 52.8
12	2 22.1	- 2 16.6	187 37.7	334 36.3	-13 20.9	343 17.2	- 9 54.1
14	32 22.5	- 2 18.5	217 42.6	4 35.4	-13 23.1	13 19.0	- 9 55.3
16	62 23.0	- 2 20.5	247 47.6	34 34.5	-13 25.4	43 20.8	- 9 56.6
18	92 23.4	- 2 22.4	277 52.5	64 33.6	-13 27.6	73 22.5	- 9 57.9
20	122 23.8	- 2 24.3	307 57.4	94 32.7	-13 29.9	103 24.3	- 9 59.1
22	152 24.2	- 2 26.3	338 2.4	124 31.8	-13 32.2	133 26.1	-10 .4
Δ	2	-10		-4	-11	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 17.3	141	1 53.9	-152	82 49.1	-23 6.7	200 23.3	7 31.5
2	227 23.4	141	1 23.5	-152	112 53.7	-23 6.7	230 27.7	7 31.3
4	256 29.6	142	0 53.0	-152	142 58.3	-23 6.6	260 32.1	7 31.1
6	285 36.0	142	0 22.6	-152	173 2.9	-23 6.6	290 36.4	7 30.9
8	314 42.4	143	- 0 7.7	-152	203 7.4	-23 6.6	320 40.8	7 30.6
10	343 48.9	143	- 0 38.1	-151	233 12.0	-23 6.6	350 45.1	7 30.4
12	12 55.5	143	- 1 8.3	-151	263 16.6	-23 6.5	20 49.5	7 30.2
14	42 2.2	144	- 1 38.5	-151	293 21.2	-23 6.5	50 53.9	7 30.0
16	71 8.9	144	- 2 8.6	-150	323 25.8	-23 6.5	80 58.2	7 29.7
18	100 15.7	144	- 2 38.7	-150	353 30.4	-23 6.5	111 2.6	7 29.5
20	129 22.5	144	- 3 8.6	-149	23 34.9	-23 6.4	141 7.0	7 29.3
22	158 29.3	144	- 3 38.4	-149	53 39.5	-23 6.4	171 11.3	7 29.1
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	5 59	17 41	0 41	2 22	4 52	3.7	16 59	.0
55	5 57	17 43	0 36	2 2	4 53	3.4	17 2	.4
50	5 56	17 44	0 32	1 48	4 53	3.1	17 5	.6
45	5 55	17 46	0 29	1 38	4 54	2.9	17 7	.8
40	5 54	17 47	0 27	1 30	4 54	2.7	17 9	1.0
35	5 53	17 48	0 25	1 24	4 54	2.6	17 10	1.1
30	5 52	17 49	0 24	1 19	4 55	2.4	17 11	1.2
20	5 50	17 51	0 22	1 13	4 55	2.2	17 13	1.4
10	5 49	17 52	0 21	1 10	4 56	2.0	17 15	1.6
0	5 47	17 54	0 21	1 9	4 56	1.8	17 17	1.8
10	5 46	17 56	0 21	1 10	4 57	1.6	17 19	2.0
20	5 44	17 57	0 22	1 14	4 57	1.4	17 21	2.2
30	5 42	17 60	0 24	1 20	4 58	1.2	17 23	2.4
35	5 40	18 1	0 25	1 25	4 58	1.1	17 24	2.6
40	5 39	18 3	0 27	1 32	4 59	.9	17 26	2.7
45	5 37	18 5	0 29	1 40	4 59	.8	17 27	2.9
50	5 35	18 7	0 33	1 52	4 60	.6	17 29	3.1
55	5 32	18 10	0 37	2 8	5 1	.3	17 31	3.4
60	5 29	18 14	0 42	2 32	5 2	.0	17 35	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 18.7	.8	16.0	$T_{\overline{m}}$ 11 7	1.8	57.1	15.6
12	9 28.7	$T_{\overline{m}_\odot}$ 11 h 50.5 min		Starost 28.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 42	.1	148	-3.8	♃	18 26	.0	76	-2.2
♂	13 7	.1	156	1.6	♄	10 37	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 24.6	- 2 28.2	8 7.3	154 30.9	-13 34.4	163 27.9	-10 1.7
2	212 25.0	- 2 30.2	38 12.2	184 30.0	-13 36.7	193 29.6	-10 2.9
4	242 25.4	- 2 32.1	68 17.1	214 29.1	-13 38.9	223 31.4	-10 4.2
6	272 25.9	- 2 34.1	98 22.1	244 28.1	-13 41.2	253 33.2	-10 5.4
8	302 26.3	- 2 36.0	128 27.0	274 27.2	-13 43.4	283 34.9	-10 6.7
10	332 26.7	- 2 38.0	158 31.9	304 26.3	-13 45.6	313 36.7	-10 7.9
12	2 27.1	- 2 39.9	188 36.8	334 25.4	-13 47.9	343 38.5	-10 9.2
14	32 27.5	- 2 41.8	218 41.8	4 24.5	-13 50.1	13 40.2	-10 10.5
16	62 27.9	- 2 43.8	248 46.7	34 23.6	-13 52.4	43 42.0	-10 11.7
18	92 28.3	- 2 45.7	278 51.6	64 22.6	-13 54.6	73 43.8	-10 13.0
20	122 28.7	- 2 47.7	308 56.6	94 21.7	-13 56.8	103 45.5	-10 14.2
22	152 29.1	- 2 49.6	339 1.5	124 20.8	-13 59.1	133 47.3	-10 15.5
Δ	2	-10		-5	-11	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	187 36.2	144	- 4 8.2	-148	83 44.1	-23 6.4	201 15.7	7 28.8
2	216 43.1	144	- 4 37.8	-147	113 48.7	-23 6.3	231 20.1	7 28.6
4	245 50.0	145	- 5 7.3	-147	143 53.2	-23 6.3	261 24.4	7 28.4
6	274 56.9	144	- 5 36.6	-146	173 57.8	-23 6.3	291 28.8	7 28.2
8	304 3.8	144	- 6 5.8	-145	204 2.4	-23 6.3	321 33.2	7 27.9
10	333 10.7	144	- 6 34.9	-144	234 7.0	-23 6.2	351 37.5	7 27.7
12	2 17.5	144	- 7 3.8	-144	264 11.5	-23 6.2	21 41.9	7 27.5
14	31 24.4	144	- 7 32.5	-143	294 16.1	-23 6.2	51 46.2	7 27.3
16	60 31.2	144	- 8 1.0	-142	324 20.7	-23 6.1	81 50.6	7 27.0
18	89 37.9	144	- 8 29.4	-141	354 25.2	-23 6.1	111 55.0	7 26.8
20	118 44.7	143	- 8 57.6	-140	24 29.8	-23 6.1	141 59.3	7 26.6
22	147 51.3	143	- 9 25.6	-139	54 34.4	-23 6.1	172 3.7	7 26.4
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 1	17 38	0 41	2 22	6 22	3.7	17 0	.1
55	5 59	17 40	0 36	2 2	6 14	3.4	17 11	.4
50	5 57	17 42	0 32	1 48	6 8	3.1	17 19	.6
45	5 56	17 44	0 29	1 38	6 4	2.9	17 26	.8
40	5 55	17 45	0 27	1 30	5 60	2.7	17 32	1.0
35	5 53	17 46	0 25	1 24	5 56	2.6	17 36	1.2
30	5 52	17 48	0 24	1 19	5 54	2.4	17 41	1.3
20	5 50	17 50	0 22	1 13	5 49	2.2	17 48	1.5
10	5 49	17 52	0 21	1 10	5 44	2.0	17 55	1.7
0	5 47	17 53	0 21	1 9	5 40	1.8	18 1	1.8
10	5 45	17 55	0 21	1 10	5 36	1.7	18 7	2.0
20	5 43	17 58	0 22	1 14	5 32	1.5	18 14	2.2
30	5 41	18 0	0 24	1 20	5 27	1.2	18 21	2.4
35	5 39	18 2	0 25	1 25	5 24	1.1	18 26	2.6
40	5 37	18 4	0 27	1 32	5 21	1.0	18 31	2.7
45	5 35	18 6	0 30	1 41	5 18	.8	18 37	2.9
50	5 33	18 9	0 33	1 52	5 14	.6	18 44	3.1
55	5 30	18 12	0 37	2 8	5 9	.4	18 52	3.4
60	5 26	18 16	0 42	2 33	5 2	.0	19 4	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 38.7	.8	16.0	$T_{\overline{m}}$ 11 51	1.8	56.6	15.4
12	9 48.5	$T_{\overline{m}_\odot}$ 11 h 50.2 min		Starost 29.2 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 42	.1	146	-3.8	♃	18 22	.0	76	-2.2
♂	13 5	.1	155	1.6	♄	10 33	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 29.5	- 2 51.6	9 6.4	154 19.8	-14 1.3	163 49.0	-10 16.7
2	212 29.9	- 2 53.5	39 11.3	184 18.9	-14 3.5	193 50.8	-10 18.0
4	242 30.4	- 2 55.4	69 16.3	214 18.0	-14 5.7	223 52.6	-10 19.3
6	272 30.8	- 2 57.4	99 21.2	244 17.1	-14 7.9	253 54.3	-10 20.5
8	302 31.2	- 2 59.3	129 26.1	274 16.1	-14 10.2	283 56.1	-10 21.8
10	332 31.6	- 3 1.3	159 31.1	304 15.2	-14 12.4	313 57.8	-10 23.0
12	2 32.0	- 3 3.2	189 36.0	334 14.2	-14 14.6	343 59.6	-10 24.3
14	32 32.4	- 3 5.1	219 40.9	4 13.3	-14 16.8	14 1.3	-10 25.5
16	62 32.8	- 3 7.1	249 45.8	34 12.4	-14 19.0	44 3.1	-10 26.8
18	92 33.2	- 3 9.0	279 50.8	64 11.4	-14 21.2	74 4.9	-10 28.0
20	122 33.6	- 3 11.0	309 55.7	94 10.5	-14 23.4	104 6.6	-10 29.3
22	152 34.0	- 3 12.9	340 .6	124 9.5	-14 25.6	134 8.4	-10 30.5
Δ	2	-10		-5	-11	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	176 57.9	143	- 9 53.3	-138	84 38.9	-23 6.0	202 8.1	7 26.2
2	206 4.4	142	-10 20.9	-137	114 43.5	-23 6.0	232 12.4	7 25.9
4	235 10.9	142	-10 48.2	-136	144 48.0	-23 6.0	262 16.8	7 25.7
6	264 17.3	141	-11 15.3	-134	174 52.6	-23 5.9	292 21.2	7 25.5
8	293 23.6	141	-11 42.2	-133	204 57.1	-23 5.9	322 25.5	7 25.3
10	322 29.8	140	-12 8.8	-132	235 1.7	-23 5.9	352 29.9	7 25.0
12	351 35.9	140	-12 35.2	-131	265 6.3	-23 5.9	22 34.3	7 24.8
14	20 41.9	139	-13 1.3	-129	295 10.8	-23 5.8	52 38.6	7 24.6
16	49 47.7	139	-13 27.1	-128	325 15.4	-23 5.8	82 43.0	7 24.4
18	78 53.5	138	-13 52.7	-126	355 19.9	-23 5.8	112 47.4	7 24.1
20	107 59.2	138	-14 18.0	-125	25 24.5	-23 5.7	142 51.8	7 23.9
22	137 4.7	137	-14 43.0	-124	55 29.0	-23 5.7	172 56.1	7 23.7
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 4	17 35	0 41	2 21	7 51	3.8	17 2	.1
55	6 1	17 38	0 36	2 2	7 35	3.4	17 20	.5
50	5 59	17 40	0 32	1 48	7 23	3.1	17 35	.8
45	5 57	17 42	0 29	1 38	7 13	2.9	17 46	1.0
40	5 56	17 44	0 27	1 30	7 5	2.7	17 56	1.1
35	5 54	17 45	0 25	1 24	6 58	2.6	18 4	1.3
30	5 53	17 46	0 24	1 19	6 52	2.4	18 11	1.4
20	5 51	17 49	0 22	1 13	6 41	2.2	18 24	1.6
10	5 49	17 51	0 21	1 10	6 32	2.0	18 35	1.7
0	5 47	17 53	0 21	1 9	6 24	1.9	18 45	1.9
10	5 44	17 55	0 21	1 10	6 16	1.7	18 56	2.1
20	5 42	17 58	0 22	1 14	6 7	1.5	19 7	2.2
30	5 39	18 1	0 24	1 21	5 57	1.3	19 20	2.4
35	5 38	18 3	0 25	1 26	5 51	1.2	19 27	2.6
40	5 36	18 5	0 27	1 32	5 45	1.1	19 36	2.7
45	5 33	18 7	0 30	1 41	5 37	.9	19 46	2.9
50	5 31	18 10	0 33	1 53	5 29	.7	19 58	3.1
55	5 27	18 14	0 37	2 9	5 18	.4	20 13	3.4
60	5 23	18 18	0 42	2 34	5 3	.1	20 33	3.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	9 58.4	.8	16.0	$T_{\overline{m}}$ 12 35	1.9	56.0	15.3
12	10 8.1	$T_{\overline{m}_\odot}$ 11 h 49.9 min		Starost .7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 43	.1	145	-3.8	♃	18 19	.0	76	-2.2
♂	13 4	.1	155	1.6	♄	10 30	.0	193	1.1

1. OKTOBAR 2008. SREDA

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 34.4	- 3 14.8	10 5.6	154 8.6	-14 27.8	164 10.1	-10 31.8
2	212 34.8	- 3 16.8	40 10.5	184 7.6	-14 30.0	194 11.9	-10 33.0
4	242 35.2	- 3 18.7	70 15.4	214 6.7	-14 32.2	224 13.6	-10 34.3
6	272 35.6	- 3 20.7	100 20.3	244 5.7	-14 34.4	254 15.4	-10 35.5
8	302 36.0	- 3 22.6	130 25.3	274 4.8	-14 36.6	284 17.1	-10 36.8
10	332 36.4	- 3 24.5	160 30.2	304 3.8	-14 38.8	314 18.9	-10 38.0
12	2 36.8	- 3 26.5	190 35.1	334 2.8	-14 41.0	344 20.6	-10 39.3
14	32 37.2	- 3 28.4	220 40.1	4 1.9	-14 43.2	14 22.4	-10 40.5
16	62 37.6	- 3 30.4	250 45.0	34 .9	-14 45.3	44 24.1	-10 41.8
18	92 38.0	- 3 32.3	280 49.9	63 60.0	-14 47.5	74 25.8	-10 43.0
20	122 38.4	- 3 34.2	310 54.8	93 59.0	-14 49.7	104 27.6	-10 44.3
22	152 38.8	- 3 36.2	340 59.8	123 58.0	-14 51.9	134 29.3	-10 45.5
Δ	2	-10		-5	-11	9	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	166 10.1	136	-15 7.7	-122	85 33.5	-23 5.7	203 .5	7 23.5
2	195 15.4	136	-15 32.1	-120	115 38.1	-23 5.6	233 4.9	7 23.3
4	224 20.5	135	-15 56.2	-119	145 42.6	-23 5.6	263 9.2	7 23.0
6	253 25.5	134	-16 20.0	-117	175 47.2	-23 5.6	293 13.6	7 22.8
8	282 30.3	133	-16 43.4	-116	205 51.7	-23 5.5	323 18.0	7 22.6
10	311 35.0	133	-17 6.5	-114	235 56.2	-23 5.5	353 22.3	7 22.4
12	340 39.6	132	-17 29.3	-112	266 .8	-23 5.5	23 26.7	7 22.1
14	9 43.9	131	-17 51.8	-111	296 5.3	-23 5.5	53 31.1	7 21.9
16	38 48.2	130	-18 13.9	-109	326 9.9	-23 5.4	83 35.4	7 21.7
18	67 52.2	130	-18 35.6	-107	356 14.4	-23 5.4	113 39.8	7 21.5
20	96 56.1	129	-18 57.0	-105	26 18.9	-23 5.4	143 44.2	7 21.3
22	125 59.9	128	-19 18.1	-103	56 23.5	-23 5.3	173 48.6	7 21.0
Δ					23	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 6	17 32	0 41	2 21	9 21	3.8	17 4	.2
55	6 3	17 35	0 36	2 2	8 56	3.3	17 32	.7
50	6 0	17 38	0 32	1 48	8 36	3.0	17 53	.9
45	5 58	17 40	0 29	1 38	8 22	2.8	18 9	1.1
40	5 57	17 42	0 27	1 30	8 9	2.7	18 23	1.3
35	5 55	17 44	0 25	1 24	7 59	2.5	18 34	1.4
30	5 54	17 45	0 24	1 19	7 50	2.4	18 44	1.5
20	5 51	17 48	0 22	1 13	7 35	2.2	19 2	1.7
10	5 49	17 50	0 21	1 10	7 21	2.1	19 17	1.8
0	5 46	17 53	0 21	1 9	7 9	1.9	19 31	2.0
10	5 44	17 55	0 21	1 10	6 56	1.8	19 45	2.1
20	5 41	17 58	0 22	1 14	6 43	1.6	20 0	2.3
30	5 38	18 2	0 24	1 21	6 29	1.4	20 18	2.4
35	5 36	18 3	0 25	1 26	6 20	1.3	20 28	2.5
40	5 34	18 6	0 27	1 32	6 10	1.2	20 40	2.7
45	5 32	18 8	0 30	1 41	5 59	1.0	20 54	2.8
50	5 28	18 12	0 33	1 53	5 45	.8	21 11	3.0
55	5 25	18 16	0 37	2 10	5 28	.6	21 33	3.3
60	5 20	18 21	0 43	2 35	5 6	.2	22 4	3.8
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	10 17.8	.8	16.0	$T_{\overline{m}}$ 13 20	2.0	55.5	15.1
12	10 27.4	$T_{\overline{m}_\odot}$ 11 h 49.5 min		Starost 1.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 44	.1	144	-3.8	♃	18 15	.0	75	-2.2
♂	13 3	.1	154	1.6	♄	10 26	.0	193	1.1

2. OKTOBAR ČETVRTAK

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 39.2	- 3 38.1	11 4.7	153 57.1	-14 54.0	164 31.1	-10 46.8
2	212 39.6	- 3 40.0	41 9.6	183 56.1	-14 56.2	194 32.8	-10 48.0
4	242 40.0	- 3 42.0	71 14.6	213 55.1	-14 58.4	224 34.6	-10 49.3
6	272 40.4	- 3 43.9	101 19.5	243 54.1	-15 .5	254 36.3	-10 50.5
8	302 40.8	- 3 45.8	131 24.4	273 53.2	-15 2.7	284 38.0	-10 51.7
10	332 41.2	- 3 47.8	161 29.3	303 52.2	-15 4.9	314 39.8	-10 53.0
12	2 41.5	- 3 49.7	191 34.3	333 51.2	-15 7.0	344 41.5	-10 54.2
14	32 41.9	- 3 51.6	221 39.2	3 50.2	-15 9.2	14 43.2	-10 55.5
16	62 42.3	- 3 53.6	251 44.1	33 49.2	-15 11.3	44 45.0	-10 56.7
18	92 42.7	- 3 55.5	281 49.0	63 48.2	-15 13.5	74 46.7	-10 58.0
20	122 43.1	- 3 57.4	311 54.0	93 47.2	-15 15.6	104 48.5	-10 59.2
22	152 43.5	- 3 59.4	341 58.9	123 46.3	-15 17.7	134 50.2	-11 .4
Δ	2	-10		-5	-11	9	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 3.4	127	-19 38.7	-101	86 28.0	-23 5.3	203 52.9	7 20.8
2	184 6.8	126	-19 59.0	-99	116 32.5	-23 5.3	233 57.3	7 20.6
4	213 10.1	125	-20 18.9	-97	146 37.0	-23 5.2	264 1.7	7 20.4
6	242 13.1	124	-20 38.3	-95	176 41.6	-23 5.2	294 6.0	7 20.1
8	271 16.0	124	-20 57.4	-93	206 46.1	-23 5.2	324 10.4	7 19.9
10	300 18.7	123	-21 16.1	-91	236 50.6	-23 5.1	354 14.8	7 19.7
12	329 21.2	122	-21 34.4	-89	266 55.1	-23 5.1	24 19.2	7 19.5
14	358 23.6	121	-21 52.3	-87	296 59.6	-23 5.1	54 23.5	7 19.3
16	27 25.8	120	-22 9.7	-85	327 4.2	-23 5.0	84 27.9	7 19.0
18	56 27.8	119	-22 26.7	-83	357 8.7	-23 5.0	114 32.3	7 18.8
20	85 29.7	118	-22 43.3	-81	27 13.2	-23 5.0	144 36.7	7 18.6
22	114 31.3	118	-22 59.5	-79	57 17.7	-23 4.9	174 41.0	7 18.4
Δ					23	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 9	17 29	0 41	2 20	10 53	3.8	17 10	.4
55	6 5	17 33	0 36	2 1	10 16	3.2	17 48	.9
50	6 2	17 36	0 32	1 48	9 50	2.9	18 16	1.2
45	5 60	17 38	0 29	1 38	9 30	2.8	18 37	1.4
40	5 57	17 40	0 27	1 30	9 14	2.6	18 54	1.5
35	5 56	17 42	0 25	1 24	9 0	2.5	19 8	1.6
30	5 54	17 44	0 24	1 19	8 48	2.4	19 20	1.7
20	5 51	17 47	0 22	1 13	8 28	2.3	19 42	1.8
10	5 49	17 50	0 21	1 10	8 11	2.1	20 1	1.9
0	5 46	17 52	0 21	1 9	7 55	2.0	20 18	2.0
10	5 43	17 55	0 21	1 10	7 39	1.9	20 36	2.1
20	5 40	17 58	0 22	1 14	7 22	1.8	20 55	2.3
30	5 37	18 2	0 24	1 21	7 3	1.6	21 16	2.4
35	5 35	18 4	0 25	1 26	6 52	1.5	21 29	2.5
40	5 32	18 7	0 27	1 33	6 39	1.4	21 44	2.6
45	5 30	18 10	0 30	1 41	6 24	1.2	22 2	2.7
50	5 26	18 13	0 33	1 53	6 5	1.1	22 24	2.9
55	5 22	18 18	0 37	2 10	5 42	.8	22 53	3.1
60	5 17	18 23	0 43	2 37	5 10	.3	23 35	3.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	10 36.9	.8	16.0	$T_{\overline{m}}$ 14 7	2.0	55.0	15.0
12	10 46.3	$T_{\overline{m}_\odot}$ 11 h 49.2 min		Starost 2.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 45	.1	143	-3.8	♃	18 11	.0	75	-2.2
♂	13 1	.1	153	1.6	♄	10 23	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 43.9	- 4 1.3	12 3.8	153 45.3	-15 19.9	164 51.9	-11 1.7
2	212 44.3	- 4 3.2	42 8.8	183 44.3	-15 22.0	194 53.7	-11 2.9
4	242 44.7	- 4 5.2	72 13.7	213 43.3	-15 24.2	224 55.4	-11 4.2
6	272 45.1	- 4 7.1	102 18.6	243 42.3	-15 26.3	254 57.1	-11 5.4
8	302 45.4	- 4 9.0	132 23.5	273 41.3	-15 28.4	284 58.8	-11 6.6
10	332 45.8	- 4 11.0	162 28.5	303 40.3	-15 30.6	315 .6	-11 7.9
12	2 46.2	- 4 12.9	192 33.4	333 39.3	-15 32.7	345 2.3	-11 9.1
14	32 46.6	- 4 14.8	222 38.3	3 38.3	-15 34.8	15 4.0	-11 10.4
16	62 47.0	- 4 16.8	252 43.3	33 37.3	-15 36.9	45 5.8	-11 11.6
18	92 47.4	- 4 18.7	282 48.2	63 36.3	-15 39.0	75 7.5	-11 12.8
20	122 47.8	- 4 20.6	312 53.1	93 35.2	-15 41.2	105 9.2	-11 14.1
22	152 48.1	- 4 22.6	342 58.0	123 34.2	-15 43.3	135 10.9	-11 15.3
Δ	2	-10		-5	-11	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 32.8	117	-23 15.2	-76	87 22.2	-23 4.9	204 45.4	7 18.2
2	172 34.2	116	-23 30.5	-74	117 26.7	-23 4.9	234 49.8	7 17.9
4	201 35.3	115	-23 45.3	-72	147 31.3	-23 4.8	264 54.2	7 17.7
6	230 36.3	114	-23 59.7	-70	177 35.8	-23 4.8	294 58.5	7 17.5
8	259 37.2	113	-24 13.6	-67	207 40.3	-23 4.8	325 2.9	7 17.3
10	288 37.9	113	-24 27.0	-65	237 44.8	-23 4.7	355 7.3	7 17.1
12	317 38.4	112	-24 40.0	-63	267 49.3	-23 4.7	25 11.6	7 16.8
14	346 38.8	111	-24 52.5	-60	297 53.8	-23 4.6	55 16.0	7 16.6
16	15 39.0	110	-25 4.5	-58	327 58.3	-23 4.6	85 20.4	7 16.4
18	44 39.1	110	-25 16.0	-55	358 2.8	-23 4.6	115 24.8	7 16.2
20	73 39.0	109	-25 27.1	-53	28 7.3	-23 4.5	145 29.2	7 16.0
22	102 38.8	108	-25 37.6	-50	58 11.8	-23 4.5	175 33.5	7 15.7
Δ					23	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 11	17 26	0 41	2 20	12 23	3.5	17 20	.9
55	6 7	17 30	0 36	2 1	11 33	2.9	18 11	1.4
50	6 3	17 33	0 32	1 48	11 0	2.7	18 45	1.6
45	6 1	17 36	0 29	1 38	10 36	2.6	19 10	1.7
40	5 58	17 39	0 27	1 30	10 16	2.5	19 30	1.8
35	5 56	17 41	0 25	1 24	10 0	2.4	19 47	1.8
30	5 55	17 43	0 24	1 19	9 46	2.3	20 1	1.9
20	5 51	17 46	0 22	1 13	9 23	2.2	20 26	2.0
10	5 49	17 49	0 21	1 10	9 2	2.2	20 47	2.0
0	5 46	17 52	0 21	1 9	8 43	2.1	21 7	2.1
10	5 43	17 55	0 21	1 10	8 25	2.0	21 27	2.2
20	5 39	17 59	0 22	1 14	8 4	1.9	21 49	2.2
30	5 36	18 3	0 24	1 21	7 41	1.8	22 14	2.3
35	5 33	18 5	0 25	1 26	7 28	1.7	22 28	2.3
40	5 31	18 8	0 27	1 33	7 12	1.6	22 46	2.4
45	5 28	18 11	0 30	1 42	6 54	1.5	23 6	2.5
50	5 24	18 15	0 33	1 54	6 31	1.4	23 32	2.6
55	5 20	18 19	0 37	2 11	6 1	1.1	. . .	.0
60	5 14	18 26	0 43	2 38	5 17	.6	. . .	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	10 55.8	.8	16.0	$T_{\overline{m}}$ 14 55	2.1	54.6	14.9
12	11 5.0	$T_{\overline{m}_\odot}$ 11 h 48.9 min		Starost 3.7 d	Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 45	.1	142	-3.8	♃	18 8	.0	75	-2.1
♂	12 60	.1	153	1.6	♄	10 19	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 48.5	- 4 24.5	13 3.0	153 33.2	-15 45.4	165 12.7	-11 16.5
2	212 48.9	- 4 26.4	43 7.9	183 32.2	-15 47.5	195 14.4	-11 17.8
4	242 49.3	- 4 28.3	73 12.8	213 31.2	-15 49.6	225 16.1	-11 19.0
6	272 49.7	- 4 30.3	103 17.8	243 30.2	-15 51.7	255 17.8	-11 20.2
8	302 50.0	- 4 32.2	133 22.7	273 29.1	-15 53.8	285 19.5	-11 21.5
10	332 50.4	- 4 34.1	163 27.6	303 28.1	-15 55.9	315 21.3	-11 22.7
12	2 50.8	- 4 36.0	193 32.5	333 27.1	-15 58.0	345 23.0	-11 23.9
14	32 51.2	- 4 38.0	223 37.5	3 26.1	-16 .1	15 24.7	-11 25.2
16	62 51.6	- 4 39.9	253 42.4	33 25.0	-16 2.2	45 26.4	-11 26.4
18	92 51.9	- 4 41.8	283 47.3	63 24.0	-16 4.3	75 28.1	-11 27.6
20	122 52.3	- 4 43.7	313 52.3	93 23.0	-16 6.3	105 29.8	-11 28.9
22	152 52.7	- 4 45.7	343 57.2	123 21.9	-16 8.4	135 31.6	-11 30.1
Δ	2	-10		-5	-10	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	131 38.5	108	-25 47.7	-48	88 16.3	-23 4.5	205 37.9	7 15.5
2	160 38.1	107	-25 57.3	-45	118 20.8	-23 4.4	235 42.3	7 15.3
4	189 37.5	107	-26 6.4	-43	148 25.3	-23 4.4	265 46.7	7 15.1
6	218 36.8	106	-26 15.0	-40	178 29.8	-23 4.4	295 51.0	7 14.9
8	247 36.0	106	-26 23.0	-38	208 34.3	-23 4.3	325 55.4	7 14.7
10	276 35.1	105	-26 30.6	-35	238 38.8	-23 4.3	355 59.8	7 14.4
12	305 34.2	105	-26 37.7	-33	268 43.2	-23 4.2	26 4.2	7 14.2
14	334 33.1	104	-26 44.2	-30	298 47.7	-23 4.2	56 8.5	7 14.0
16	3 31.9	104	-26 50.2	-28	328 52.2	-23 4.2	86 12.9	7 13.8
18	32 30.7	103	-26 55.7	-25	358 56.7	-23 4.1	116 17.3	7 13.6
20	61 29.4	103	-27 .7	-22	29 1.2	-23 4.1	146 21.7	7 13.3
22	90 28.0	103	-27 5.2	-20	59 5.7	-23 4.1	176 26.1	7 13.1
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 13	17 23	0 41	2 20	13 46	2.7	17 41	1.8
55	6 9	17 28	0 36	2 1	12 44	2.4	18 44	2.0
50	6 5	17 31	0 32	1 48	12 6	2.4	19 22	2.0
45	6 2	17 34	0 29	1 37	11 38	2.3	19 50	2.0
40	5 59	17 37	0 27	1 30	11 16	2.3	20 13	2.1
35	5 57	17 39	0 25	1 24	10 58	2.2	20 31	2.1
30	5 55	17 42	0 24	1 19	10 43	2.2	20 47	2.1
20	5 52	17 45	0 22	1 13	10 17	2.2	21 13	2.1
10	5 48	17 49	0 21	1 10	9 54	2.2	21 36	2.1
0	5 45	17 52	0 21	1 9	9 33	2.1	21 58	2.1
10	5 42	17 55	0 21	1 10	9 12	2.1	22 19	2.1
20	5 39	17 59	0 22	1 14	8 50	2.0	22 42	2.1
30	5 34	18 3	0 24	1 21	8 24	2.0	23 9	2.1
35	5 32	18 6	0 26	1 26	8 9	2.0	23 25	2.1
40	5 29	18 9	0 27	1 33	7 52	1.9	23 43	2.1
45	5 26	18 12	0 30	1 42	7 31	1.9	. . .	.0
50	5 22	18 16	0 33	1 54	7 4	1.8	. . .	.0
55	5 17	18 21	0 37	2 12	6 28	1.7	0 8	2.7
60	5 11	18 28	0 43	2 40	5 32	1.3	1 3	3.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	11 14.3	.8	16.0	$T_{\overline{m}}$ 15 45	2.1	54.3	14.8
12	11 23.4	$T_{\overline{m}_\odot}$ 11 h 48.6 min		Starost 4.7 d	Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 46	.1	140	-3.8	♃	18 4	.0	75	-2.1
♂	12 58	.1	152	1.6	♄	10 16	.0	193	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 53.1	- 4 47.6	14 2.1	153 20.9	-16 10.5	165 33.3	-11 31.3
2	212 53.4	- 4 49.5	44 7.0	183 19.9	-16 12.6	195 35.0	-11 32.6
4	242 53.8	- 4 51.4	74 12.0	213 18.8	-16 14.7	225 36.7	-11 33.8
6	272 54.2	- 4 53.4	104 16.9	243 17.8	-16 16.7	255 38.4	-11 35.0
8	302 54.6	- 4 55.3	134 21.8	273 16.7	-16 18.8	285 40.1	-11 36.2
10	332 54.9	- 4 57.2	164 26.8	303 15.7	-16 20.9	315 41.8	-11 37.5
12	2 55.3	- 4 59.1	194 31.7	333 14.6	-16 22.9	345 43.5	-11 38.7
14	32 55.7	- 5 1.0	224 36.6	3 13.6	-16 25.0	15 45.2	-11 39.9
16	62 56.0	- 5 3.0	254 41.5	33 12.5	-16 27.0	45 46.9	-11 41.1
18	92 56.4	- 5 4.9	284 46.5	63 11.5	-16 29.1	75 48.6	-11 42.4
20	122 56.8	- 5 6.8	314 51.4	93 10.4	-16 31.1	105 50.4	-11 43.6
22	152 57.1	- 5 8.7	344 56.3	123 9.4	-16 33.2	135 52.1	-11 44.8
Δ	2	-10		-5	-10	9	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	119 26.6	103	-27 9.2	-17	89 10.2	-23 4.0	206 30.4	7 12.9
2	148 25.1	102	-27 12.6	-15	119 14.6	-23 4.0	236 34.8	7 12.7
4	177 23.6	102	-27 15.5	-12	149 19.1	-23 3.9	266 39.2	7 12.5
6	206 22.0	102	-27 17.9	-9	179 23.6	-23 3.9	296 43.6	7 12.3
8	235 20.4	102	-27 19.8	-7	209 28.1	-23 3.9	326 48.0	7 12.0
10	264 18.8	102	-27 21.1	-4	239 32.6	-23 3.8	356 52.3	7 11.8
12	293 17.2	102	-27 21.9	-1	269 37.0	-23 3.8	26 56.7	7 11.6
14	322 15.6	102	-27 22.2	1	299 41.5	-23 3.8	57 1.1	7 11.4
16	351 14.0	102	-27 21.9	4	329 46.0	-23 3.7	87 5.5	7 11.2
18	20 12.4	102	-27 21.2	6	359 50.4	-23 3.7	117 9.9	7 10.9
20	49 10.8	102	-27 19.9	9	29 54.9	-23 3.6	147 14.2	7 10.7
22	78 9.2	102	-27 18.0	12	59 59.4	-23 3.6	177 18.6	7 10.5
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 16	17 20	0 41	2 20	14 49	1.5	18 24	2.8
55	6 11	17 25	0 36	2 1	13 42	1.8	19 31	2.6
50	6 7	17 29	0 32	1 47	13 2	1.9	20 11	2.4
45	6 3	17 33	0 29	1 37	12 33	2.0	20 40	2.4
40	6 0	17 36	0 27	1 30	12 11	2.0	21 2	2.3
35	5 58	17 38	0 25	1 24	11 52	2.0	21 21	2.3
30	5 56	17 40	0 24	1 19	11 36	2.1	21 37	2.3
20	5 52	17 44	0 22	1 13	11 9	2.1	22 4	2.2
10	5 48	17 48	0 21	1 10	10 46	2.1	22 27	2.2
0	5 45	17 52	0 21	1 9	10 24	2.1	22 49	2.1
10	5 42	17 55	0 21	1 10	10 2	2.1	23 10	2.1
20	5 38	17 59	0 22	1 14	9 39	2.2	23 33	2.0
30	5 33	18 4	0 24	1 21	9 12	2.2	. . ..	.0
35	5 31	18 7	0 26	1 26	8 56	2.2	. . ..	.0
40	5 28	18 10	0 27	1 33	8 38	2.2	. . ..	.0
45	5 24	18 13	0 30	1 42	8 15	2.2	0 5	2.1
50	5 20	18 18	0 33	1 55	7 47	2.2	0 33	2.1
55	5 15	18 23	0 37	2 13	7 8	2.3	1 12	2.1
60	5 8	18 31	0 43	2 41	6 3	2.3	2 17	2.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 32.4	.7	16.0	$T_{\overline{m}}$	16 36	2.1	54.2	14.8
12	11 41.3	$T_{\overline{m}_\odot}$	11 h 48.3 min	Starost	5.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 47	.1	139	-3.8	♃	18 1	.0	75	-2.1
♂	12 57	.1	152	1.6	♄	10 12	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 57.5	- 5 10.6	15 1.3	153 8.3	-16 35.2	165 53.8	-11 46.0
2	212 57.9	- 5 12.6	45 6.2	183 7.2	-16 37.3	195 55.5	-11 47.3
4	242 58.2	- 5 14.5	75 11.1	213 6.2	-16 39.3	225 57.2	-11 48.5
6	272 58.6	- 5 16.4	105 16.0	243 5.1	-16 41.4	255 58.9	-11 49.7
8	302 59.0	- 5 18.3	135 21.0	273 4.0	-16 43.4	286 .6	-11 50.9
10	332 59.3	- 5 20.2	165 25.9	303 3.0	-16 45.4	316 2.3	-11 52.2
12	2 59.7	- 5 22.1	195 30.8	333 1.9	-16 47.5	346 4.0	-11 53.4
14	33 .1	- 5 24.1	225 35.7	3 .8	-16 49.5	16 5.7	-11 54.6
16	63 .4	- 5 26.0	255 40.7	32 59.7	-16 51.5	46 7.4	-11 55.8
18	93 .8	- 5 27.9	285 45.6	62 58.7	-16 53.5	76 9.1	-11 57.0
20	123 1.2	- 5 29.8	315 50.5	92 57.6	-16 55.5	106 10.7	-11 58.3
22	153 1.5	- 5 31.7	345 55.5	122 56.5	-16 57.6	136 12.4	-11 59.5
Δ	2	-10		-5	-10	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	107 7.7	103	-27 15.7	14	90 3.8	-23 3.6	207 23.0	7 10.3
2	136 6.2	103	-27 12.8	17	120 8.3	-23 3.5	237 27.4	7 10.1
4	165 4.7	103	-27 9.4	20	150 12.8	-23 3.5	267 31.8	7 9.9
6	194 3.3	103	-27 5.5	22	180 17.2	-23 3.4	297 36.1	7 9.6
8	223 2.0	104	-27 1.1	25	210 21.7	-23 3.4	327 40.5	7 9.4
10	252 .7	104	-26 56.1	27	240 26.2	-23 3.4	357 44.9	7 9.2
12	280 59.5	104	-26 50.6	30	270 30.6	-23 3.3	27 49.3	7 9.0
14	309 58.4	105	-26 44.7	32	300 35.1	-23 3.3	57 53.7	7 8.8
16	338 57.3	105	-26 38.2	35	330 39.5	-23 3.2	87 58.1	7 8.6
18	7 56.4	106	-26 31.1	38	0 44.0	-23 3.2	118 2.4	7 8.3
20	36 55.5	106	-26 23.6	40	30 48.4	-23 3.2	148 6.8	7 8.1
22	65 54.8	107	-26 15.6	43	60 52.9	-23 3.1	178 11.2	7 7.9
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 18	17 17	0 41	2 19	15 26	.8	19 32	3.5
55	6 13	17 22	0 36	2 1	14 26	1.3	20 32	3.0
50	6 8	17 27	0 32	1 47	13 48	1.5	21 9	2.8
45	6 5	17 31	0 29	1 37	13 21	1.6	21 36	2.6
40	6 1	17 34	0 27	1 30	12 59	1.7	21 58	2.5
35	5 59	17 37	0 25	1 24	12 41	1.8	22 16	2.4
30	5 56	17 39	0 24	1 19	12 25	1.9	22 31	2.4
20	5 52	17 44	0 22	1 13	11 59	1.9	22 57	2.2
10	5 48	17 47	0 21	1 10	11 36	2.0	23 19	2.2
0	5 45	17 51	0 21	1 9	11 15	2.1	23 39	2.1
10	5 41	17 55	0 21	1 10	10 54	2.2	23 60	2.0
20	5 37	17 59	0 22	1 14	10 31	2.2	. . ..	.0
30	5 32	18 4	0 24	1 21	10 4	2.3	0 0	2.0
35	5 29	18 7	0 26	1 27	9 49	2.4	0 16	1.9
40	5 26	18 11	0 27	1 33	9 30	2.4	0 34	1.9
45	5 22	18 15	0 30	1 43	9 9	2.5	0 57	1.8
50	5 18	18 19	0 33	1 55	8 41	2.6	1 25	1.7
55	5 12	18 25	0 37	2 14	8 2	2.8	2 4	1.5
60	5 5	18 33	0 43	2 43	6 59	3.2	3 7	1.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 50.2	.7	16.0	$T_{\overline{m}}$	17 27	2.1	54.2	14.8
12	11 59.0	$T_{\overline{m}_\odot}$	11 h 48.0 min	Starost	6.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 48	.1	138	-3.8	♃	17 57	.0	75	-2.1
♂	12 56	.1	151	1.6	♄	10 9	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 1.9	- 5 33.6	16 .4	152 55.4	-16 59.6	166 14.1	-12 .7
2	213 2.2	- 5 35.5	46 5.3	182 54.3	-17 1.6	196 15.8	-12 1.9
4	243 2.6	- 5 37.4	76 10.2	212 53.2	-17 3.6	226 17.5	-12 3.1
6	273 2.9	- 5 39.4	106 15.2	242 52.2	-17 5.6	256 19.2	-12 4.4
8	303 3.3	- 5 41.3	136 20.1	272 51.1	-17 7.6	286 20.9	-12 5.6
10	333 3.7	- 5 43.2	166 25.0	302 50.0	-17 9.6	316 22.6	-12 6.8
12	3 4.0	- 5 45.1	196 30.0	332 48.9	-17 11.6	346 24.3	-12 8.0
14	33 4.4	- 5 47.0	226 34.9	2 47.8	-17 13.6	16 26.0	-12 9.2
16	63 4.7	- 5 48.9	256 39.8	32 46.7	-17 15.6	46 27.6	-12 10.4
18	93 5.1	- 5 50.8	286 44.7	62 45.6	-17 17.5	76 29.3	-12 11.6
20	123 5.4	- 5 52.7	316 49.7	92 44.5	-17 19.5	106 31.0	-12 12.9
22	153 5.8	- 5 54.6	346 54.6	122 43.4	-17 21.5	136 32.7	-12 14.1
Δ	2	-10		-5	-10	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	94 54.1	107	-26 7.1	45	90 57.4	-23 3.1	208 15.6	7 7.7
2	123 53.6	108	-25 58.0	48	121 1.8	-23 3.0	238 20.0	7 7.5
4	152 53.2	109	-25 48.5	50	151 6.3	-23 3.0	268 24.4	7 7.3
6	181 52.9	109	-25 38.5	53	181 10.7	-23 3.0	298 28.7	7 7.1
8	210 52.7	110	-25 28.0	55	211 15.1	-23 2.9	328 33.1	7 6.8
10	239 52.7	110	-25 17.0	57	241 19.6	-23 2.9	358 37.5	7 6.6
12	268 52.8	111	-25 5.5	60	271 24.0	-23 2.8	28 41.9	7 6.4
14	297 53.0	112	-24 53.5	62	301 28.5	-23 2.8	58 46.3	7 6.2
16	326 53.4	113	-24 41.1	65	331 32.9	-23 2.7	88 50.7	7 6.0
18	355 53.9	113	-24 28.2	67	1 37.4	-23 2.7	118 55.1	7 5.8
20	24 54.6	114	-24 14.8	69	31 41.8	-23 2.7	148 59.5	7 5.6
22	53 55.4	115	-24 .9	72	61 46.2	-23 2.6	179 3.8	7 5.3
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 21	17 14	0 41	2 19	15 45	.4	20 57	3.8
55	6 14	17 20	0 36	2 1	14 56	.9	21 44	3.3
50	6 10	17 25	0 32	1 47	14 24	1.1	22 16	3.0
45	6 6	17 29	0 29	1 37	13 60	1.3	22 39	2.8
40	6 2	17 32	0 27	1 30	13 40	1.5	22 58	2.6
35	5 60	17 35	0 25	1 24	13 24	1.6	23 14	2.5
30	5 57	17 38	0 24	1 19	13 10	1.7	23 28	2.4
20	5 53	17 43	0 22	1 13	12 46	1.8	23 51	2.3
10	5 48	17 47	0 21	1 10	12 25	1.9	.. ..	.0
0	5 44	17 51	0 21	1 9	12 5	2.0	.. ..	.0
10	5 40	17 55	0 21	1 10	11 45	2.1	.. ..	.0
20	5 36	17 60	0 22	1 14	11 24	2.3	0 22	1.9
30	5 31	18 5	0 24	1 21	10 60	2.4	0 47	1.8
35	5 28	18 8	0 26	1 27	10 46	2.5	1 2	1.7
40	5 24	18 12	0 27	1 34	10 29	2.6	1 19	1.6
45	5 20	18 16	0 30	1 43	10 9	2.7	1 40	1.5
50	5 15	18 21	0 33	1 56	9 44	2.9	2 6	1.3
55	5 9	18 27	0 37	2 15	9 9	3.2	2 41	1.1
60	5 2	18 35	0 44	2 45	8 17	3.7	3 34	.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 7.7	.7	16.0	$T_{\overline{m}}$	18 17	2.0	54.4	14.8
12	12 16.2	$T_{\overline{m}_\odot}$	11 h 47.7 min	Starost	7.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 49	.1	137	-3.8	♃	17 54	.0	75	-2.1
♂	12 54	.1	150	1.6	♄	10 5	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 6.1	- 5 56.5	16 59.5	152 42.3	-17 23.5	166 34.4	-12 15.3
2	213 6.5	- 5 58.4	47 4.5	182 41.2	-17 25.5	196 36.1	-12 16.5
4	243 6.8	- 6 .3	77 9.4	212 40.0	-17 27.4	226 37.8	-12 17.7
6	273 7.2	- 6 2.2	107 14.3	242 38.9	-17 29.4	256 39.4	-12 18.9
8	303 7.5	- 6 4.1	137 19.2	272 37.8	-17 31.4	286 41.1	-12 20.1
10	333 7.9	- 6 6.0	167 24.2	302 36.7	-17 33.3	316 42.8	-12 21.3
12	3 8.2	- 6 8.0	197 29.1	332 35.6	-17 35.3	346 44.5	-12 22.5
14	33 8.6	- 6 9.9	227 34.0	2 34.5	-17 37.2	16 46.1	-12 23.8
16	63 8.9	- 6 11.8	257 39.0	32 33.3	-17 39.2	46 47.8	-12 25.0
18	93 9.3	- 6 13.7	287 43.9	62 32.2	-17 41.1	76 49.5	-12 26.2
20	123 9.6	- 6 15.6	317 48.8	92 31.1	-17 43.1	106 51.2	-12 27.4
22	153 9.9	- 6 17.5	347 53.7	122 30.0	-17 45.0	136 52.8	-12 28.6
Δ	2	-10		-6	-10	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	82 56.3	116	-23 46.6	74	91 50.7	-23 2.6	209 8.2	7 5.1
2	111 57.4	116	-23 31.8	76	121 55.1	-23 2.5	239 12.6	7 4.9
4	140 58.7	117	-23 16.6	78	151 59.5	-23 2.5	269 17.0	7 4.7
6	170 .1	118	-23 .9	81	182 4.0	-23 2.4	299 21.4	7 4.5
8	199 1.6	119	-22 44.8	83	212 8.4	-23 2.4	329 25.8	7 4.3
10	228 3.4	119	-22 28.2	85	242 12.8	-23 2.4	359 30.2	7 4.1
12	257 5.2	120	-22 11.2	87	272 17.3	-23 2.3	29 34.6	7 3.8
14	286 7.2	121	-21 53.8	89	302 21.7	-23 2.3	59 38.9	7 3.6
16	315 9.4	122	-21 35.9	91	332 26.1	-23 2.2	89 43.3	7 3.4
18	344 11.7	122	-21 17.6	93	2 30.6	-23 2.2	119 47.7	7 3.2
20	13 14.2	123	-20 58.9	96	32 35.0	-23 2.1	149 52.1	7 3.0
22	42 16.8	124	-20 39.8	98	62 39.4	-23 2.1	179 56.5	7 2.8
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 23	17 11	0 42	2 19	15 53	.2	22 28	3.8
55	6 16	17 18	0 36	2 1	15 17	.6	23 3	3.4
50	6 11	17 23	0 32	1 47	14 52	.9	23 27	3.1
45	6 7	17 27	0 29	1 37	14 32	1.1	23 46	2.9
40	6 4	17 31	0 27	1 30	14 15	1.3	.. ..	.0
35	6 0	17 34	0 25	1 24	14 1	1.4	.. ..	.0
30	5 58	17 37	0 24	1 19	13 49	1.5	.. ..	.0
20	5 53	17 42	0 22	1 13	13 29	1.7	.. ..	.0
10	5 48	17 46	0 21	1 10	13 11	1.8	0 10	2.1
0	5 44	17 51	0 21	1 9	12 54	2.0	0 29	2.0
10	5 40	17 55	0 21	1 10	12 37	2.1	0 47	1.9
20	5 35	18 0	0 22	1 14	12 19	2.3	1 7	1.7
30	5 30	18 6	0 24	1 22	11 58	2.4	1 29	1.6
35	5 26	18 9	0 26	1 27	11 45	2.6	1 42	1.5
40	5 23	18 13	0 28	1 34	11 31	2.7	1 57	1.4
45	5 19	18 17	0 30	1 43	11 14	2.8	2 15	1.2
50	5 13	18 23	0 33	1 56	10 53	3.0	2 37	1.0
55	5 7	18 29	0 38	2 16	10 25	3.3	3 6	.7
60	4 59	18 38	0 44	2 47	9 45	3.8	3 48	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 24.7	.7	16.0	$T_{\overline{m}}$	19 5	2.0	54.7	14.9
12	12 33.0	$T_{\overline{m}_\odot}$	11 h 47.5 min	Starost	8.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 50	.1	136	-3.8	♃	17 50	.0	75	-2.1
♂	12 53	.1	150	1.6	♄	10 2	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 10.3	- 6 19.4	17 58.7	152 28.8	-17 47.0	166 54.5	-12 29.8
2	213 10.6	- 6 21.3	48 3.6	182 27.7	-17 48.9	196 56.2	-12 31.0
4	243 11.0	- 6 23.2	78 8.5	212 26.6	-17 50.8	226 57.9	-12 32.2
6	273 11.3	- 6 25.1	108 13.5	242 25.4	-17 52.8	256 59.5	-12 33.4
8	303 11.6	- 6 26.9	138 18.4	272 24.3	-17 54.7	287 1.2	-12 34.6
10	333 12.0	- 6 28.8	168 23.3	302 23.1	-17 56.6	317 2.9	-12 35.8
12	3 12.3	- 6 30.7	198 28.2	332 22.0	-17 58.6	347 4.5	-12 37.0
14	33 12.7	- 6 32.6	228 33.2	2 20.9	-18 .5	17 6.2	-12 38.2
16	63 13.0	- 6 34.5	258 38.1	32 19.7	-18 2.4	47 7.9	-12 39.4
18	93 13.3	- 6 36.4	288 43.0	62 18.6	-18 4.3	77 9.5	-12 40.6
20	123 13.7	- 6 38.3	318 47.9	92 17.4	-18 6.2	107 11.2	-12 41.8
22	153 14.0	- 6 40.2	348 52.9	122 16.3	-18 8.1	137 12.9	-12 43.0
Δ	2	-9		-6	-10	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	71 19.6	125	-20 20.3	100	92 43.8	-23 2.0	210 .9	7 2.6
2	100 22.5	125	-20 .4	102	122 48.2	-23 2.0	240 5.3	7 2.4
4	129 25.6	126	-19 40.1	104	152 52.7	-23 2.0	270 9.7	7 2.1
6	158 28.8	127	-19 19.4	105	182 57.1	-23 1.9	300 14.1	7 1.9
8	187 32.2	127	-18 58.3	107	213 1.5	-23 1.9	330 18.5	7 1.7
10	216 35.6	128	-18 36.8	109	243 5.9	-23 1.8	0 22.8	7 1.5
12	245 39.3	129	-18 14.9	111	273 10.3	-23 1.8	30 27.2	7 1.3
14	274 43.0	129	-17 52.7	113	303 14.7	-23 1.7	60 31.6	7 1.1
16	303 46.9	130	-17 30.1	115	333 19.2	-23 1.7	90 36.0	7 .9
18	332 50.9	131	-17 7.2	116	3 23.6	-23 1.6	120 40.4	7 .7
20	1 55.0	131	-16 43.9	118	33 28.0	-23 1.6	150 44.8	7 .4
22	30 59.2	132	-16 20.2	120	63 32.4	-23 1.5	180 49.2	7 .2
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 25	17 8	0 42	2 19	15 58	.1	23 60	3.8
55	6 18	17 15	0 36	2 1	15 32	.5	. . .	.0
50	6 13	17 21	0 32	1 47	15 13	.7	. . .	.0
45	6 8	17 25	0 29	1 37	14 58	.9	. . .	.0
40	6 5	17 29	0 27	1 30	14 45	1.1	0 2	2.7
35	6 1	17 33	0 25	1 24	14 35	1.2	0 15	2.6
30	5 58	17 36	0 24	1 19	14 25	1.4	0 26	2.5
20	5 53	17 41	0 22	1 13	14 9	1.6	0 45	2.3
10	5 48	17 46	0 21	1 10	13 54	1.7	1 1	2.1
0	5 44	17 50	0 21	1 9	13 41	1.9	1 17	1.9
10	5 39	17 55	0 21	1 11	13 27	2.1	1 32	1.8
20	5 34	18 0	0 22	1 14	13 13	2.3	1 48	1.6
30	5 28	18 6	0 24	1 22	12 56	2.5	2 7	1.4
35	5 25	18 10	0 26	1 27	12 46	2.6	2 17	1.3
40	5 21	18 14	0 28	1 34	12 35	2.7	2 30	1.2
45	5 17	18 19	0 30	1 44	12 22	2.9	2 44	1.0
50	5 11	18 24	0 33	1 57	12 6	3.1	3 2	.8
55	5 4	18 31	0 38	2 16	11 45	3.4	3 24	.5
60	4 56	18 40	0 44	2 49	11 17	3.8	3 55	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 41.3	.7	16.0	$T_{\overline{m}}$	19 52	1.9	55.3	15.1
12	12 49.4	$T_{\overline{m}_\odot}$	11 h 47.2 min	Starost	9.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 51	.1	134	-3.8	♃	17 46	.0	75	-2.1
♂	12 52	.1	149	1.6	♄	9 58	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 14.3	- 6 42.1	18 57.8	152 15.1	-18 10.0	167 14.5	-12 44.2
2	213 14.7	- 6 44.0	49 2.7	182 14.0	-18 11.9	197 16.2	-12 45.4
4	243 15.0	- 6 45.9	79 7.7	212 12.8	-18 13.8	227 17.9	-12 46.6
6	273 15.3	- 6 47.8	109 12.6	242 11.6	-18 15.7	257 19.5	-12 47.8
8	303 15.7	- 6 49.7	139 17.5	272 10.5	-18 17.6	287 21.2	-12 49.0
10	333 16.0	- 6 51.6	169 22.4	302 9.3	-18 19.5	317 22.8	-12 50.2
12	3 16.3	- 6 53.4	199 27.4	332 8.1	-18 21.4	347 24.5	-12 51.4
14	33 16.6	- 6 55.3	229 32.3	2 7.0	-18 23.3	17 26.1	-12 52.6
16	63 17.0	- 6 57.2	259 37.2	32 5.8	-18 25.1	47 27.8	-12 53.8
18	93 17.3	- 6 59.1	289 42.2	62 4.6	-18 27.0	77 29.5	-12 55.0
20	123 17.6	- 7 1.0	319 47.1	92 3.5	-18 28.9	107 31.1	-12 56.2
22	153 17.9	- 7 2.9	349 52.0	122 2.3	-18 30.8	137 32.8	-12 57.4
Δ	2	-9		-6	-9	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	60 3.5	132	-15 56.2	122	93 36.8	-23 1.5	210 53.6	7 .0
2	89 7.9	133	-15 31.9	123	123 41.2	-23 1.5	240 58.0	6 59.8
4	118 12.5	133	-15 7.2	125	153 45.6	-23 1.4	271 2.4	6 59.6
6	147 17.1	134	-14 42.3	126	183 50.0	-23 1.4	301 6.8	6 59.4
8	176 21.8	134	-14 16.9	128	213 54.4	-23 1.3	331 11.2	6 59.2
10	205 26.6	134	-13 51.3	130	243 58.8	-23 1.3	1 15.6	6 59.0
12	234 31.5	135	-13 25.4	131	274 3.2	-23 1.2	31 20.0	6 58.8
14	263 36.4	135	-12 59.2	133	304 7.6	-23 1.2	61 24.4	6 58.5
16	292 41.4	135	-12 32.7	134	334 12.0	-23 1.1	91 28.8	6 58.3
18	321 46.5	136	-12 5.9	135	4 16.4	-23 1.1	121 33.1	6 58.1
20	350 51.6	136	-11 38.8	137	34 20.8	-23 1.0	151 37.5	6 57.9
22	19 56.8	136	-11 11.5	138	64 25.2	-23 1.0	181 41.9	6 57.7
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 28	17 5	0 42	2 19	16 1	.1	. . .	.0
55	6 20	17 13	0 36	2 0	15 44	.4	0 24	3.4
50	6 14	17 19	0 32	1 47	15 31	.7	0 42	3.1
45	6 10	17 24	0 29	1 37	15 21	.9	0 55	2.9
40	6 6	17 28	0 27	1 30	15 12	1.0	1 7	2.7
35	6 2	17 31	0 25	1 24	15 5	1.2	1 16	2.6
30	5 59	17 35	0 24	1 19	14 58	1.3	1 25	2.5
20	5 53	17 40	0 22	1 13	14 46	1.5	1 39	2.3
10	5 48	17 45	0 21	1 10	14 36	1.7	1 51	2.1
0	5 44	17 50	0 21	1 9	14 27	1.9	2 3	1.9
10	5 39	17 55	0 21	1 11	14 17	2.1	2 15	1.7
20	5 33	18 1	0 22	1 15	14 7	2.3	2 27	1.5
30	5 27	18 7	0 24	1 22	13 55	2.5	2 41	1.3
35	5 24	18 11	0 26	1 27	13 48	2.6	2 49	1.2
40	5 20	18 15	0 28	1 35	13 41	2.8	2 58	1.1
45	5 15	18 20	0 30	1 44	13 32	2.9	3 9	.9
50	5 9	18 26	0 33	1 58	13 21	3.2	3 21	.7
55	5 2	18 33	0 38	2 18	13 7	3.4	3 37	.4
60	4 53	18 43	0 44	2 51	12 48	3.8	3 58	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 57.5	.7	16.0	$T_{\overline{m}}$	20 38	1.9	55.9	15.2
12	13 5.4	$T_{\overline{m}_\odot}$	11 h 46.9 min	Starost	10.7 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 52	.1	133	-3.8	♃	17 43	.0	75	-2.1
♂	12 50	.1	148	1.6	♄	9 55	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 18.3	- 7 4.8	19 56.9	152 1.1	-18 32.6	167 34.4	-12 58.6
2	213 18.6	- 7 6.6	50 1.9	181 59.9	-18 34.5	197 36.1	-12 59.8
4	243 18.9	- 7 8.5	80 6.8	211 58.7	-18 36.3	227 37.7	-13 .9
6	273 19.2	- 7 10.4	110 11.7	241 57.5	-18 38.2	257 39.4	-13 2.1
8	303 19.6	- 7 12.3	140 16.7	271 56.4	-18 40.0	287 41.0	-13 3.3
10	333 19.9	- 7 14.2	170 21.6	301 55.2	-18 41.9	317 42.7	-13 4.5
12	3 20.2	- 7 16.0	200 26.5	331 54.0	-18 43.7	347 44.3	-13 5.7
14	33 20.5	- 7 17.9	230 31.4	1 52.8	-18 45.6	17 46.0	-13 6.9
16	63 20.8	- 7 19.8	260 36.4	31 51.6	-18 47.4	47 47.6	-13 8.1
18	93 21.1	- 7 21.7	290 41.3	61 50.4	-18 49.3	77 49.2	-13 9.3
20	123 21.5	- 7 23.6	320 46.2	91 49.2	-18 51.1	107 50.9	-13 10.5
22	153 21.8	- 7 25.4	350 51.2	121 48.0	-18 52.9	137 52.5	-13 11.6
Δ	2	-9		-6	-9	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	49 1.9	136	-10 43.8	139	94 29.6	-23 .9	211 46.3	6 57.5
2	78 7.2	136	-10 16.0	141	124 34.0	-23 .9	241 50.7	6 57.3
4	107 12.4	136	- 9 47.8	142	154 38.4	-23 .8	271 55.1	6 57.1
6	136 17.7	136	- 9 19.5	143	184 42.8	-23 .8	301 59.5	6 56.9
8	165 23.0	136	- 8 50.8	144	214 47.1	-23 .7	332 3.9	6 56.7
10	194 28.2	136	- 8 22.0	145	244 51.5	-23 .7	2 8.3	6 56.4
12	223 33.5	136	- 7 52.9	146	274 55.9	-23 .6	32 12.7	6 56.2
14	252 38.8	136	- 7 23.7	147	305 .3	-23 .6	62 17.1	6 56.0
16	281 44.0	136	- 6 54.2	148	335 4.7	-23 .5	92 21.5	6 55.8
18	310 49.2	136	- 6 24.5	149	5 9.1	-23 .5	122 25.9	6 55.6
20	339 54.4	136	- 5 54.6	150	35 13.4	-23 .4	152 30.3	6 55.4
22	8 59.5	135	- 5 24.5	151	65 17.8	-23 .4	182 34.7	6 55.2
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 30	17 2	0 42	2 19	16 2	.1	1 32	3.8
55	6 22	17 10	0 36	2 0	15 54	.4	1 46	3.5
50	6 16	17 17	0 32	1 47	15 47	.6	1 57	3.2
45	6 11	17 22	0 29	1 37	15 41	.8	2 5	3.0
40	6 7	17 26	0 27	1 30	15 37	1.0	2 13	2.8
35	6 3	17 30	0 25	1 24	15 33	1.1	2 19	2.6
30	5 60	17 33	0 24	1 19	15 29	1.3	2 24	2.5
20	5 54	17 39	0 22	1 13	15 23	1.5	2 33	2.3
10	5 48	17 45	0 21	1 10	15 17	1.7	2 41	2.1
0	5 43	17 50	0 21	1 9	15 12	1.9	2 49	1.9
10	5 38	17 55	0 21	1 11	15 7	2.1	2 56	1.7
20	5 33	18 1	0 22	1 15	15 1	2.3	3 4	1.5
30	5 26	18 8	0 24	1 22	14 55	2.5	3 13	1.3
35	5 22	18 11	0 26	1 28	14 51	2.7	3 18	1.1
40	5 18	18 16	0 28	1 35	14 47	2.8	3 23	1.0
45	5 13	18 21	0 30	1 45	14 42	3.0	3 30	.8
50	5 7	18 27	0 33	1 58	14 36	3.2	3 38	.6
55	4 59	18 35	0 38	2 19	14 29	3.5	3 48	.4
60	4 50	18 45	0 44	2 54	14 20	3.9	4 0	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 13.3	.6	16.0	$T_{\overline{m}}$	21 23	1.9	56.7	15.4
12	13 20.9	$T_{\overline{m}_\odot}$	11 h 46.7 min	Starost 11.7 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 52	.1	132	-3.8	♃	17 39	.0	75	-2.1
♂	12 49	.1	148	1.6	♄	9 51	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 22.1	- 7 27.3	20 56.1	151 46.8	-18 54.8	167 54.2	-13 12.8
2	213 22.4	- 7 29.2	51 1.0	181 45.6	-18 56.6	197 55.8	-13 14.0
4	243 22.7	- 7 31.1	81 5.9	211 44.4	-18 58.4	227 57.4	-13 15.2
6	273 23.0	- 7 32.9	111 10.9	241 43.2	-19 .2	257 59.1	-13 16.4
8	303 23.3	- 7 34.8	141 15.8	271 42.0	-19 2.0	288 .7	-13 17.6
10	333 23.6	- 7 36.7	171 20.7	301 40.8	-19 3.8	318 2.4	-13 18.7
12	3 24.0	- 7 38.5	201 25.7	331 39.5	-19 5.6	348 4.0	-13 19.9
14	33 24.3	- 7 40.4	231 30.6	1 38.3	-19 7.4	18 5.6	-13 21.1
16	63 24.6	- 7 42.3	261 35.5	31 37.1	-19 9.2	48 7.3	-13 22.3
18	93 24.9	- 7 44.2	291 40.4	61 35.9	-19 11.0	78 8.9	-13 23.5
20	123 25.2	- 7 46.0	321 45.4	91 34.7	-19 12.8	108 10.5	-13 24.7
22	153 25.5	- 7 47.9	351 50.3	121 33.4	-19 14.6	138 12.2	-13 25.8
Δ	2	-9		-6	-9	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	38 4.5	135	- 4 54.3	152	95 22.2	-23 .3	212 39.1	6 55.0
2	67 9.5	135	- 4 23.9	153	125 26.6	-23 .3	242 43.5	6 54.8
4	96 14.4	134	- 3 53.3	154	155 31.0	-23 .2	272 47.9	6 54.6
6	125 19.3	134	- 3 22.6	154	185 35.3	-23 .2	302 52.3	6 54.4
8	154 24.0	133	- 2 51.8	155	215 39.7	-23 .1	332 56.7	6 54.1
10	183 28.7	133	- 2 20.8	155	245 44.1	-23 .1	3 1.1	6 53.9
12	212 33.2	132	- 1 49.7	156	275 48.5	-23 .0	33 5.5	6 53.7
14	241 37.6	131	- 1 18.5	157	305 52.8	-22 60.0	63 9.9	6 53.5
16	270 41.9	131	- 0 47.2	157	335 57.2	-22 59.9	93 14.3	6 53.3
18	299 46.1	130	- 0 15.8	157	6 1.6	-22 59.9	123 18.7	6 53.1
20	328 50.1	129	0 15.7	158	36 5.9	-22 59.8	153 23.1	6 52.9
22	357 54.0	129	0 47.2	158	66 10.3	-22 59.8	183 27.5	6 52.7
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 33	16 59	0 42	2 19	16 3	.1	3 4	3.9
55	6 24	17 8	0 36	2 0	16 2	.4	3 9	3.5
50	6 18	17 14	0 32	1 47	16 2	.6	3 13	3.3
45	6 12	17 20	0 29	1 37	16 1	.8	3 17	3.1
40	6 8	17 25	0 27	1 30	16 0	1.0	3 20	2.9
35	6 4	17 29	0 25	1 24	16 0	1.2	3 22	2.7
30	6 0	17 32	0 24	1 19	15 60	1.3	3 24	2.6
20	5 54	17 39	0 22	1 13	15 59	1.6	3 28	2.3
10	5 48	17 44	0 21	1 10	15 58	1.8	3 31	2.1
0	5 43	17 50	0 21	1 9	15 58	2.0	3 34	1.9
10	5 38	17 55	0 21	1 11	15 57	2.2	3 37	1.7
20	5 32	18 1	0 22	1 15	15 56	2.4	3 40	1.5
30	5 25	18 8	0 24	1 22	15 56	2.6	3 43	1.3
35	5 21	18 12	0 26	1 28	15 55	2.8	3 45	1.1
40	5 17	18 17	0 28	1 35	15 55	2.9	3 47	1.0
45	5 11	18 22	0 30	1 45	15 54	3.1	3 50	.8
50	5 5	18 29	0 34	1 59	15 54	3.3	3 53	.6
55	4 57	18 37	0 38	2 20	15 53	3.6	3 57	.4
60	4 47	18 48	0 45	2 56	15 52	4.0	4 1	.0
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 28.5	.6	16.1	$T_{\overline{m}}$	22 9	2.0	57.5	15.7
12	13 35.9	$T_{\overline{m}_\odot}$	11 h 46.4 min	Starost 12.7 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 53	.1	131	-3.8	♃	17 36	.0	74	-2.1
♂	12 48	.1	147	1.6	♄	9 48	.0	192	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 25.8	- 7 49.8	21 55.2	151 32.2	-19 16.4	168 13.8	-13 27.0
2	213 26.1	- 7 51.6	52 .2	181 31.0	-19 18.2	198 15.4	-13 28.2
4	243 26.4	- 7 53.5	82 5.1	211 29.7	-19 20.0	228 17.1	-13 29.4
6	273 26.7	- 7 55.4	112 10.0	241 28.5	-19 21.7	258 18.7	-13 30.5
8	303 27.0	- 7 57.2	142 14.9	271 27.3	-19 23.5	288 20.3	-13 31.7
10	333 27.3	- 7 59.1	172 19.9	301 26.0	-19 25.3	318 21.9	-13 32.9
12	3 27.6	- 8 .9	202 24.8	331 24.8	-19 27.1	348 23.6	-13 34.1
14	33 27.9	- 8 2.8	232 29.7	1 23.6	-19 28.8	18 25.2	-13 35.2
16	63 28.2	- 8 4.7	262 34.6	31 22.3	-19 30.6	48 26.8	-13 36.4
18	93 28.5	- 8 6.5	292 39.6	61 21.1	-19 32.3	78 28.4	-13 37.6
20	123 28.8	- 8 8.4	322 44.5	91 19.8	-19 34.1	108 30.1	-13 38.8
22	153 29.1	- 8 10.2	352 49.4	121 18.6	-19 35.8	138 31.7	-13 39.9
Δ	1	-9		-6	-9	8	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	26 57.7	128	1 18.8	158	96 14.7	-22 59.7	213 31.9	6 52.5
2	56 1.2	127	1 50.5	158	126 19.0	-22 59.7	243 36.3	6 52.3
4	85 4.6	126	2 22.2	159	156 23.4	-22 59.6	273 40.7	6 52.1
6	114 7.7	125	2 53.9	159	186 27.7	-22 59.6	303 45.1	6 51.9
8	143 10.7	124	3 25.6	159	216 32.1	-22 59.5	333 49.5	6 51.7
10	172 13.4	123	3 57.4	159	246 36.5	-22 59.5	3 53.9	6 51.5
12	201 15.9	121	4 29.1	159	276 40.8	-22 59.4	33 58.4	6 51.2
14	230 18.2	120	5 .8	158	306 45.2	-22 59.4	64 2.8	6 51.0
16	259 20.3	119	5 32.5	158	336 49.5	-22 59.3	94 7.2	6 50.8
18	288 22.1	118	6 4.1	158	6 53.9	-22 59.2	124 11.6	6 50.6
20	317 23.6	116	6 35.7	158	36 58.2	-22 59.2	154 16.0	6 50.4
22	346 24.9	115	7 7.2	157	67 2.6	-22 59.1	184 20.4	6 50.2
Δ					22	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 35	16 56	0 42	2 19	16 5	.1	4 38	4.1
55	6 26	17 5	0 36	2 0	16 12	.4	4 35	3.7
50	6 19	17 12	0 32	1 47	16 17	.7	4 32	3.4
45	6 13	17 18	0 29	1 37	16 21	.9	4 30	3.2
40	6 9	17 23	0 27	1 30	16 25	1.1	4 28	3.0
35	6 4	17 27	0 25	1 24	16 28	1.3	4 27	2.8
30	6 1	17 31	0 24	1 20	16 31	1.4	4 26	2.7
20	5 54	17 38	0 22	1 13	16 36	1.7	4 23	2.4
10	5 48	17 44	0 21	1 10	16 40	1.9	4 22	2.2
0	5 43	17 49	0 21	1 9	16 45	2.1	4 20	2.0
10	5 37	17 55	0 21	1 11	16 49	2.3	4 18	1.8
20	5 31	18 2	0 22	1 15	16 53	2.5	4 16	1.6
30	5 24	18 9	0 24	1 22	16 59	2.7	4 14	1.4
35	5 20	18 13	0 26	1 28	17 2	2.9	4 13	1.2
40	5 15	18 18	0 28	1 35	17 5	3.0	4 11	1.1
45	5 9	18 24	0 30	1 45	17 9	3.2	4 10	.9
50	5 3	18 31	0 34	1 60	17 14	3.5	4 8	.7
55	4 54	18 39	0 38	2 21	17 20	3.8	4 6	.4
60	4 44	18 50	0 45	2 59	17 28	4.2	4 3	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	13 43.3	.6	16.1	$T_{\overline{m}}$ 22 56	2.1	58.3	15.9
12	13 50.5	$T_{\overline{m}_\odot}$ 11 h 46.2 min		Starost 13.7 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 54	.1	130	-3.8	♃	17 32	.0	74	-2.1
♂	12 46	.1	146	1.6	♄	9 44	.0	192	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 29.3	- 8 12.1	22 54.4	151 17.3	-19 37.6	168 33.3	-13 41.1
2	213 29.6	- 8 14.0	52 59.3	181 16.1	-19 39.3	198 34.9	-13 42.3
4	243 29.9	- 8 15.8	83 4.2	211 14.8	-19 41.1	228 36.5	-13 43.4
6	273 30.2	- 8 17.7	113 9.1	241 13.6	-19 42.8	258 38.2	-13 44.6
8	303 30.5	- 8 19.5	143 14.1	271 12.3	-19 44.5	288 39.8	-13 45.8
10	333 30.8	- 8 21.4	173 19.0	301 11.0	-19 46.2	318 41.4	-13 47.0
12	3 31.1	- 8 23.2	203 23.9	331 9.8	-19 48.0	348 43.0	-13 48.1
14	33 31.4	- 8 25.1	233 28.9	1 8.5	-19 49.7	18 44.6	-13 49.3
16	63 31.7	- 8 26.9	263 33.8	31 7.2	-19 51.4	48 46.2	-13 50.5
18	93 31.9	- 8 28.8	293 38.7	61 6.0	-19 53.1	78 47.8	-13 51.6
20	123 32.2	- 8 30.6	323 43.6	91 4.7	-19 54.8	108 49.4	-13 52.8
22	153 32.5	- 8 32.5	353 48.6	121 3.4	-19 56.5	138 51.1	-13 54.0
Δ	1	-9		-6	-9	8	-6

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\jupiter}$	JUPITER $\delta_{\jupiter}$	SATURN $S_{\saturn}$	SATURN $\delta_{\saturn}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	15 25.9	114	7 38.7	157	97 6.9	-22 59.1	214 24.8	6 50.0
2	44 26.6	112	8 10.0	156	127 11.3	-22 59.0	244 29.2	6 49.8
4	73 27.0	111	8 41.2	155	157 15.6	-22 59.0	274 33.6	6 49.6
6	102 27.2	109	9 12.3	155	187 20.0	-22 58.9	304 38.0	6 49.4
8	131 27.0	107	9 43.3	154	217 24.3	-22 58.9	334 42.4	6 49.2
10	160 26.5	106	10 14.1	153	247 28.7	-22 58.8	4 46.8	6 49.0
12	189 25.6	104	10 44.7	152	277 33.0	-22 58.8	34 51.2	6 48.8
14	218 24.4	102	11 15.2	151	307 37.4	-22 58.7	64 55.6	6 48.6
16	247 22.9	101	11 45.4	150	337 41.7	-22 58.7	95 .0	6 48.4
18	276 21.1	99	12 15.5	149	7 46.0	-22 58.6	125 4.5	6 48.2
20	305 18.8	97	12 45.3	148	37 50.4	-22 58.5	155 8.9	6 48.0
22	334 16.2	95	13 14.9	147	67 54.7	-22 58.5	185 13.3	6 47.8
Δ					22	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 38	16 53	0 42	2 19	16 7	.2	6 15	4.3
55	6 28	17 3	0 37	2 0	16 22	.6	6 3	3.9
50	6 21	17 10	0 33	1 47	16 34	.9	5 54	3.6
45	6 15	17 16	0 30	1 37	16 44	1.1	5 46	3.3
40	6 10	17 22	0 27	1 30	16 52	1.3	5 40	3.1
35	6 5	17 26	0 25	1 24	16 59	1.5	5 34	2.9
30	6 1	17 30	0 24	1 20	17 5	1.6	5 30	2.8
20	5 55	17 37	0 22	1 13	17 16	1.8	5 22	2.6
10	5 48	17 43	0 21	1 10	17 25	2.0	5 14	2.3
0	5 43	17 49	0 21	1 9	17 34	2.2	5 8	2.1
10	5 37	17 55	0 21	1 11	17 43	2.4	5 1	1.9
20	5 30	18 2	0 22	1 15	17 53	2.6	4 54	1.7
30	5 23	18 10	0 24	1 23	18 4	2.9	4 46	1.5
35	5 18	18 14	0 26	1 28	18 11	3.0	4 42	1.4
40	5 13	18 19	0 28	1 36	18 18	3.2	4 37	1.2
45	5 8	18 25	0 30	1 46	18 27	3.4	4 31	1.0
50	5 1	18 32	0 34	2 0	18 38	3.6	4 24	.8
55	4 52	18 41	0 38	2 22	18 51	4.0	4 15	.5
60	4 41	18 53	0 45	3 2	19 8	4.5	4 4	.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	13 57.6	.6	16.1	$T_{\overline{m}}$ 23 47	2.2	59.1	16.1
12	14 4.4	$T_{\overline{m}_\odot}$ 11 h 45.9 min		Starost 14.7 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 55	.1	128	-3.9	♃	17 29	.0	74	-2.1
♂	12 45	.1	146	1.6	♄	9 41	.0	192	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 32.8	- 8 34.3	23 53.5	151 2.2	-19 58.2	168 52.7	-13 55.1
2	213 33.1	- 8 36.2	53 58.4	181 .9	-19 59.9	198 54.3	-13 56.3
4	243 33.3	- 8 38.0	84 3.4	210 59.6	-20 1.6	228 55.9	-13 57.4
6	273 33.6	- 8 39.9	114 8.3	240 58.3	-20 3.3	258 57.5	-13 58.6
8	303 33.9	- 8 41.7	144 13.2	270 57.0	-20 5.0	288 59.1	-13 59.8
10	333 34.2	- 8 43.6	174 18.1	300 55.8	-20 6.7	319 .7	-14 .9
12	3 34.4	- 8 45.4	204 23.1	330 54.5	-20 8.4	349 2.3	-14 2.1
14	33 34.7	- 8 47.2	234 28.0	0 53.2	-20 10.1	19 3.9	-14 3.2
16	63 35.0	- 8 49.1	264 32.9	30 51.9	-20 11.7	49 5.5	-14 4.4
18	93 35.3	- 8 50.9	294 37.9	60 50.6	-20 13.4	79 7.1	-14 5.6
20	123 35.5	- 8 52.8	324 42.8	90 49.3	-20 15.1	109 8.7	-14 6.7
22	153 35.8	- 8 54.6	354 47.7	120 48.0	-20 16.7	139 10.3	-14 7.9
Δ	1	-9		-6	-8	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	3 13.3	93	13 44.2	145	97 59.0	-22 58.4	215 17.7	6 47.6
2	32 9.9	91	14 13.3	144	128 3.4	-22 58.4	245 22.1	6 47.4
4	61 6.2	89	14 42.1	142	158 7.7	-22 58.3	275 26.5	6 47.1
6	90 2.1	87	15 10.6	141	188 12.0	-22 58.3	305 30.9	6 46.9
8	118 57.6	85	15 38.7	139	218 16.4	-22 58.2	335 35.3	6 46.7
10	147 52.6	83	16 6.5	137	248 20.7	-22 58.2	5 39.7	6 46.5
12	176 47.3	81	16 34.0	136	278 25.0	-22 58.1	35 44.1	6 46.3
14	205 41.6	79	17 1.1	134	308 29.4	-22 58.0	65 48.6	6 46.1
16	234 35.4	77	17 27.8	132	338 33.7	-22 58.0	95 53.0	6 45.9
18	263 28.9	75	17 54.1	130	8 38.0	-22 57.9	125 57.4	6 45.7
20	292 21.9	73	18 20.0	127	38 42.3	-22 57.9	156 1.8	6 45.5
22	321 14.5	71	18 45.5	125	68 46.7	-22 57.8	186 6.2	6 45.3
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 40	16 50	0 42	2 19	16 11	.3	7 59	4.6
55	6 30	17 0	0 37	2 1	16 36	.8	7 36	4.0
50	6 22	17 8	0 33	1 47	16 55	1.2	7 19	3.7
45	6 16	17 15	0 30	1 38	17 11	1.4	7 5	3.4
40	6 11	17 20	0 27	1 30	17 23	1.6	6 54	3.2
35	6 6	17 25	0 25	1 24	17 34	1.7	6 45	3.1
30	6 2	17 29	0 24	1 20	17 43	1.8	6 37	2.9
20	5 55	17 36	0 22	1 13	17 60	2.1	6 23	2.7
10	5 48	17 43	0 21	1 10	18 14	2.2	6 11	2.5
0	5 42	17 49	0 21	1 10	18 28	2.4	5 59	2.3
10	5 36	17 55	0 21	1 11	18 41	2.6	5 48	2.1
20	5 29	18 2	0 22	1 15	18 56	2.8	5 36	1.9
30	5 22	18 10	0 24	1 23	19 13	3.0	5 22	1.7
35	5 17	18 15	0 26	1 28	19 23	3.1	5 14	1.6
40	5 12	18 20	0 28	1 36	19 35	3.3	5 5	1.4
45	5 6	18 26	0 30	1 46	19 48	3.4	4 55	1.2
50	4 59	18 34	0 34	2 1	20 5	3.7	4 42	1.0
55	4 50	18 43	0 39	2 23	20 26	4.1	4 27	.7
60	4 38	18 55	0 46	3 5	20 56	4.7	4 7	.2
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	14 11.3	.5	16.1	$T_{\overline{m}}$	. . .	1.0	59.7	16.3
12	14 17.9	$T_{\overline{m}_\odot}$	11 h 45.7 min	Starost 15.7 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 56	.1	127	-3.9	♄	17 26	.0	74	-2.1
♂	12 44	.1	145	1.6	♃	9 37	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 36.1	- 8 56.4	24 52.6	150 46.7	-20 18.4	169 11.9	-14 9.0
2	213 36.3	- 8 58.3	54 57.6	180 45.4	-20 20.0	199 13.5	-14 10.2
4	243 36.6	- 9 .1	85 2.5	210 44.1	-20 21.7	229 15.1	-14 11.3
6	273 36.9	- 9 2.0	115 7.4	240 42.8	-20 23.3	259 16.7	-14 12.5
8	303 37.1	- 9 3.8	145 12.4	270 41.5	-20 25.0	289 18.3	-14 13.7
10	333 37.4	- 9 5.6	175 17.3	300 40.2	-20 26.6	319 19.9	-14 14.8
12	3 37.7	- 9 7.5	205 22.2	330 38.9	-20 28.3	349 21.5	-14 16.0
14	33 37.9	- 9 9.3	235 27.1	0 37.5	-20 29.9	19 23.1	-14 17.1
16	63 38.2	- 9 11.1	265 32.1	30 36.2	-20 31.5	49 24.6	-14 18.3
18	93 38.4	- 9 12.9	295 37.0	60 34.9	-20 33.2	79 26.2	-14 19.4
20	123 38.7	- 9 14.8	325 41.9	90 33.6	-20 34.8	109 27.8	-14 20.6
22	153 39.0	- 9 16.6	355 46.9	120 32.3	-20 36.4	139 29.4	-14 21.7
Δ	1	-9		-7	-8	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	350 6.7	69	19 10.5	123	98 51.0	-22 57.8	216 10.6	6 45.1
2	18 58.4	67	19 35.1	120	128 55.3	-22 57.7	246 15.0	6 44.9
4	47 49.8	65	19 59.1	118	158 59.6	-22 57.6	276 19.5	6 44.7
6	76 40.7	63	20 22.7	115	189 4.0	-22 57.6	306 23.9	6 44.5
8	105 31.2	60	20 45.8	113	219 8.3	-22 57.5	336 28.3	6 44.3
10	134 21.3	58	21 8.3	110	249 12.6	-22 57.5	6 32.7	6 44.1
12	163 11.0	56	21 30.3	107	279 16.9	-22 57.4	36 37.1	6 43.9
14	192 .3	54	21 51.8	104	309 21.2	-22 57.3	66 41.5	6 43.7
16	220 49.2	52	22 12.7	101	339 25.5	-22 57.3	96 45.9	6 43.5
18	249 37.7	51	22 32.9	98	9 29.8	-22 57.2	126 50.4	6 43.3
20	278 25.8	49	22 52.6	95	39 34.2	-22 57.2	156 54.8	6 43.1
22	307 13.5	47	23 11.7	92	69 38.5	-22 57.1	186 59.2	6 42.9
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 43	16 47	0 42	2 19	16 18	.7	9 48	4.6
55	6 32	16 58	0 37	2 1	16 56	1.3	9 12	4.0
50	6 24	17 6	0 33	1 47	17 23	1.6	8 47	3.6
45	6 17	17 13	0 30	1 38	17 44	1.8	8 28	3.4
40	6 12	17 19	0 27	1 30	18 1	1.9	8 12	3.2
35	6 7	17 24	0 26	1 24	18 15	2.1	7 59	3.1
30	6 3	17 28	0 24	1 20	18 28	2.2	7 47	3.0
20	5 55	17 36	0 22	1 14	18 49	2.3	7 27	2.8
10	5 49	17 42	0 21	1 10	19 8	2.5	7 11	2.6
0	5 42	17 49	0 21	1 10	19 26	2.6	6 55	2.5
10	5 36	17 55	0 21	1 11	19 43	2.7	6 39	2.3
20	5 29	18 3	0 22	1 15	20 2	2.8	6 22	2.2
30	5 21	18 11	0 24	1 23	20 25	3.0	6 3	2.0
35	5 16	18 16	0 26	1 29	20 38	3.1	5 52	1.9
40	5 10	18 21	0 28	1 36	20 53	3.2	5 39	1.7
45	5 4	18 28	0 31	1 47	21 11	3.3	5 24	1.6
50	4 57	18 35	0 34	2 2	21 33	3.5	5 6	1.3
55	4 47	18 45	0 39	2 25	22 3	3.8	4 43	1.0
60	4 35	18 58	0 46	3 9	22 48	4.5	4 11	.4
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	14 24.5	.5	16.1	$T_{\overline{m}}$	0 41	2.5	60.1	16.4
12	14 30.7	$T_{\overline{m}_\odot}$	11 h 45.5 min	Starost 16.7 d		Faza ❍		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	13 57	.1	126	-3.9	♄	17 22	.0	74	-2.1
♂	12 43	.1	144	1.6	♃	9 34	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 39.2	- 9 18.4	25 51.8	150 31.0	-20 38.0	169 31.0	-14 22.9
2	213 39.5	- 9 20.3	55 56.7	180 29.6	-20 39.6	199 32.6	-14 24.0
4	243 39.7	- 9 22.1	86 1.6	210 28.3	-20 41.2	229 34.2	-14 25.2
6	273 40.0	- 9 23.9	116 6.6	240 27.0	-20 42.8	259 35.8	-14 26.3
8	303 40.2	- 9 25.7	146 11.5	270 25.6	-20 44.4	289 37.3	-14 27.4
10	333 40.5	- 9 27.5	176 16.4	300 24.3	-20 46.0	319 38.9	-14 28.6
12	3 40.7	- 9 29.4	206 21.3	330 23.0	-20 47.6	349 40.5	-14 29.7
14	33 41.0	- 9 31.2	236 26.3	0 21.6	-20 49.2	19 42.1	-14 30.9
16	63 41.2	- 9 33.0	266 31.2	30 20.3	-20 50.8	49 43.7	-14 32.0
18	93 41.5	- 9 34.8	296 36.1	60 19.0	-20 52.4	79 45.2	-14 33.2
20	123 41.7	- 9 36.6	326 41.1	90 17.6	-20 54.0	109 46.8	-14 34.3
22	153 42.0	- 9 38.5	356 46.0	120 16.3	-20 55.5	139 48.4	-14 35.4
Δ	1	-9		-7	-8	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	336 .9	45	23 30.1	89	99 42.8	-22 57.0	217 3.6	6 42.7
2	4 47.9	43	23 47.9	86	129 47.1	-22 57.0	247 8.0	6 42.5
4	33 34.5	42	24 5.0	82	159 51.4	-22 56.9	277 12.4	6 42.3
6	62 20.9	40	24 21.5	79	189 55.7	-22 56.9	307 16.9	6 42.1
8	91 6.9	38	24 37.3	75	219 60.0	-22 56.8	337 21.3	6 41.9
10	119 52.5	37	24 52.4	72	250 4.3	-22 56.7	7 25.7	6 41.7
12	148 37.9	35	25 6.8	68	280 8.6	-22 56.7	37 30.1	6 41.5
14	177 23.0	34	25 20.4	65	310 12.9	-22 56.6	67 34.5	6 41.3
16	206 7.8	33	25 33.4	61	340 17.2	-22 56.6	97 38.9	6 41.1
18	234 52.4	32	25 45.6	57	10 21.5	-22 56.5	127 43.4	6 40.9
20	263 36.8	31	25 57.0	54	40 25.8	-22 56.4	157 47.8	6 40.7
22	292 20.9	30	26 7.7	50	70 30.1	-22 56.4	187 52.2	6 40.5
Δ					22	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 45	16 44	0 42	2 19	16 35	1.5	11 39	4.0
55	6 34	16 56	0 37	2 1	17 27	2.0	10 48	3.5
50	6 26	17 4	0 33	1 47	18 1	2.2	10 14	3.3
45	6 19	17 11	0 30	1 38	18 27	2.3	9 49	3.2
40	6 13	17 17	0 27	1 30	18 48	2.4	9 30	3.1
35	6 8	17 22	0 26	1 24	19 5	2.4	9 13	3.0
30	6 3	17 27	0 24	1 20	19 20	2.5	8 59	2.9
20	5 56	17 35	0 22	1 14	19 45	2.6	8 35	2.8
10	5 49	17 42	0 21	1 10	20 7	2.6	8 14	2.7
0	5 42	17 49	0 21	1 10	20 27	2.7	7 55	2.6
10	5 35	17 55	0 21	1 11	20 48	2.7	7 35	2.5
20	5 28	18 3	0 22	1 15	21 10	2.8	7 15	2.4
30	5 20	18 12	0 25	1 23	21 36	2.8	6 51	2.3
35	5 15	18 17	0 26	1 29	21 51	2.9	6 37	2.3
40	5 9	18 22	0 28	1 37	22 9	2.9	6 21	2.2
45	5 2	18 29	0 31	1 47	22 31	2.9	6 2	2.0
50	4 55	18 37	0 34	2 3	22 58	3.0	5 38	1.9
55	4 45	18 47	0 39	2 26	23 35	3.1	5 7	1.6
60	4 32	19 0	0 46	3 13	. . .	.0	4 21	.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	14 37.0	.5	16.1	$T_{\overline{m}}$ 1 40	2.6	60.3	16.4
12	14 43.0	$T_{\overline{m}_\odot}$ 11 h 45.3 min		Starost 17.7 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 59	.1	125	-3.9	♃	17 19	.0	74	-2.1
♂	12 41	.1	144	1.6	♄	9 30	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 42.2	- 9 40.3	26 50.9	150 14.9	-20 57.1	169 50.0	-14 36.6
2	213 42.4	- 9 42.1	56 55.8	180 13.6	-20 58.7	199 51.5	-14 37.7
4	243 42.7	- 9 43.9	87 .8	210 12.2	-21 .2	229 53.1	-14 38.9
6	273 42.9	- 9 45.7	117 5.7	240 10.9	-21 1.8	259 54.7	-14 40.0
8	303 43.2	- 9 47.5	147 10.6	270 9.5	-21 3.4	289 56.3	-14 41.1
10	333 43.4	- 9 49.3	177 15.6	300 8.1	-21 4.9	319 57.8	-14 42.3
12	3 43.6	- 9 51.2	207 20.5	330 6.8	-21 6.5	349 59.4	-14 43.4
14	33 43.9	- 9 53.0	237 25.4	0 5.4	-21 8.0	20 1.0	-14 44.6
16	63 44.1	- 9 54.8	267 30.3	30 4.1	-21 9.5	50 2.5	-14 45.7
18	93 44.3	- 9 56.6	297 35.3	60 2.7	-21 11.1	80 4.1	-14 46.8
20	123 44.6	- 9 58.4	327 40.2	90 1.3	-21 12.6	110 5.7	-14 48.0
22	153 44.8	-10 .2	357 45.1	119 60.0	-21 14.1	140 7.2	-14 49.1
Δ	1	-9		-7	-8	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	321 4.9	29	26 17.7	46	100 34.4	-22 56.3	217 56.6	6 40.3
2	349 48.6	28	26 26.9	42	130 38.7	-22 56.3	248 1.1	6 40.1
4	18 32.2	27	26 35.3	38	160 43.0	-22 56.2	278 5.5	6 39.9
6	47 15.7	27	26 42.9	34	190 47.3	-22 56.1	308 9.9	6 39.7
8	75 59.1	26	26 49.8	30	220 51.6	-22 56.1	338 14.3	6 39.5
10	104 42.3	26	26 55.9	26	250 55.9	-22 56.0	8 18.7	6 39.3
12	133 25.5	26	27 1.1	22	281 .1	-22 56.0	38 23.2	6 39.1
14	162 8.7	26	27 5.6	18	311 4.4	-22 55.9	68 27.6	6 38.9
16	190 51.8	26	27 9.3	15	341 8.7	-22 55.8	98 32.0	6 38.7
18	219 34.9	26	27 12.2	11	11 13.0	-22 55.8	128 36.4	6 38.5
20	248 18.0	26	27 14.3	7	41 17.3	-22 55.7	158 40.9	6 38.3
22	277 1.2	26	27 15.6	3	71 21.6	-22 55.6	188 45.3	6 38.1
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 48	16 42	0 43	2 19	17 11	3.0	13 15	2.6
55	6 36	16 53	0 37	2 1	18 15	2.9	12 12	2.7
50	6 27	17 2	0 33	1 48	18 54	2.8	11 33	2.7
45	6 20	17 10	0 30	1 38	19 23	2.8	11 5	2.7
40	6 14	17 16	0 27	1 30	19 45	2.8	10 43	2.7
35	6 9	17 21	0 26	1 24	20 3	2.8	10 25	2.7
30	6 4	17 26	0 24	1 20	20 19	2.7	10 9	2.7
20	5 56	17 34	0 22	1 14	20 46	2.7	9 42	2.7
10	5 49	17 41	0 21	1 10	21 10	2.7	9 19	2.7
0	5 42	17 48	0 21	1 10	21 31	2.6	8 58	2.7
10	5 35	17 56	0 21	1 11	21 53	2.6	8 36	2.7
20	5 27	18 3	0 22	1 16	22 17	2.6	8 13	2.6
30	5 18	18 12	0 25	1 23	22 44	2.5	7 47	2.6
35	5 13	18 17	0 26	1 29	23 0	2.5	7 31	2.6
40	5 8	18 23	0 28	1 37	23 19	2.4	7 13	2.6
45	5 1	18 30	0 31	1 48	23 42	2.4	6 51	2.6
50	4 53	18 39	0 34	2 3	. . .	.0	6 23	2.5
55	4 42	18 49	0 39	2 28	. . .	.0	5 45	2.4
60	4 29	19 3	0 47	3 18	0 37	3.4	4 44	2.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	14 49.0	.5	16.1	$T_{\overline{m}}$ 2 43	2.7	60.2	16.4
12	14 54.7	$T_{\overline{m}_\odot}$ 11 h 45.1 min		Starost 18.7 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	13 60	.1	123	-3.9	♃	17 15	.0	74	-2.1
♂	12 40	.1	143	1.6	♄	9 27	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 45.0	-10 2.0	27 50.1	149 58.6	-21 15.7	170 8.8	-14 50.2
2	213 45.3	-10 3.8	57 55.0	179 57.2	-21 17.2	200 10.4	-14 51.4
4	243 45.5	-10 5.6	87 59.9	209 55.8	-21 18.7	230 11.9	-14 52.5
6	273 45.7	-10 7.4	118 4.8	239 54.5	-21 20.2	260 13.5	-14 53.6
8	303 45.9	-10 9.2	148 9.8	269 53.1	-21 21.7	290 15.0	-14 54.7
10	333 46.2	-10 11.0	178 14.7	299 51.7	-21 23.2	320 16.6	-14 55.9
12	3 46.4	-10 12.8	208 19.6	329 50.3	-21 24.7	350 18.1	-14 57.0
14	33 46.6	-10 14.6	238 24.6	359 48.9	-21 26.2	20 19.7	-14 58.1
16	63 46.8	-10 16.4	268 29.5	29 47.6	-21 27.7	50 21.3	-14 59.3
18	93 47.1	-10 18.2	298 34.4	59 46.2	-21 29.2	80 22.8	-15 .4
20	123 47.3	-10 20.0	328 39.3	89 44.8	-21 30.7	110 24.4	-15 1.5
22	153 47.5	-10 21.8	358 44.3	119 43.4	-21 32.2	140 25.9	-15 2.6
Δ	1	-9		-7	-7	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	305 44.4	27	27 16.1	-1	101 25.8	-22 55.6	218 49.7	6 37.9
2	334 27.7	27	27 15.9	-5	131 30.1	-22 55.5	248 54.1	6 37.7
4	3 11.1	28	27 14.8	-9	161 34.4	-22 55.4	278 58.6	6 37.5
6	31 54.7	28	27 13.0	-13	191 38.7	-22 55.4	309 3.0	6 37.3
8	60 38.4	29	27 10.3	-17	221 43.0	-22 55.3	339 7.4	6 37.1
10	89 22.2	30	27 6.9	-21	251 47.2	-22 55.3	9 11.8	6 36.9
12	118 6.3	31	27 2.7	-25	281 51.5	-22 55.2	39 16.3	6 36.7
14	146 50.5	32	26 57.8	-28	311 55.8	-22 55.1	69 20.7	6 36.5
16	175 35.0	34	26 52.1	-32	342 .1	-22 55.1	99 25.1	6 36.3
18	204 19.8	35	26 45.7	-36	12 4.3	-22 55.0	129 29.5	6 36.1
20	233 4.8	36	26 38.5	-40	42 8.6	-22 54.9	159 34.0	6 35.9
22	261 50.0	38	26 30.6	-43	72 12.9	-22 54.9	189 38.4	6 35.8
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 50	16 39	0 43	2 19	18 23	4.1	14 17	1.2
55	6 38	16 51	0 37	2 1	19 25	3.5	13 16	1.7
50	6 29	17 0	0 33	1 48	20 2	3.3	12 37	2.0
45	6 21	17 8	0 30	1 38	20 30	3.1	12 10	2.1
40	6 15	17 14	0 27	1 30	20 52	3.0	11 48	2.2
35	6 10	17 20	0 26	1 24	21 10	2.9	11 29	2.3
30	6 5	17 25	0 24	1 20	21 25	2.8	11 13	2.3
20	5 56	17 33	0 22	1 14	21 51	2.7	10 47	2.4
10	5 49	17 41	0 21	1 11	22 14	2.6	10 23	2.5
0	5 42	17 48	0 21	1 10	22 35	2.5	10 2	2.6
10	5 34	17 56	0 21	1 11	22 56	2.4	9 40	2.7
20	5 26	18 4	0 23	1 16	23 18	2.3	9 17	2.7
30	5 17	18 13	0 25	1 24	23 44	2.2	8 50	2.8
35	5 12	18 18	0 26	1 29	23 60	2.1	8 34	2.9
40	5 6	18 24	0 28	1 37	. . .	.0	8 15	2.9
45	4 59	18 32	0 31	1 48	. . .	.0	7 52	3.0
50	4 50	18 40	0 34	2 4	0 11	2.3	7 24	3.1
55	4 40	18 51	0 39	2 29	0 51	2.2	6 43	3.3
60	4 26	19 6	0 47	3 23	1 58	1.8	5 36	3.7
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 .3	.4	16.1	$T_{\overline{m}}$	3 47	2.6	60.0	16.3
12	15 5.7	$T_{\overline{m}_\odot}$	11 h 44.9 min	Starost 19.7 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 1	.1	122	-3.9	♄	17 12	.0	74	-2.0
♂	12 39	.1	142	1.6	♇	9 23	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 47.7	-10 23.6	28 49.2	149 42.0	-21 33.6	170 27.5	-15 3.8
2	213 47.9	-10 25.4	58 54.1	179 40.6	-21 35.1	200 29.0	-15 4.9
4	243 48.1	-10 27.1	88 59.1	209 39.2	-21 36.6	230 30.6	-15 6.0
6	273 48.3	-10 28.9	119 4.0	239 37.8	-21 38.0	260 32.1	-15 7.1
8	303 48.6	-10 30.7	149 8.9	269 36.4	-21 39.5	290 33.7	-15 8.2
10	333 48.8	-10 32.5	179 13.8	299 35.0	-21 41.0	320 35.2	-15 9.4
12	3 49.0	-10 34.3	209 18.8	329 33.6	-21 42.4	350 36.8	-15 10.5
14	33 49.2	-10 36.1	239 23.7	359 32.2	-21 43.9	20 38.3	-15 11.6
16	63 49.4	-10 37.9	269 28.6	29 30.8	-21 45.3	50 39.9	-15 12.7
18	93 49.6	-10 39.6	299 33.5	59 29.3	-21 46.8	80 41.4	-15 13.8
20	123 49.8	-10 41.4	329 38.5	89 27.9	-21 48.2	110 42.9	-15 15.0
22	153 50.0	-10 43.2	359 43.4	119 26.5	-21 49.6	140 44.5	-15 16.1
Δ	1	-9		-7	-7	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	290 35.6	39	26 21.9	-47	102 17.1	-22 54.8	219 42.8	6 35.6
2	319 21.5	41	26 12.6	-50	132 21.4	-22 54.7	249 47.2	6 35.4
4	348 7.8	43	26 2.5	-54	162 25.7	-22 54.7	279 51.7	6 35.2
6	16 54.3	45	25 51.7	-57	192 29.9	-22 54.6	309 56.1	6 35.0
8	45 41.2	46	25 40.3	-61	222 34.2	-22 54.5	340 .5	6 34.8
10	74 28.5	48	25 28.2	-64	252 38.5	-22 54.5	10 5.0	6 34.6
12	103 16.2	50	25 15.4	-67	282 42.7	-22 54.4	40 9.4	6 34.4
14	132 4.3	52	25 2.0	-70	312 47.0	-22 54.3	70 13.8	6 34.2
16	160 52.7	54	24 48.0	-73	342 51.3	-22 54.3	100 18.3	6 34.0
18	189 41.6	56	24 33.3	-76	12 55.5	-22 54.2	130 22.7	6 33.8
20	218 30.9	59	24 18.0	-79	42 59.8	-22 54.1	160 27.1	6 33.6
22	247 20.6	61	24 2.1	-82	73 4.0	-22 54.1	190 31.5	6 33.4
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 53	16 36	0 43	2 19	20 2	4.4	14 46	.5
55	6 40	16 49	0 37	2 1	20 50	3.8	13 57	1.1
50	6 30	16 58	0 33	1 48	21 21	3.4	13 25	1.4
45	6 23	17 6	0 30	1 38	21 45	3.2	13 0	1.6
40	6 16	17 13	0 27	1 30	22 4	3.1	12 41	1.8
35	6 10	17 19	0 26	1 24	22 20	2.9	12 24	1.9
30	6 5	17 24	0 24	1 20	22 33	2.8	12 10	2.0
20	5 57	17 33	0 22	1 14	22 56	2.6	11 45	2.2
10	5 49	17 41	0 21	1 11	23 16	2.5	11 24	2.3
0	5 41	17 48	0 21	1 10	23 35	2.3	11 4	2.4
10	5 34	17 56	0 21	1 12	23 54	2.2	10 44	2.5
20	5 26	18 4	0 23	1 16	. . .	.0	10 22	2.7
30	5 16	18 14	0 25	1 24	. . .	.0	9 57	2.8
35	5 11	18 19	0 26	1 30	. . .	.0	9 42	2.9
40	5 5	18 26	0 28	1 38	0 18	2.0	9 25	3.1
45	4 57	18 33	0 31	1 49	0 39	1.8	9 4	3.2
50	4 48	18 42	0 35	2 5	1 6	1.7	8 38	3.4
55	4 37	18 53	0 40	2 31	1 43	1.4	8 2	3.7
60	4 23	19 8	0 47	3 29	2 40	.7	7 6	4.4
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 11.0	.4	16.1	$T_{\overline{m}}$	4 50	2.5	59.6	16.2
12	15 16.0	$T_{\overline{m}_\odot}$	11 h 44.7 min	Starost 20.7 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 2	.1	121	-3.9	♄	17 8	.0	73	-2.0
♂	12 38	.1	142	1.6	♇	9 20	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 50.2	-10 45.0	29 48.3	149 25.1	-21 51.1	170 46.0	-15 17.2
2	213 50.4	-10 46.8	59 53.3	179 23.7	-21 52.5	200 47.6	-15 18.3
4	243 50.6	-10 48.5	89 58.2	209 22.3	-21 53.9	230 49.1	-15 19.4
6	273 50.8	-10 50.3	120 3.1	239 20.8	-21 55.3	260 50.6	-15 20.5
8	303 51.0	-10 52.1	150 8.0	269 19.4	-21 56.7	290 52.2	-15 21.6
10	333 51.2	-10 53.9	180 13.0	299 18.0	-21 58.1	320 53.7	-15 22.7
12	3 51.4	-10 55.6	210 17.9	329 16.6	-21 59.5	350 55.2	-15 23.9
14	33 51.6	-10 57.4	240 22.8	359 15.1	-22 .9	20 56.8	-15 25.0
16	63 51.8	-10 59.2	270 27.8	29 13.7	-22 2.3	50 58.3	-15 26.1
18	93 52.0	-11 .9	300 32.7	59 12.3	-22 3.7	80 59.8	-15 27.2
20	123 52.2	-11 2.7	330 37.6	89 10.8	-22 5.1	111 1.4	-15 28.3
22	153 52.4	-11 4.5	0 42.5	119 9.4	-22 6.5	141 2.9	-15 29.4
Δ	1	-9		-7	-7	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	276 10.7	63	23 45.7	-85	103 8.3	-22 54.0	220 36.0	6 33.2
2	305 1.3	65	23 28.6	-88	133 12.5	-22 53.9	250 40.4	6 33.0
4	333 52.3	67	23 11.0	-91	163 16.8	-22 53.9	280 44.8	6 32.8
6	2 43.8	69	22 52.9	-93	193 21.0	-22 53.8	310 49.3	6 32.6
8	31 35.7	72	22 34.2	-96	223 25.3	-22 53.7	340 53.7	6 32.4
10	60 28.0	74	22 15.0	-98	253 29.5	-22 53.7	10 58.1	6 32.2
12	89 20.8	76	21 55.3	-101	283 33.8	-22 53.6	41 2.6	6 32.1
14	118 14.1	78	21 35.2	-103	313 38.0	-22 53.5	71 7.0	6 31.9
16	147 7.8	81	21 14.5	-106	343 42.3	-22 53.5	101 11.4	6 31.7
18	176 1.9	83	20 53.4	-108	13 46.5	-22 53.4	131 15.9	6 31.5
20	204 56.5	85	20 31.8	-110	43 50.8	-22 53.3	161 20.3	6 31.3
22	233 51.5	87	20 9.8	-112	73 55.0	-22 53.3	191 24.8	6 31.1
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 55	16 33	0 43	2 19	21 47	4.2	14 58	.3
55	6 42	16 46	0 37	2 1	22 20	3.7	14 24	.7
50	6 32	16 56	0 33	1 48	22 44	3.4	13 58	1.0
45	6 24	17 5	0 30	1 38	23 2	3.2	13 39	1.2
40	6 17	17 11	0 28	1 30	23 17	3.0	13 23	1.4
35	6 11	17 17	0 26	1 25	23 30	2.8	13 9	1.6
30	6 6	17 23	0 24	1 20	23 41	2.7	12 57	1.7
20	5 57	17 32	0 22	1 14	23 59	2.5	12 37	1.9
10	5 49	17 40	0 21	1 11	. . .	.0	12 19	2.1
0	5 41	17 48	0 21	1 10	. . .	.0	12 2	2.2
10	5 33	17 56	0 21	1 12	. . .	.0	11 45	2.4
20	5 25	18 4	0 23	1 16	0 13	2.0	11 27	2.6
30	5 15	18 14	0 25	1 24	0 36	1.8	11 6	2.8
35	5 10	18 20	0 26	1 30	0 49	1.7	10 53	2.9
40	5 3	18 27	0 28	1 38	1 5	1.6	10 39	3.0
45	4 56	18 34	0 31	1 49	1 23	1.4	10 22	3.2
50	4 47	18 44	0 35	2 6	1 46	1.2	10 0	3.5
55	4 35	18 55	0 40	2 33	2 15	.9	9 32	3.8
60	4 20	19 11	0 48	3 37	2 58	.3	8 51	4.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 21.0	.4	16.1	$T_{\overline{m}}$ 5 49	2.3	59.1	16.1
12	15 25.7	$T_{\overline{m}_\odot}$ 11 h 44.6 min		Starost 21.7 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 3	.1	120	-3.9	♃	17 5	.0	73	-2.0
♂	12 36	.1	141	1.6	♄	9 16	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 52.5	-11 6.2	30 47.5	149 7.9	-22 7.9	171 4.4	-15 30.5
2	213 52.7	-11 8.0	60 52.4	179 6.5	-22 9.3	201 6.0	-15 31.6
4	243 52.9	-11 9.8	90 57.3	209 5.1	-22 10.6	231 7.5	-15 32.7
6	273 53.1	-11 11.5	121 2.3	239 3.6	-22 12.0	261 9.0	-15 33.8
8	303 53.3	-11 13.3	151 7.2	269 2.2	-22 13.4	291 10.5	-15 34.9
10	333 53.5	-11 15.1	181 12.1	299 .7	-22 14.7	321 12.0	-15 36.0
12	3 53.6	-11 16.8	211 17.0	328 59.3	-22 16.1	351 13.6	-15 37.1
14	33 53.8	-11 18.6	241 22.0	358 57.8	-22 17.4	21 15.1	-15 38.2
16	63 54.0	-11 20.3	271 26.9	28 56.4	-22 18.8	51 16.6	-15 39.3
18	93 54.2	-11 22.1	301 31.8	58 54.9	-22 20.1	81 18.1	-15 40.4
20	123 54.4	-11 23.8	331 36.8	88 53.4	-22 21.5	111 19.6	-15 41.5
22	153 54.5	-11 25.6	1 41.7	118 52.0	-22 22.8	141 21.2	-15 42.6
Δ	1	-9		-7	-7	8	-6

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	262 47.0	90	19 47.4	-114	103 59.3	-22 53.2	221 29.2	6 30.9
2	291 42.9	92	19 24.6	-116	134 3.5	-22 53.1	251 33.6	6 30.7
4	320 39.2	94	19 1.3	-118	164 7.8	-22 53.1	281 38.1	6 30.5
6	349 36.0	96	18 37.7	-120	194 12.0	-22 53.0	311 42.5	6 30.3
8	18 33.2	98	18 13.7	-122	224 16.2	-22 52.9	341 46.9	6 30.1
10	47 30.8	100	17 49.4	-123	254 20.5	-22 52.8	11 51.4	6 29.9
12	76 28.8	102	17 24.7	-125	284 24.7	-22 52.8	41 55.8	6 29.7
14	105 27.2	104	16 59.7	-127	314 28.9	-22 52.7	72 .3	6 29.6
16	134 26.0	106	16 34.4	-128	344 33.2	-22 52.6	102 4.7	6 29.4
18	163 25.2	108	16 8.7	-130	14 37.4	-22 52.6	132 9.1	6 29.2
20	192 24.8	110	15 42.8	-131	44 41.6	-22 52.5	162 13.6	6 29.0
22	221 24.8	112	15 16.6	-132	74 45.9	-22 52.4	192 18.0	6 28.8
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	6 58	16 30	0 43	2 20	23 28	4.0	15 5	.1
55	6 44	16 44	0 37	2 1	23 49	3.6	14 41	.5
50	6 34	16 54	0 33	1 48	. . .	.0	14 23	.8
45	6 25	17 3	0 30	1 38	. . .	.0	14 9	1.0
40	6 18	17 10	0 28	1 30	. . .	.0	13 57	1.2
35	6 12	17 16	0 26	1 25	. . .	.0	13 47	1.3
30	6 7	17 22	0 24	1 20	. . .	.0	13 38	1.5
20	5 57	17 31	0 22	1 14	. . .	.0	13 22	1.7
10	5 49	17 40	0 21	1 11	0 16	2.3	13 8	1.9
0	5 41	17 48	0 21	1 10	0 31	2.1	12 55	2.0
10	5 33	17 56	0 21	1 12	0 46	2.0	12 42	2.2
20	5 24	18 5	0 23	1 16	1 2	1.8	12 28	2.4
30	5 14	18 15	0 25	1 24	1 20	1.6	12 12	2.6
35	5 8	18 21	0 26	1 30	1 30	1.4	12 3	2.8
40	5 2	18 28	0 28	1 39	1 42	1.3	11 52	2.9
45	4 54	18 36	0 31	1 50	1 57	1.1	11 39	3.1
50	4 45	18 45	0 35	2 7	2 14	.9	11 23	3.4
55	4 33	18 57	0 40	2 35	2 36	.6	11 3	3.7
60	4 17	19 13	0 48	3 46	3 6	.2	10 36	4.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 30.4	.4	16.1	$T_{\overline{m}}$ 6 43	2.1	58.5	15.9
12	15 34.7	$T_{\overline{m}_\odot}$ 11 h 44.4 min		Starost 22.7 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 4	.1	118	-3.9	♃	17 2	.0	73	-2.0
♂	12 35	.1	140	1.6	♄	9 13	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 54.7	-11 27.3	31 46.6	148 50.5	-22 24.1	171 22.7	-15 43.7
2	213 54.9	-11 29.1	61 51.5	178 49.0	-22 25.4	201 24.2	-15 44.8
4	243 55.0	-11 30.8	91 56.5	208 47.6	-22 26.8	231 25.7	-15 45.9
6	273 55.2	-11 32.6	122 1.4	238 46.1	-22 28.1	261 27.2	-15 47.0
8	303 55.4	-11 34.3	152 6.3	268 44.6	-22 29.4	291 28.7	-15 48.1
10	333 55.6	-11 36.1	182 11.3	298 43.2	-22 30.7	321 30.2	-15 49.2
12	3 55.7	-11 37.8	212 16.2	328 41.7	-22 32.0	351 31.8	-15 50.3
14	33 55.9	-11 39.6	242 21.1	358 40.2	-22 33.3	21 33.3	-15 51.4
16	63 56.0	-11 41.3	272 26.0	28 38.7	-22 34.6	51 34.8	-15 52.5
18	93 56.2	-11 43.0	302 31.0	58 37.3	-22 35.9	81 36.3	-15 53.6
20	123 56.4	-11 44.8	332 35.9	88 35.8	-22 37.2	111 37.8	-15 54.7
22	153 56.5	-11 46.5	2 40.8	118 34.3	-22 38.5	141 39.3	-15 55.7
Δ	1	-9		-7	-7	8	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	250 25.2	114	14 50.1	-134	104 50.1	-22 52.4	222 22.5	6 28.6
2	279 25.9	115	14 23.4	-135	134 54.3	-22 52.3	252 26.9	6 28.4
4	308 26.9	117	13 56.4	-136	164 58.6	-22 52.2	282 31.3	6 28.2
6	337 28.3	119	13 29.2	-137	195 2.8	-22 52.1	312 35.8	6 28.0
8	6 30.1	120	13 1.8	-138	225 7.0	-22 52.1	342 40.2	6 27.8
10	35 32.2	122	12 34.1	-139	255 11.2	-22 52.0	12 44.7	6 27.7
12	64 34.6	124	12 6.3	-140	285 15.5	-22 51.9	42 49.1	6 27.5
14	93 37.3	125	11 38.2	-141	315 19.7	-22 51.9	72 53.5	6 27.3
16	122 40.3	126	11 10.0	-142	345 23.9	-22 51.8	102 58.0	6 27.1
18	151 43.6	128	10 41.6	-143	15 28.1	-22 51.7	133 2.4	6 26.9
20	180 47.1	129	10 13.1	-143	45 32.3	-22 51.6	163 6.9	6 26.7
22	209 51.0	131	9 44.4	-144	75 36.6	-22 51.6	193 11.3	6 26.5
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 0	16 27	0 43	2 20	. . . .	.0	15 8	.1
55	6 46	16 42	0 37	2 1	. . . .	.0	14 53	.4
50	6 35	16 53	0 33	1 48	0 6	3.3	14 42	.7
45	6 27	17 1	0 30	1 38	0 19	3.1	14 33	.9
40	6 19	17 9	0 28	1 31	0 29	2.9	14 25	1.0
35	6 13	17 15	0 26	1 25	0 38	2.7	14 18	1.2
30	6 7	17 21	0 24	1 20	0 46	2.6	14 12	1.3
20	5 58	17 31	0 22	1 14	0 59	2.4	14 2	1.5
10	5 49	17 39	0 21	1 11	1 11	2.2	13 53	1.7
0	5 41	17 48	0 21	1 10	1 22	2.0	13 44	1.9
10	5 33	17 56	0 22	1 12	1 32	1.8	13 36	2.1
20	5 24	18 5	0 23	1 16	1 44	1.6	13 26	2.3
30	5 13	18 16	0 25	1 24	1 57	1.4	13 16	2.5
35	5 7	18 22	0 26	1 31	2 5	1.2	13 9	2.7
40	5 0	18 29	0 28	1 39	2 13	1.1	13 2	2.8
45	4 52	18 37	0 31	1 51	2 23	.9	12 54	3.0
50	4 43	18 47	0 35	2 8	2 35	.7	12 44	3.2
55	4 30	18 59	0 40	2 37	2 50	.4	12 31	3.5
60	4 14	19 16	0 48	4 1	3 10	.1	12 14	3.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 39.0	.3	16.1	$T_{\overline{m}}$	7 33	2.0	57.9	15.8
12	15 43.0	$T_{\overline{m}_\odot}$	11 h 44.3 min	Starost 23.7 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 5	.1	117	-3.9	♄	16 58	.0	73	-2.0
♂	12 34	.1	140	1.6	♃	9 9	.0	191	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 56.7	-11 48.3	32 45.8	148 32.8	-22 39.8	171 40.8	-15 56.8
2	213 56.8	-11 50.0	62 50.7	178 31.3	-22 41.0	201 42.3	-15 57.9
4	243 57.0	-11 51.7	92 55.6	208 29.8	-22 42.3	231 43.8	-15 59.0
6	273 57.2	-11 53.5	123 .5	238 28.4	-22 43.6	261 45.3	-16 .1
8	303 57.3	-11 55.2	153 5.5	268 26.9	-22 44.8	291 46.8	-16 1.2
10	333 57.5	-11 56.9	183 10.4	298 25.4	-22 46.1	321 48.3	-16 2.3
12	3 57.6	-11 58.7	213 15.3	328 23.9	-22 47.3	351 49.8	-16 3.3
14	33 57.8	-12 .4	243 20.2	358 22.4	-22 48.6	21 51.3	-16 4.4
16	63 57.9	-12 2.1	273 25.2	28 20.9	-22 49.8	51 52.8	-16 5.5
18	93 58.1	-12 3.8	303 30.1	58 19.4	-22 51.1	81 54.3	-16 6.6
20	123 58.2	-12 5.6	333 35.0	88 17.9	-22 52.3	111 55.8	-16 7.7
22	153 58.4	-12 7.3	3 40.0	118 16.4	-22 53.6	141 57.3	-16 8.8
Δ	1	-9		-7	-6	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	238 55.1	132	9 15.5	-145	105 40.8	-22 51.5	223 15.8	6 26.3
2	267 59.5	133	8 46.6	-145	135 45.0	-22 51.4	253 20.2	6 26.1
4	297 4.1	134	8 17.5	-146	165 49.2	-22 51.3	283 24.7	6 26.0
6	326 8.9	135	7 48.3	-146	195 53.4	-22 51.3	313 29.1	6 25.8
8	355 14.0	136	7 19.1	-147	225 57.6	-22 51.2	343 33.5	6 25.6
10	24 19.3	137	6 49.7	-147	256 1.9	-22 51.1	13 38.0	6 25.4
12	53 24.8	138	6 20.2	-148	286 6.1	-22 51.0	43 42.4	6 25.2
14	82 30.5	139	5 50.7	-148	316 10.3	-22 51.0	73 46.9	6 25.0
16	111 36.4	140	5 21.2	-148	346 14.5	-22 50.9	103 51.3	6 24.8
18	140 42.4	141	4 51.5	-148	16 18.7	-22 50.8	133 55.8	6 24.6
20	169 48.7	142	4 21.9	-149	46 22.9	-22 50.8	164 .2	6 24.5
22	198 55.1	143	3 52.1	-149	76 27.1	-22 50.7	194 4.7	6 24.3
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 3	16 25	0 44	2 20	1 4	3.8	15 10	.1
55	6 48	16 39	0 37	2 2	1 16	3.4	15 3	.4
50	6 37	16 51	0 33	1 48	1 25	3.2	14 58	.6
45	6 28	16 60	0 30	1 38	1 32	2.9	14 53	.8
40	6 20	17 7	0 28	1 31	1 38	2.8	14 50	1.0
35	6 14	17 14	0 26	1 25	1 43	2.6	14 47	1.1
30	6 8	17 20	0 24	1 20	1 48	2.5	14 44	1.2
20	5 58	17 30	0 22	1 14	1 56	2.2	14 39	1.4
10	5 49	17 39	0 21	1 11	2 2	2.0	14 35	1.6
0	5 41	17 48	0 21	1 10	2 9	1.9	14 30	1.8
10	5 32	17 56	0 22	1 12	2 15	1.7	14 26	2.0
20	5 23	18 6	0 23	1 16	2 22	1.5	14 22	2.2
30	5 12	18 16	0 25	1 25	2 30	1.3	14 16	2.4
35	5 6	18 23	0 26	1 31	2 34	1.1	14 13	2.6
40	4 59	18 30	0 29	1 39	2 39	1.0	14 10	2.7
45	4 51	18 38	0 31	1 51	2 45	.8	14 6	2.9
50	4 41	18 49	0 35	2 9	2 52	.6	14 1	3.1
55	4 28	19 2	0 41	2 39	3 1	.4	13 55	3.4
60	4 11	19 19	0 49	: : :	3 12	.1	13 47	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 47.0	.3	16.1	$T_{\overline{m}}$	8 20	1.8	57.4	15.6
12	15 50.6	$T_{\overline{m}_\odot}$	11 h 44.2 min	Starost 24.7 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 7	.1	116	-3.9	♄	16 55	.0	73	-2.0
♂	12 33	.1	139	1.5	♃	9 6	.0	190	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 58.5	-12 9.0	33 44.9	148 14.9	-22 54.8	171 58.8	-16 9.8
2	213 58.6	-12 10.7	63 49.8	178 13.4	-22 56.0	202 .3	-16 10.9
4	243 58.8	-12 12.5	93 54.7	208 11.9	-22 57.2	232 1.7	-16 12.0
6	273 58.9	-12 14.2	123 59.7	238 10.3	-22 58.4	262 3.2	-16 13.1
8	303 59.1	-12 15.9	154 4.6	268 8.8	-22 59.6	292 4.7	-16 14.1
10	333 59.2	-12 17.6	184 9.5	298 7.3	-23 .9	322 6.2	-16 15.2
12	3 59.3	-12 19.3	214 14.5	328 5.8	-23 2.1	352 7.7	-16 16.3
14	33 59.5	-12 21.0	244 19.4	358 4.3	-23 3.3	22 9.2	-16 17.4
16	63 59.6	-12 22.7	274 24.3	28 2.8	-23 4.4	52 10.7	-16 18.4
18	93 59.7	-12 24.5	304 29.2	58 1.2	-23 5.6	82 12.1	-16 19.5
20	123 59.9	-12 26.2	334 34.2	87 59.7	-23 6.8	112 13.6	-16 20.6
22	154 .0	-12 27.9	4 39.1	117 58.2	-23 8.0	142 15.1	-16 21.6
Δ	1	-9		-8	-6	7	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	228 1.6	143	3 22.4	-149	106 31.3	-22 50.6	224 9.1	6 24.1
2	257 8.3	144	2 52.7	-149	136 35.5	-22 50.5	254 13.6	6 23.9
4	286 15.1	145	2 22.9	-149	166 39.7	-22 50.5	284 18.0	6 23.7
6	315 22.0	145	1 53.2	-149	196 43.9	-22 50.4	314 22.5	6 23.5
8	344 29.0	146	1 23.4	-149	226 48.1	-22 50.3	344 26.9	6 23.3
10	13 36.2	146	0 53.7	-148	256 52.3	-22 50.2	14 31.4	6 23.2
12	42 43.4	147	0 24.0	-148	286 56.5	-22 50.1	44 35.8	6 23.0
14	71 50.7	147 - 0	5.6	-148	317 .7	-22 50.1	74 40.3	6 22.8
16	100 58.1	147 - 0	35.3	-148	347 4.9	-22 50.0	104 44.7	6 22.6
18	130 5.6	148 - 1	4.8	-148	17 9.1	-22 49.9	134 49.2	6 22.4
20	159 13.1	148 - 1	34.3	-147	47 13.3	-22 49.8	164 53.6	6 22.2
22	188 20.6	148 - 2	3.8	-147	77 17.5	-22 49.8	194 58.1	6 22.0
Δ					21	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 5	16 22	0 44	2 20	2 35	3.7	15 11	.0
55	6 50	16 37	0 38	2 2	2 38	3.3	15 12	.4
50	6 39	16 49	0 33	1 48	2 41	3.1	15 12	.6
45	6 29	16 58	0 30	1 38	2 43	2.9	15 12	.8
40	6 22	17 6	0 28	1 31	2 44	2.7	15 13	.9
35	6 15	17 13	0 26	1 25	2 46	2.5	15 13	1.1
30	6 9	17 19	0 24	1 20	2 47	2.4	15 13	1.2
20	5 59	17 29	0 22	1 14	2 50	2.2	15 14	1.4
10	5 49	17 39	0 21	1 11	2 52	2.0	15 14	1.6
0	5 41	17 47	0 21	1 10	2 54	1.8	15 14	1.8
10	5 32	17 56	0 22	1 12	2 55	1.6	15 15	2.0
20	5 22	18 6	0 23	1 17	2 58	1.4	15 15	2.2
30	5 11	18 17	0 25	1 25	2 60	1.2	15 15	2.4
35	5 5	18 24	0 27	1 31	3 1	1.1	15 15	2.5
40	4 58	18 31	0 29	1 40	3 3	.9	15 16	2.7
45	4 49	18 40	0 31	1 52	3 5	.8	15 16	2.9
50	4 39	18 50	0 35	2 10	3 7	.6	15 16	3.1
55	4 26	19 4	0 41	2 41	3 9	.3	15 16	3.3
60	4 9	19 21	0 49	: ::	3 13	.0	15 17	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	15 54.2	.3	16.1	$T_{\overline{m}}$ 9 4	1.8	56.8	15.5
12	15 57.4	$T_{\overline{m}_\odot}$ 11 h 44.0 min		Starost 25.7 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 8	.1	114	-3.9	♃	16 52	.0	73	-2.0
♂	12 31	.1	138	1.5	♄	9 2	.0	190	1.1

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 .1	-12 29.6	34 44.0	147 56.7	-23 9.2	172 16.6	-16 22.7
2	214 .2	-12 31.3	64 49.0	177 55.1	-23 10.3	202 18.1	-16 23.8
4	244 .4	-12 33.0	94 53.9	207 53.6	-23 11.5	232 19.5	-16 24.8
6	274 .5	-12 34.7	124 58.8	237 52.1	-23 12.7	262 21.0	-16 25.9
8	304 .6	-12 36.4	155 3.7	267 50.6	-23 13.8	292 22.5	-16 27.0
10	334 .7	-12 38.1	185 8.7	297 49.0	-23 15.0	322 24.0	-16 28.0
12	4 .9	-12 39.8	215 13.6	327 47.5	-23 16.1	352 25.4	-16 29.1
14	34 1.0	-12 41.5	245 18.5	357 45.9	-23 17.3	22 26.9	-16 30.2
16	64 1.1	-12 43.2	275 23.5	27 44.4	-23 18.4	52 28.4	-16 31.2
18	94 1.2	-12 44.9	305 28.4	57 42.9	-23 19.6	82 29.9	-16 32.3
20	124 1.3	-12 46.6	335 33.3	87 41.3	-23 20.7	112 31.3	-16 33.3
22	154 1.4	-12 48.3	5 38.2	117 39.8	-23 21.8	142 32.8	-16 34.4
Δ	1	-8		-8	-6	7	-5

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	217 28.2	148 - 2	33.2	-146	107 21.7	-22 49.7	225 2.5	6 21.9
2	246 35.9	148 - 3	2.4	-146	137 25.9	-22 49.6	255 7.0	6 21.7
4	275 43.5	148 - 3	31.6	-145	167 30.1	-22 49.5	285 11.4	6 21.5
6	304 51.2	148 - 4	.7	-145	197 34.3	-22 49.5	315 15.9	6 21.3
8	333 58.9	148 - 4	29.7	-144	227 38.4	-22 49.4	345 20.4	6 21.1
10	3 6.5	148 - 4	58.6	-144	257 42.6	-22 49.3	15 24.8	6 20.9
12	32 14.2	148 - 5	27.4	-143	287 46.8	-22 49.2	45 29.3	6 20.8
14	61 21.9	148 - 5	56.0	-142	317 51.0	-22 49.1	75 33.7	6 20.6
16	90 29.5	148 - 6	24.5	-142	347 55.2	-22 49.1	105 38.2	6 20.4
18	119 37.1	148 - 6	52.8	-141	17 59.4	-22 49.0	135 42.6	6 20.2
20	148 44.6	148 - 7	21.0	-140	48 3.6	-22 48.9	165 47.1	6 20.0
22	177 52.1	147 - 7	49.1	-139	78 7.7	-22 48.8	195 51.5	6 19.8
Δ					21	0	22	-1

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 8	16 19	0 44	2 21	4 3	3.6	15 12	.1
55	6 52	16 35	0 38	2 2	3 58	3.3	15 20	.4
50	6 40	16 47	0 33	1 49	3 55	3.0	15 26	.6
45	6 31	16 57	0 30	1 39	3 52	2.8	15 31	.8
40	6 23	17 5	0 28	1 31	3 49	2.7	15 35	1.0
35	6 16	17 12	0 26	1 25	3 47	2.5	15 39	1.1
30	6 10	17 18	0 24	1 20	3 45	2.4	15 42	1.2
20	5 59	17 29	0 23	1 14	3 42	2.2	15 48	1.5
10	5 50	17 38	0 21	1 11	3 39	2.0	15 53	1.6
0	5 41	17 47	0 21	1 10	3 37	1.8	15 57	1.8
10	5 31	17 57	0 22	1 12	3 34	1.6	16 2	2.0
20	5 22	18 6	0 23	1 17	3 32	1.4	16 7	2.2
30	5 10	18 18	0 25	1 25	3 29	1.2	16 13	2.4
35	5 4	18 25	0 27	1 32	3 27	1.1	16 16	2.5
40	4 56	18 32	0 29	1 40	3 25	1.0	16 20	2.7
45	4 48	18 41	0 32	1 53	3 23	.8	16 24	2.8
50	4 37	18 52	0 35	2 11	3 21	.6	16 29	3.0
55	4 23	19 6	0 41	2 43	3 18	.4	16 36	3.3
60	4 6	19 24	0 50	: ::	3 14	.1	16 44	3.7
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	16 .7	.2	16.1	$T_{\overline{m}}$ 9 47	1.8	56.3	15.3
12	16 3.5	$T_{\overline{m}_\odot}$ 11 h 43.9 min		Starost 26.7 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 9	.1	113	-3.9	♃	16 48	.0	73	-2.0
♂	12 30	.1	138	1.5	♄	8 58	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 1.6	-12 49.9	35 43.2	147 38.2	-23 22.9	172 34.3	-16 35.5
2	214 1.7	-12 51.6	65 48.1	177 36.7	-23 24.1	202 35.7	-16 36.5
4	244 1.8	-12 53.3	95 53.0	207 35.1	-23 25.2	232 37.2	-16 37.6
6	274 1.9	-12 55.0	125 58.0	237 33.6	-23 26.3	262 38.7	-16 38.6
8	304 2.0	-12 56.7	156 2.9	267 32.0	-23 27.4	292 40.1	-16 39.7
10	334 2.1	-12 58.4	186 7.8	297 30.5	-23 28.5	322 41.6	-16 40.7
12	4 2.2	-13 .1	216 12.7	327 28.9	-23 29.6	352 43.1	-16 41.8
14	34 2.3	-13 1.7	246 17.7	357 27.4	-23 30.7	22 44.5	-16 42.9
16	64 2.4	-13 3.4	276 22.6	27 25.8	-23 31.8	52 46.0	-16 43.9
18	94 2.5	-13 5.1	306 27.5	57 24.3	-23 32.8	82 47.4	-16 45.0
20	124 2.6	-13 6.8	336 32.4	87 22.7	-23 33.9	112 48.9	-16 46.0
22	154 2.7	-13 8.4	6 37.4	117 21.1	-23 35.0	142 50.3	-16 47.1
Δ	1	-8		-8	-5	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	206 59.6	147 - 8	16.9	-138	108 11.9	-22 48.7	225 56.0	6 19.7
2	236 6.9	147 - 8	44.6	-138	138 16.1	-22 48.7	256 .5	6 19.5
4	265 14.3	146 - 9	12.1	-137	168 20.3	-22 48.6	286 4.9	6 19.3
6	294 21.5	146 - 9	39.4	-136	198 24.4	-22 48.5	316 9.4	6 19.1
8	323 28.6	145 -10	6.6	-135	228 28.6	-22 48.4	346 13.8	6 18.9
10	352 35.7	145 -10	33.5	-134	258 32.8	-22 48.4	16 18.3	6 18.8
12	21 42.7	144 -11	.2	-132	288 37.0	-22 48.3	46 22.8	6 18.6
14	50 49.5	144 -11	26.7	-131	318 41.1	-22 48.2	76 27.2	6 18.4
16	79 56.3	143 -11	53.0	-130	348 45.3	-22 48.1	106 31.7	6 18.2
18	109 2.9	143 -12	19.0	-129	18 49.5	-22 48.0	136 36.1	6 18.0
20	138 9.5	142 -12	44.8	-128	48 53.7	-22 47.9	166 40.6	6 17.8
22	167 15.9	141 -13	10.3	-126	78 57.8	-22 47.9	196 45.1	6 17.7
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 10	16 17	0 44	2 21	5 31	3.7	15 14	.1
55	6 54	16 33	0 38	2 2	5 18	3.3	15 29	.5
50	6 42	16 45	0 33	1 49	5 8	3.0	15 41	.7
45	6 32	16 55	0 30	1 39	4 60	2.8	15 51	.9
40	6 24	17 3	0 28	1 31	4 53	2.7	15 59	1.1
35	6 17	17 11	0 26	1 25	4 48	2.5	16 6	1.2
30	6 10	17 17	0 24	1 21	4 43	2.4	16 12	1.3
20	5 59	17 28	0 23	1 14	4 34	2.2	16 23	1.5
10	5 50	17 38	0 22	1 11	4 27	2.0	16 32	1.7
0	5 40	17 47	0 21	1 11	4 20	1.8	16 41	1.9
10	5 31	17 57	0 22	1 12	4 13	1.7	16 50	2.0
20	5 21	18 7	0 23	1 17	4 6	1.5	16 59	2.2
30	5 9	18 19	0 25	1 25	3 58	1.3	17 10	2.4
35	5 3	18 26	0 27	1 32	3 53	1.2	17 17	2.5
40	4 55	18 33	0 29	1 41	3 48	1.0	17 24	2.7
45	4 46	18 43	0 32	1 53	3 42	.9	17 32	2.8
50	4 35	18 54	0 36	2 12	3 35	.7	17 42	3.0
55	4 21	19 8	0 41	2 46	3 26	.4	17 55	3.3
60	4 3	19 26	0 50	: ::	3 15	.1	18 12	3.7
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 6.4	.2	16.1	$T_{\overline{m}}$	10 31	1.8	55.8	15.2
12	16 8.9	$T_{\overline{m}_\odot}$	11 h 43.9 min	Starost 27.7 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 10	.1	112	-3.9	♃	16 45	.0	72	-2.0
♂	12 29	.1	137	1.5	♄	8 55	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 2.8	-13 10.1	36 42.3	147 19.6	-23 36.1	172 51.8	-16 48.1
2	214 2.9	-13 11.8	66 47.2	177 18.0	-23 37.1	202 53.3	-16 49.2
4	244 3.0	-13 13.5	96 52.2	207 16.4	-23 38.2	232 54.7	-16 50.2
6	274 3.1	-13 15.1	126 57.1	237 14.9	-23 39.2	262 56.2	-16 51.2
8	304 3.2	-13 16.8	157 2.0	267 13.3	-23 40.3	292 57.6	-16 52.3
10	334 3.3	-13 18.5	187 6.9	297 11.7	-23 41.3	322 59.1	-16 53.3
12	4 3.4	-13 20.1	217 11.9	327 10.2	-23 42.4	353 .5	-16 54.4
14	34 3.4	-13 21.8	247 16.8	357 8.6	-23 43.4	23 2.0	-16 55.4
16	64 3.5	-13 23.4	277 21.7	27 7.0	-23 44.4	53 3.4	-16 56.5
18	94 3.6	-13 25.1	307 26.7	57 5.4	-23 45.5	83 4.8	-16 57.5
20	124 3.7	-13 26.8	337 31.6	87 3.8	-23 46.5	113 6.3	-16 58.5
22	154 3.8	-13 28.4	7 36.5	117 2.3	-23 47.5	143 7.7	-16 59.6
Δ	0	-8		-8	-5	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	196 22.1	141 -13	35.6	-125	109 2.0	-22 47.8	226 49.5	6 17.5
2	225 28.3	140 -14	.7	-124	139 6.2	-22 47.7	256 54.0	6 17.3
4	254 34.3	139 -14	25.4	-122	169 10.3	-22 47.6	286 58.5	6 17.1
6	283 40.1	138 -14	49.9	-121	199 14.5	-22 47.5	317 2.9	6 16.9
8	312 45.8	138 -15	14.1	-120	229 18.7	-22 47.5	347 7.4	6 16.8
10	341 51.3	137 -15	38.0	-118	259 22.8	-22 47.4	17 11.8	6 16.6
12	10 56.7	136 -16	1.6	-117	289 27.0	-22 47.3	47 16.3	6 16.4
14	40 1.9	135 -16	24.9	-115	319 31.1	-22 47.2	77 20.8	6 16.2
16	69 7.0	134 -16	47.9	-113	349 35.3	-22 47.1	107 25.2	6 16.1
18	98 11.9	134 -17	10.6	-112	19 39.5	-22 47.0	137 29.7	6 15.9
20	127 16.6	133 -17	33.0	-110	49 43.6	-22 47.0	167 34.2	6 15.7
22	156 21.1	132 -17	55.0	-108	79 47.8	-22 46.9	197 38.6	6 15.5
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 13	16 14	0 44	2 21	6 59	3.7	15 16	.2
55	6 56	16 31	0 38	2 2	6 37	3.3	15 40	.6
50	6 44	16 43	0 34	1 49	6 21	3.0	15 58	.9
45	6 33	16 54	0 30	1 39	6 8	2.8	16 13	1.1
40	6 25	17 2	0 28	1 31	5 57	2.7	16 25	1.2
35	6 18	17 10	0 26	1 25	5 48	2.5	16 35	1.3
30	6 11	17 16	0 25	1 21	5 40	2.4	16 44	1.5
20	5 60	17 28	0 23	1 14	5 27	2.2	16 59	1.6
10	5 50	17 38	0 22	1 11	5 15	2.1	17 13	1.8
0	5 40	17 47	0 21	1 11	5 4	1.9	17 26	1.9
10	5 31	17 57	0 22	1 12	4 53	1.7	17 39	2.1
20	5 20	18 7	0 23	1 17	4 42	1.6	17 52	2.2
30	5 9	18 19	0 25	1 26	4 29	1.4	18 8	2.4
35	5 2	18 26	0 27	1 32	4 21	1.3	18 17	2.5
40	4 54	18 35	0 29	1 41	4 13	1.1	18 28	2.7
45	4 44	18 44	0 32	1 54	4 3	1.0	18 40	2.8
50	4 33	18 55	0 36	2 13	3 51	.8	18 55	3.0
55	4 19	19 10	0 42	2 48	3 36	.5	19 15	3.3
60	4 0	19 29	0 51	: ::	3 17	.1	19 41	3.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 11.4	.2	16.1	$T_{\overline{m}}$	11 15	1.9	55.4	15.1
12	16 13.5	$T_{\overline{m}_\odot}$	11 h 43.8 min	Starost 28.7 d		Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 11	.1	111	-3.9	♃	16 42	.0	72	-2.0
♂	12 28	.1	136	1.5	♄	8 51	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.9	-13 30.1	37 41.4	147 .7	-23 48.5	173 9.2	-17 .6
2	214 3.9	-13 31.7	67 46.4	176 59.1	-23 49.5	203 10.6	-17 1.7
4	244 4.0	-13 33.4	97 51.3	206 57.5	-23 50.5	233 12.1	-17 2.7
6	274 4.1	-13 35.0	127 56.2	236 55.9	-23 51.5	263 13.5	-17 3.7
8	304 4.2	-13 36.7	158 1.2	266 54.3	-23 52.5	293 14.9	-17 4.8
10	334 4.2	-13 38.3	188 6.1	296 52.8	-23 53.5	323 16.4	-17 5.8
12	4 4.3	-13 40.0	218 11.0	326 51.2	-23 54.5	353 17.8	-17 6.8
14	34 4.4	-13 41.6	248 15.9	356 49.6	-23 55.5	23 19.2	-17 7.9
16	64 4.5	-13 43.3	278 20.9	26 48.0	-23 56.5	53 20.7	-17 8.9
18	94 4.5	-13 44.9	308 25.8	56 46.4	-23 57.4	83 22.1	-17 9.9
20	124 4.6	-13 46.6	338 30.7	86 44.8	-23 58.4	113 23.6	-17 11.0
22	154 4.7	-13 48.2	8 35.7	116 43.2	-23 59.4	143 25.0	-17 12.0
Δ	0	-8		-8	-5	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	185 25.5	131	-18 16.7	-107	109 51.9	-22 46.8	227 43.1	6 15.3
2	214 29.7	130	-18 38.0	-105	139 56.1	-22 46.7	257 47.6	6 15.2
4	243 33.7	129	-18 59.0	-103	170 .2	-22 46.6	287 52.0	6 15.0
6	272 37.5	128	-19 19.6	-101	200 4.4	-22 46.5	317 56.5	6 14.8
8	301 41.1	127	-19 39.9	-99	230 8.5	-22 46.5	348 1.0	6 14.6
10	330 44.6	126	-19 59.7	-98	260 12.7	-22 46.4	18 5.4	6 14.5
12	359 47.8	125	-20 19.3	-96	290 16.8	-22 46.3	48 9.9	6 14.3
14	28 50.9	124	-20 38.4	-94	320 21.0	-22 46.2	78 14.4	6 14.1
16	57 53.8	123	-20 57.1	-92	350 25.1	-22 46.1	108 18.9	6 13.9
18	86 56.5	123	-21 15.4	-90	20 29.3	-22 46.0	138 23.3	6 13.7
20	115 59.0	122	-21 33.4	-88	50 33.4	-22 46.0	168 27.8	6 13.6
22	145 1.3	121	-21 50.9	-86	80 37.6	-22 45.9	198 32.3	6 13.4
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 15	16 11	0 45	2 22	8 29	3.8	15 21	.4
55	6 58	16 28	0 38	2 3	7 57	3.3	15 55	.8
50	6 45	16 42	0 34	1 49	7 34	3.0	16 19	1.1
45	6 35	16 52	0 30	1 39	7 16	2.8	16 38	1.3
40	6 26	17 1	0 28	1 31	7 1	2.6	16 54	1.4
35	6 18	17 9	0 26	1 25	6 49	2.5	17 7	1.5
30	6 12	17 15	0 25	1 21	6 38	2.4	17 19	1.6
20	6 0	17 27	0 23	1 15	6 20	2.2	17 39	1.8
10	5 50	17 37	0 22	1 11	6 4	2.1	17 56	1.9
0	5 40	17 47	0 21	1 11	5 50	2.0	18 12	2.0
10	5 30	17 57	0 22	1 13	5 35	1.8	18 28	2.1
20	5 20	18 8	0 23	1 17	5 20	1.7	18 46	2.3
30	5 8	18 20	0 25	1 26	5 2	1.5	19 6	2.4
35	5 1	18 27	0 27	1 33	4 52	1.4	19 18	2.5
40	4 52	18 36	0 29	1 42	4 40	1.3	19 32	2.6
45	4 43	18 45	0 32	1 54	4 26	1.2	19 48	2.7
50	4 31	18 57	0 36	2 14	4 10	1.0	20 8	2.9
55	4 17	19 12	0 42	2 51	3 49	.7	20 34	3.2
60	3 57	19 32	0 51	: ::	3 21	.3	21 11	3.7
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 15.6	.1	16.1	$T_{\overline{m}}$	12 1	2.0	55.0	15.0
12	16 17.4	$T_{\overline{m}_\odot}$	11 h 43.7 min	Starost	.0 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 13	.1	109	-3.9	♃	16 38	.0	72	-2.0
♂	12 27	.1	135	1.5	♄	8 48	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.7	-13 49.8	38 40.6	146 41.6	-24 .3	173 26.4	-17 13.0
2	214 4.8	-13 51.5	68 45.5	176 40.0	-24 1.3	203 27.8	-17 14.0
4	244 4.8	-13 53.1	98 50.4	206 38.4	-24 2.2	233 29.3	-17 15.1
6	274 4.9	-13 54.7	128 55.4	236 36.8	-24 3.2	263 30.7	-17 16.1
8	304 5.0	-13 56.4	159 .3	266 35.2	-24 4.1	293 32.1	-17 17.1
10	334 5.0	-13 58.0	189 5.2	296 33.6	-24 5.0	323 33.5	-17 18.1
12	4 5.1	-13 59.6	219 10.2	326 32.0	-24 6.0	353 35.0	-17 19.2
14	34 5.1	-14 1.2	249 15.1	356 30.4	-24 6.9	23 36.4	-17 20.2
16	64 5.2	-14 2.9	279 20.0	26 28.8	-24 7.8	53 37.8	-17 21.2
18	94 5.2	-14 4.5	309 24.9	56 27.1	-24 8.7	83 39.2	-17 22.2
20	124 5.3	-14 6.1	339 29.9	86 25.5	-24 9.6	113 40.7	-17 23.2
22	154 5.3	-14 7.7	9 34.8	116 23.9	-24 10.6	143 42.1	-17 24.3
Δ	0	-8		-8	-5	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	174 3.4	120	-22 8.0	-83	110 41.7	-22 45.8	228 36.7	6 13.2
2	203 5.4	119	-22 24.7	-81	140 45.9	-22 45.7	258 41.2	6 13.0
4	232 7.1	118	-22 40.9	-79	170 50.0	-22 45.6	288 45.7	6 12.9
6	261 8.7	117	-22 56.8	-77	200 54.2	-22 45.5	318 50.2	6 12.7
8	290 10.1	116	-23 12.1	-75	230 58.3	-22 45.4	348 54.6	6 12.5
10	319 11.4	115	-23 27.1	-72	261 2.4	-22 45.4	18 59.1	6 12.3
12	348 12.4	114	-23 41.6	-70	291 6.6	-22 45.3	49 3.6	6 12.2
14	17 13.3	114	-23 55.6	-68	321 10.7	-22 45.2	79 8.1	6 12.0
16	46 14.0	113	-24 9.2	-66	351 14.9	-22 45.1	109 12.5	6 11.8
18	75 14.6	112	-24 22.3	-63	21 19.0	-22 45.0	139 17.0	6 11.6
20	104 15.0	111	-24 35.0	-61	51 23.1	-22 44.9	169 21.5	6 11.5
22	133 15.2	110	-24 47.1	-59	81 27.3	-22 44.8	199 26.0	6 11.3
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 18	16 8	0 45	2 22	9 59	3.6	15 29	.7
55	7 0	16 26	0 38	2 3	9 15	3.1	16 15	1.2
50	6 47	16 40	0 34	1 49	8 45	2.8	16 46	1.4
45	6 36	16 51	0 30	1 39	8 23	2.7	17 9	1.6
40	6 27	16 60	0 28	1 31	8 4	2.5	17 28	1.7
35	6 19	17 8	0 26	1 25	7 49	2.5	17 44	1.8
30	6 13	17 14	0 25	1 21	7 36	2.4	17 58	1.8
20	6 1	17 26	0 23	1 15	7 14	2.3	18 21	1.9
10	5 50	17 37	0 22	1 12	6 55	2.1	18 42	2.0
0	5 40	17 47	0 21	1 11	6 37	2.1	19 1	2.1
10	5 30	17 57	0 22	1 13	6 19	2.0	19 20	2.2
20	5 19	18 8	0 23	1 17	6 0	1.9	19 40	2.2
30	5 7	18 21	0 25	1 26	5 39	1.7	20 4	2.3
35	4 59	18 28	0 27	1 33	5 26	1.6	20 18	2.4
40	4 51	18 37	0 29	1 42	5 12	1.5	20 34	2.5
45	4 41	18 47	0 32	1 55	4 55	1.4	20 53	2.6
50	4 29	18 59	0 36	2 16	4 33	1.3	21 18	2.7
55	4 15	19 14	0 42	2 54	4 6	1.0	21 50	2.9
60	3 55	19 34	0 52	: ::	3 27	.5	22 40	3.3
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 19.1	.1	16.1	$T_{\overline{m}}$	12 49	2.0	54.6	14.9
12	16 20.4	$T_{\overline{m}_\odot}$	11 h 43.7 min	Starost	1.0 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 14	.1	108	-3.9	♃	16 35	.0	72	-2.0
♂	12 26	.1	135	1.5	♄	8 44	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.4	−14 9.4	39 39.7	146 22.3	−24 11.5	173 43.5	−17 25.3
2	214 5.4	−14 11.0	69 44.7	176 20.7	−24 12.4	203 44.9	−17 26.3
4	244 5.5	−14 12.6	99 49.6	206 19.1	−24 13.2	233 46.3	−17 27.3
6	274 5.5	−14 14.2	129 54.5	236 17.5	−24 14.1	263 47.7	−17 28.3
8	304 5.6	−14 15.8	159 59.4	266 15.8	−24 15.0	293 49.2	−17 29.3
10	334 5.6	−14 17.4	190 4.4	296 14.2	−24 15.9	323 50.6	−17 30.3
12	4 5.7	−14 19.0	220 9.3	326 12.6	−24 16.8	353 52.0	−17 31.3
14	34 5.7	−14 20.6	250 14.2	356 11.0	−24 17.6	23 53.4	−17 32.4
16	64 5.7	−14 22.3	280 19.1	26 9.3	−24 18.5	53 54.8	−17 33.4
18	94 5.8	−14 23.9	310 24.1	56 7.7	−24 19.4	83 56.2	−17 34.4
20	124 5.8	−14 25.5	340 29.0	86 6.1	−24 20.2	113 57.6	−17 35.4
22	154 5.8	−14 27.1	10 33.9	116 4.5	−24 21.1	143 59.0	−17 36.4
Δ	0	−8		−8	−4	7	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	162 15.3	110	−24 58.8	−56	111 31.4	−22 44.7	229 30.4	6 11.1
2	191 15.3	109	−25 10.1	−54	141 35.5	−22 44.7	259 34.9	6 10.9
4	220 15.1	108	−25 20.8	−51	171 39.7	−22 44.6	289 39.4	6 10.8
6	249 14.8	108	−25 31.0	−49	201 43.8	−22 44.5	319 43.9	6 10.6
8	278 14.3	107	−25 40.8	−46	231 47.9	−22 44.4	349 48.3	6 10.4
10	307 13.8	107	−25 50.0	−44	261 52.0	−22 44.3	19 52.8	6 10.2
12	336 13.1	106	−25 58.8	−41	291 56.2	−22 44.2	49 57.3	6 10.1
14	5 12.3	106	−26 7.1	−39	322 .3	−22 44.1	80 1.8	6 9.9
16	34 11.4	105	−26 14.8	−36	352 4.4	−22 44.0	110 6.3	6 9.7
18	63 10.4	105	−26 22.1	−34	22 8.5	−22 43.9	140 10.7	6 9.6
20	92 9.3	104	−26 28.8	−31	52 12.7	−22 43.9	170 15.2	6 9.4
22	121 8.2	104	−26 35.0	−29	82 16.8	−22 43.8	200 19.7	6 9.2
Δ					21	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 20	16 6	0 45	2 22	11 25	3.0	15 47	1.4
55	7 2	16 24	0 38	2 3	10 28	2.6	16 44	1.7
50	6 49	16 38	0 34	1 49	9 53	2.5	17 21	1.9
45	6 37	16 49	0 31	1 39	9 26	2.4	17 47	1.9
40	6 28	16 59	0 28	1 31	9 5	2.4	18 9	2.0
35	6 20	17 6	0 26	1 26	8 48	2.3	18 26	2.0
30	6 13	17 14	0 25	1 21	8 33	2.3	18 42	2.0
20	6 1	17 26	0 23	1 15	8 8	2.2	19 7	2.1
10	5 50	17 37	0 22	1 12	7 46	2.2	19 30	2.1
0	5 40	17 47	0 21	1 11	7 26	2.1	19 51	2.1
10	5 30	17 57	0 22	1 13	7 6	2.1	20 12	2.1
20	5 19	18 9	0 23	1 18	6 45	2.0	20 34	2.2
30	5 6	18 22	0 25	1 26	6 20	1.9	20 60	2.2
35	4 58	18 29	0 27	1 33	6 6	1.9	21 15	2.2
40	4 50	18 38	0 29	1 43	5 49	1.8	21 33	2.2
45	4 40	18 48	0 32	1 56	5 29	1.7	21 55	2.3
50	4 28	19 1	0 36	2 17	5 4	1.6	22 22	2.3
55	4 12	19 16	0 42	2 58	4 30	1.5	22 59	2.4
60	3 52	19 37	0 52	: ::	3 40	1.0	23 60	2.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 21.8	.1	16.1	$T_{\overline{m}}$	13 38	2.1	54.3	14.8
12	16 22.7	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost	2.0 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 15	.1	107	−3.9	♆	16 32	.0	72	−2.0
♂	12 25	.1	134	1.5	♄	8 41	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.9	−14 28.7	40 38.9	146 2.8	−24 21.9	174 .4	−17 37.4
2	214 5.9	−14 30.3	70 43.8	176 1.2	−24 22.8	204 1.8	−17 38.4
4	244 5.9	−14 31.9	100 48.7	205 59.6	−24 23.6	234 3.2	−17 39.4
6	274 6.0	−14 33.5	130 53.6	235 57.9	−24 24.4	264 4.6	−17 40.4
8	304 6.0	−14 35.0	160 58.6	265 56.3	−24 25.2	294 6.0	−17 41.4
10	334 6.0	−14 36.6	191 3.5	295 54.7	−24 26.1	324 7.4	−17 42.4
12	4 6.0	−14 38.2	221 8.4	325 53.0	−24 26.9	354 8.8	−17 43.4
14	34 6.0	−14 39.8	251 13.4	355 51.4	−24 27.7	24 10.2	−17 44.4
16	64 6.1	−14 41.4	281 18.3	25 49.8	−24 28.5	54 11.6	−17 45.4
18	94 6.1	−14 43.0	311 23.2	55 48.1	−24 29.3	84 13.0	−17 46.4
20	124 6.1	−14 44.6	341 28.1	85 46.5	−24 30.1	114 14.4	−17 47.4
22	154 6.1	−14 46.2	11 33.1	115 44.8	−24 30.9	144 15.8	−17 48.4
Δ	0	−8		−8	−4	7	−5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	150 7.0	104	−26 40.7	−26	112 20.9	−22 43.7	230 24.2	6 9.0
2	179 5.7	103	−26 45.9	−23	142 25.0	−22 43.6	260 28.7	6 8.9
4	208 4.3	103	−26 50.6	−21	172 29.1	−22 43.5	290 33.2	6 8.7
6	237 2.9	103	−26 54.7	−18	202 33.3	−22 43.4	320 37.6	6 8.5
8	266 1.5	103	−26 58.4	−16	232 37.4	−22 43.3	350 42.1	6 8.4
10	295 .0	103	−27 1.5	−13	262 41.5	−22 43.2	20 46.6	6 8.2
12	323 58.5	102	−27 4.1	−10	292 45.6	−22 43.1	50 51.1	6 8.0
14	352 57.0	102	−27 6.1	−8	322 49.7	−22 43.0	80 55.6	6 7.8
16	21 55.5	102	−27 7.7	−5	352 53.8	−22 43.0	111 .1	6 7.7
18	50 54.0	102	−27 8.7	−3	22 58.0	−22 42.9	141 4.5	6 7.5
20	79 52.5	103	−27 9.2	0	53 2.1	−22 42.8	171 9.0	6 7.3
22	108 51.0	103	−27 9.2	3	83 6.2	−22 42.7	201 13.5	6 7.2
Δ					21	0	22	−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 23	16 3	0 45	2 23	12 36	1.9	16 21	2.5
55	7 4	16 22	0 39	2 3	11 32	2.0	17 26	2.3
50	6 50	16 36	0 34	1 50	10 52	2.1	18 5	2.3
45	6 39	16 48	0 31	1 39	10 24	2.1	18 33	2.2
40	6 29	16 57	0 28	1 32	10 2	2.1	18 56	2.2
35	6 21	17 6	0 26	1 26	9 44	2.1	19 14	2.2
30	6 14	17 13	0 25	1 21	9 28	2.1	19 30	2.2
20	6 2	17 25	0 23	1 15	9 1	2.1	19 57	2.2
10	5 51	17 36	0 22	1 12	8 38	2.1	20 20	2.1
0	5 40	17 47	0 21	1 11	8 17	2.1	20 42	2.1
10	5 30	17 58	0 22	1 13	7 56	2.1	21 3	2.1
20	5 18	18 9	0 23	1 18	7 33	2.1	21 26	2.1
30	5 5	18 23	0 25	1 27	7 6	2.1	21 53	2.0
35	4 57	18 30	0 27	1 34	6 51	2.1	22 9	2.0
40	4 49	18 39	0 29	1 43	6 33	2.1	22 27	2.0
45	4 38	18 50	0 32	1 57	6 11	2.1	22 49	1.9
50	4 26	19 2	0 36	2 18	5 43	2.1	23 17	1.9
55	4 10	19 18	0 43	3 1	5 5	2.0	23 56	1.7
60	3 49	19 40	0 53	: ::	4 5	1.9	.. ..	.0
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 23.6	.0	16.1	$T_{\overline{m}}$	14 29	2.1	54.1	14.8
12	16 24.2	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost	3.0 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 17	.1	105	−3.9	♆	16 28	.0	72	−2.0
♂	12 23	.1	133	1.5	♄	8 37	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.1	-14 47.7	41 38.0	145 43.2	-24 31.7	174 17.2	-17 49.4
2	214 6.2	-14 49.3	71 42.9	175 41.6	-24 32.5	204 18.6	-17 50.4
4	244 6.2	-14 50.9	101 47.9	205 39.9	-24 33.2	234 20.0	-17 51.4
6	274 6.2	-14 52.5	131 52.8	235 38.3	-24 34.0	264 21.4	-17 52.4
8	304 6.2	-14 54.0	161 57.7	265 36.6	-24 34.8	294 22.8	-17 53.4
10	334 6.2	-14 55.6	192 2.6	295 35.0	-24 35.5	324 24.2	-17 54.3
12	4 6.2	-14 57.2	222 7.6	325 33.3	-24 36.3	354 25.6	-17 55.3
14	34 6.2	-14 58.7	252 12.5	355 31.7	-24 37.1	24 26.9	-17 56.3
16	64 6.2	-15 .3	282 17.4	25 30.0	-24 37.8	54 28.3	-17 57.3
18	94 6.2	-15 1.9	312 22.4	55 28.4	-24 38.6	84 29.7	-17 58.3
20	124 6.2	-15 3.4	342 27.3	85 26.7	-24 39.3	114 31.1	-17 59.3
22	154 6.2	-15 5.0	12 32.2	115 25.1	-24 40.0	144 32.5	-18 .3
Δ	0	-8		-8	-4	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	137 49.6	103	-27 8.6	5	113 10.3	-22 42.6	231 18.0	6 7.0
2	166 48.1	103	-27 7.6	8	143 14.4	-22 42.5	261 22.5	6 6.8
4	195 46.8	103	-27 6.0	11	173 18.5	-22 42.4	291 27.0	6 6.7
6	224 45.4	104	-27 3.9	13	203 22.6	-22 42.3	321 31.5	6 6.5
8	253 44.2	104	-27 1.2	16	233 26.7	-22 42.2	351 36.0	6 6.3
10	282 42.9	104	-26 58.1	18	263 30.8	-22 42.1	21 40.4	6 6.2
12	311 41.8	105	-26 54.4	21	293 34.9	-22 42.0	51 44.9	6 6.0
14	340 40.7	105	-26 50.3	23	323 39.0	-22 41.9	81 49.4	6 5.8
16	9 39.8	106	-26 45.6	26	353 43.1	-22 41.8	111 53.9	6 5.7
18	38 38.9	106	-26 40.4	28	23 47.2	-22 41.8	141 58.4	6 5.5
20	67 38.1	107	-26 34.7	31	53 51.3	-22 41.7	172 2.9	6 5.3
22	96 37.5	107	-26 28.5	33	83 55.4	-22 41.6	202 7.4	6 5.1
Δ					21	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 26	16 1	0 45	2 23	13 23	1.0	17 20	3.3
55	7 6	16 20	0 39	2 4	12 21	1.5	18 22	2.8
50	6 52	16 35	0 34	1 50	11 42	1.6	18 60	2.6
45	6 40	16 46	0 31	1 40	11 14	1.7	19 27	2.5
40	6 31	16 56	0 28	1 32	10 52	1.8	19 49	2.4
35	6 22	17 5	0 26	1 26	10 34	1.9	20 7	2.4
30	6 15	17 12	0 25	1 21	10 19	1.9	20 23	2.3
20	6 2	17 25	0 23	1 15	9 52	2.0	20 49	2.2
10	5 51	17 36	0 22	1 12	9 29	2.0	21 11	2.1
0	5 40	17 47	0 21	1 11	9 8	2.1	21 32	2.1
10	5 29	17 58	0 22	1 13	8 46	2.1	21 53	2.0
20	5 18	18 10	0 23	1 18	8 24	2.2	22 15	1.9
30	5 4	18 23	0 25	1 27	7 57	2.3	22 41	1.8
35	4 56	18 31	0 27	1 34	7 41	2.3	22 56	1.7
40	4 48	18 40	0 29	1 43	7 23	2.3	23 14	1.7
45	4 37	18 51	0 32	1 57	7 1	2.4	23 35	1.6
50	4 24	19 4	0 37	2 19	6 33	2.5	. . .	.0
55	4 8	19 20	0 43	3 5	5 54	2.6	. . .	.0
60	3 46	19 43	0 53	: : :	4 51	2.9	0 59	1.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 24.7	.0	16.1	$T_{\overline{m}}$ 15 20	2.1	54.0	14.7
12	16 24.9	$T_{\overline{m}_\odot}$ 11 h 43.6 min		Starost 4.0 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 18	.1	104	-3.9	♃	16 25	.0	72	-2.0
♂	12 22	.1	133	1.5	♄	8 34	.0	190	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 6.2	-15 6.6	42 37.1	145 23.4	-24 40.8	174 33.9	-18 1.2
2	214 6.2	-15 8.1	72 42.1	175 21.7	-24 41.5	204 35.2	-18 2.2
4	244 6.2	-15 9.7	102 47.0	205 20.1	-24 42.2	234 36.6	-18 3.2
6	274 6.2	-15 11.2	132 51.9	235 18.4	-24 42.9	264 38.0	-18 4.2
8	304 6.2	-15 12.8	162 56.9	265 16.8	-24 43.6	294 39.4	-18 5.2
10	334 6.2	-15 14.3	193 1.8	295 15.1	-24 44.3	324 40.8	-18 6.1
12	4 6.2	-15 15.9	223 6.7	325 13.4	-24 45.0	354 42.1	-18 7.1
14	34 6.2	-15 17.4	253 11.6	355 11.8	-24 45.7	24 43.5	-18 8.1
16	64 6.1	-15 19.0	283 16.6	25 10.1	-24 46.4	54 44.9	-18 9.1
18	94 6.1	-15 20.5	313 21.5	55 8.5	-24 47.1	84 46.2	-18 10.0
20	124 6.1	-15 22.1	343 26.4	85 6.8	-24 47.8	114 47.6	-18 11.0
22	154 6.1	-15 23.6	13 31.3	115 5.1	-24 48.5	144 49.0	-18 12.0
Δ	0	-8		-8	-3	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	125 36.9	108	-26 21.8	36	113 59.5	-22 41.5	232 11.9	6 5.0
2	154 36.5	108	-26 14.6	38	144 3.6	-22 41.4	262 16.4	6 4.8
4	183 36.1	109	-26 6.9	41	174 7.7	-22 41.3	292 20.9	6 4.6
6	212 36.0	110	-25 58.7	43	204 11.8	-22 41.2	322 25.4	6 4.5
8	241 35.9	110	-25 50.1	46	234 15.9	-22 41.1	352 29.9	6 4.3
10	270 36.0	111	-25 40.9	48	264 20.0	-22 41.0	22 34.3	6 4.2
12	299 36.3	112	-25 31.3	51	294 24.1	-22 40.9	52 38.8	6 4.0
14	328 36.7	113	-25 21.2	53	324 28.2	-22 40.8	82 43.3	6 3.8
16	357 37.2	114	-25 10.6	55	354 32.3	-22 40.7	112 47.8	6 3.7
18	26 37.9	114	-24 59.5	58	24 36.4	-22 40.6	142 52.3	6 3.5
20	55 38.8	115	-24 48.0	60	54 40.5	-22 40.5	172 56.8	6 3.3
22	84 39.8	116	-24 36.0	62	84 44.6	-22 40.4	203 1.3	6 3.2
Δ					20	0	22	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 28	15 58	0 46	2 24	13 47	.5	18 39	3.6
55	7 8	16 18	0 39	2 4	12 56	1.0	19 30	3.1
50	6 53	16 33	0 34	1 50	12 22	1.3	20 3	2.9
45	6 42	16 45	0 31	1 40	11 56	1.4	20 28	2.7
40	6 32	16 55	0 28	1 32	11 36	1.5	20 47	2.6
35	6 23	17 4	0 26	1 26	11 19	1.6	21 4	2.5
30	6 16	17 11	0 25	1 21	11 4	1.7	21 18	2.4
20	6 3	17 24	0 23	1 15	10 40	1.8	21 42	2.2
10	5 51	17 36	0 22	1 12	10 18	1.9	22 3	2.1
0	5 40	17 47	0 21	1 11	9 58	2.0	22 22	2.0
10	5 29	17 58	0 22	1 13	9 38	2.1	22 41	1.9
20	5 17	18 10	0 23	1 18	9 16	2.2	23 1	1.8
30	5 4	18 24	0 25	1 27	8 51	2.3	23 25	1.6
35	4 55	18 32	0 27	1 34	8 36	2.4	23 38	1.5
40	4 46	18 42	0 29	1 44	8 19	2.5	23 54	1.4
45	4 36	18 52	0 33	1 58	7 58	2.6	. . .	.0
50	4 22	19 6	0 37	2 21	7 32	2.8	0 2	1.4
55	4 6	19 23	0 43	3 10	6 57	3.0	0 38	1.2
60	3 44	19 45	0 54	: : :	6 1	3.5	1 34	.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	16 25.0	.0	16.1	$T_{\overline{m}}$ 16 10	2.0	54.1	14.7
12	16 24.8	$T_{\overline{m}_\odot}$ 11 h 43.6 min		Starost 5.0 d		Faza ◐	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 19	.1	103	-3.9	♃	16 22	.0	71	-2.0
♂	12 21	.1	132	1.5	♄	8 30	.0	190	1.1

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	184	6.1	−15	25.1	43	36.3	145	3.5	−24	49.1	174	50.4	−18	13.0
2	214	6.1	−15	26.7	73	41.2	175	1.8	−24	49.8	204	51.7	−18	13.9
4	244	6.0	−15	28.2	103	46.1	205	.1	−24	50.5	234	53.1	−18	14.9
6	274	6.0	−15	29.7	133	51.1	234	58.5	−24	51.1	264	54.5	−18	15.9
8	304	6.0	−15	31.3	163	56.0	264	56.8	−24	51.8	294	55.8	−18	16.8
10	334	6.0	−15	32.8	194	.9	294	55.1	−24	52.4	324	57.2	−18	17.8
12	4	5.9	−15	34.3	224	5.8	324	53.5	−24	53.1	354	58.5	−18	18.8
14	34	5.9	−15	35.9	254	10.8	354	51.8	−24	53.7	24	59.9	−18	19.7
16	64	5.9	−15	37.4	284	15.7	24	50.1	−24	54.3	55	1.3	−18	20.7
18	94	5.9	−15	38.9	314	20.6	54	48.4	−24	55.0	85	2.6	−18	21.7
20	124	5.8	−15	40.4	344	25.6	84	46.8	−24	55.6	115	4.0	−18	22.6
22	154	5.8	−15	41.9	14	30.5	114	45.1	−24	56.2	145	5.3	−18	23.6
Δ		0		−8				−8		−3		7		−5

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	113	41.0	117	−24	23.6	64	114	48.7	−22	40.3	233	5.8	6	3.0
2	142	42.3	118	−24	10.7	67	144	52.7	−22	40.2	263	10.3	6	2.8
4	171	43.9	119	−23	57.3	69	174	56.8	−22	40.1	293	14.8	6	2.7
6	200	45.6	119	−23	43.5	71	205	.9	−22	40.0	323	19.3	6	2.5
8	229	47.4	120	−23	29.3	73	235	5.0	−22	39.9	353	23.8	6	2.3
10	258	49.5	121	−23	14.7	75	265	9.1	−22	39.9	23	28.3	6	2.2
12	287	51.7	122	−22	59.6	78	295	13.2	−22	39.8	53	32.8	6	2.0
14	316	54.1	123	−22	44.1	80	325	17.3	−22	39.7	83	37.3	6	1.8
16	345	56.7	124	−22	28.1	82	355	21.3	−22	39.6	113	41.8	6	1.7
18	14	59.5	125	−22	11.8	84	25	25.4	−22	39.5	143	46.3	6	1.5
20	44	2.4	126	−21	55.0	86	55	29.5	−22	39.4	173	50.8	6	1.4
22	73	5.5	126	−21	37.8	88	85	33.6	−22	39.3	203	55.3	6	1.2
Δ								20		0		23		−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 31	15 56	0 46	2 24	13 60	.3	20 6	3.7
55	7 10	16 16	0 39	2 4	13 20	.7	20 45	3.3
50	6 55	16 31	0 34	1 50	12 52	1.0	21 12	3.0
45	6 43	16 44	0 31	1 40	12 30	1.2	21 32	2.8
40	6 33	16 54	0 28	1 32	12 13	1.3	21 49	2.6
35	6 24	17 3	0 26	1 26	11 58	1.4	22 3	2.5
30	6 16	17 10	0 25	1 21	11 45	1.5	22 15	2.4
20	6 3	17 24	0 23	1 15	11 23	1.7	22 35	2.2
10	5 51	17 36	0 22	1 12	11 4	1.8	22 53	2.1
0	5 40	17 47	0 21	1 11	10 47	2.0	23 9	1.9
10	5 29	17 58	0 22	1 13	10 29	2.1	23 26	1.8
20	5 17	18 11	0 23	1 18	10 9	2.2	23 43	1.6
30	5 3	18 25	0 25	1 27	9 47	2.4	.. ..	.0
35	4 55	18 33	0 27	1 35	9 34	2.5	.. ..	.0
40	4 45	18 43	0 30	1 44	9 19	2.6	.. ..	.0
45	4 34	18 54	0 33	1 59	9 1	2.7	0 13	1.3
50	4 21	19 7	0 37	2 22	8 39	2.9	0 36	1.1
55	4 4	19 25	0 44	3 15	8 9	3.2	1 7	.8
60	3 41	19 48	0 55	: ::	7 25	3.7	1 52	.4
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 24.5	−.1	16.2	$T_{\overline{m}}$	16 58	1.9	54.3	14.8
12	16 23.9	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost	6.0 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 21	.1	101	−3.9	♃	16 19	.0	71	−2.0
♂	12 20	.1	131	1.5	♄	8 26	.0	189	1.1

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	184	5.8	−15	43.5	44	35.4	144	43.4	−24	56.8	175	6.7	−18	24.5
2	214	5.7	−15	45.0	74	40.3	174	41.7	−24	57.4	205	8.1	−18	25.5
4	244	5.7	−15	46.5	104	45.3	204	40.1	−24	58.0	235	9.4	−18	26.4
6	274	5.6	−15	48.0	134	50.2	234	38.4	−24	58.6	265	10.8	−18	27.4
8	304	5.6	−15	49.5	164	55.1	264	36.7	−24	59.2	295	12.1	−18	28.4
10	334	5.6	−15	51.0	195	.1	294	35.0	−24	59.8	325	13.5	−18	29.3
12	4	5.5	−15	52.5	225	5.0	324	33.3	−25	.4	355	14.8	−18	30.3
14	34	5.5	−15	54.0	255	9.9	354	31.7	−25	1.0	25	16.2	−18	31.2
16	64	5.4	−15	55.5	285	14.8	24	30.0	−25	1.5	55	17.5	−18	32.2
18	94	5.4	−15	57.0	315	19.8	54	28.3	−25	2.1	85	18.9	−18	33.1
20	124	5.3	−15	58.5	345	24.7	84	26.6	−25	2.7	115	20.2	−18	34.1
22	154	5.3	−16	.0	15	29.6	114	24.9	−25	3.2	145	21.5	−18	35.0
Δ		0		−8				−8		−3		7		−5

UT	MESEC					JUPITER				SATURN			
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	102	8.8	127	−21	20.3	90	115	37.7	−22	39.2	233	59.8	6	1.0
2	131	12.2	128	−21	2.3	92	145	41.7	−22	39.1	264	4.3	6	.9
4	160	15.8	129	−20	43.9	94	175	45.8	−22	39.0	294	8.8	6	.7
6	189	19.6	130	−20	25.2	96	205	49.9	−22	38.9	324	13.3	6	.5
8	218	23.6	131	−20	6.1	97	235	54.0	−22	38.8	354	17.8	6	.4
10	247	27.7	131	−19	46.6	99	265	58.0	−22	38.7	24	22.3	6	.2
12	276	32.0	132	−19	26.7	101	296	2.1	−22	38.6	54	26.8	6	.1
14	305	36.4	133	−19	6.4	103	326	6.2	−22	38.5	84	31.3	5	59.9
16	334	41.0	134	−18	45.8	105	356	10.2	−22	38.4	114	35.9	5	59.7
18	3	45.7	134	−18	24.9	107	26	14.3	−22	38.3	144	40.4	5	59.6
20	32	50.6	135	−18	3.6	108	56	18.4	−22	38.2	174	44.9	5	59.4
22	61	55.6	136	−17	41.9	110	86	22.4	−22	38.1	204	49.4	5	59.3
Δ								20		0		23		−1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 33	15 53	0 46	2 25	14 6	.1	21 35	3.7
55	7 13	16 14	0 39	2 5	13 37	.5	22 3	3.3
50	6 57	16 30	0 34	1 51	13 15	.8	22 23	3.0
45	6 44	16 42	0 31	1 40	12 58	1.0	22 39	2.8
40	6 34	16 53	0 28	1 32	12 44	1.1	22 52	2.7
35	6 25	17 2	0 26	1 26	12 32	1.3	23 3	2.5
30	6 17	17 10	0 25	1 21	12 22	1.4	23 12	2.4
20	6 4	17 23	0 23	1 15	12 4	1.6	23 28	2.2
10	5 52	17 36	0 22	1 12	11 48	1.7	23 42	2.0
0	5 40	17 47	0 21	1 12	11 33	1.9	23 55	1.9
10	5 29	17 59	0 22	1 13	11 19	2.0	.. ..	.0
20	5 16	18 11	0 23	1 18	11 3	2.2	.. ..	.0
30	5 2	18 26	0 26	1 28	10 44	2.4	0 3	1.4
35	4 54	18 34	0 27	1 35	10 34	2.5	0 15	1.3
40	4 44	18 44	0 30	1 45	10 21	2.6	0 28	1.2
45	4 33	18 55	0 33	1 60	10 7	2.8	0 44	1.1
50	4 19	19 9	0 37	2 24	9 49	3.0	1 3	.9
55	4 2	19 27	0 44	3 21	9 26	3.3	1 27	.6
60	3 38	19 51	0 55	: ::	8 53	3.7	2 2	.2
S								

SUNCE				MESEC				
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 23.2	−.1	16.2	$T_{\overline{m}}$	17 44	1.9	54.6	14.9
12	16 22.1	$T_{\overline{m}_\odot}$	11 h 43.6 min	Starost	7.0 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 22	.1	100	−3.9	♃	16 15	.0	71	−2.0
♂	12 19	.1	131	1.5	♄	8 23	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 5.2	-16 1.5	45 34.6	144 23.2	-25 3.8	175 22.9	-18 36.0
2	214 5.2	-16 3.0	75 39.5	174 21.6	-25 4.3	205 24.2	-18 36.9
4	244 5.1	-16 4.5	105 44.4	204 19.9	-25 4.9	235 25.6	-18 37.9
6	274 5.1	-16 6.0	135 49.3	234 18.2	-25 5.4	265 26.9	-18 38.8
8	304 5.0	-16 7.5	165 54.3	264 16.5	-25 5.9	295 28.3	-18 39.7
10	334 4.9	-16 9.0	195 59.2	294 14.8	-25 6.5	325 29.6	-18 40.7
12	4 4.9	-16 10.5	226 4.1	324 13.1	-25 7.0	355 30.9	-18 41.6
14	34 4.8	-16 11.9	256 9.1	354 11.4	-25 7.5	25 32.3	-18 42.6
16	64 4.8	-16 13.4	286 14.0	24 9.7	-25 8.0	55 33.6	-18 43.5
18	94 4.7	-16 14.9	316 18.9	54 8.1	-25 8.5	85 34.9	-18 44.4
20	124 4.6	-16 16.4	346 23.8	84 6.4	-25 9.0	115 36.3	-18 45.4
22	154 4.6	-16 17.9	16 28.8	114 4.7	-25 9.5	145 37.6	-18 46.3
Δ	0	-7		-8	-3	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	91 .8	136	-17 19.9	112	116 26.5	-22 38.0	234 53.9	5 59.1
2	120 6.1	137	-16 57.6	113	146 30.6	-22 37.9	264 58.4	5 58.9
4	149 11.5	138	-16 34.9	115	176 34.6	-22 37.8	295 2.9	5 58.8
6	178 17.0	138	-16 12.0	116	206 38.7	-22 37.7	325 7.4	5 58.6
8	207 22.7	139	-15 48.7	118	236 42.8	-22 37.6	355 11.9	5 58.5
10	236 28.4	139	-15 25.0	120	266 46.8	-22 37.5	25 16.4	5 58.3
12	265 34.3	140	-15 1.1	121	296 50.9	-22 37.4	55 20.9	5 58.1
14	294 40.3	140	-14 36.9	123	326 55.0	-22 37.3	85 25.5	5 58.0
16	323 46.4	141	-14 12.4	124	356 59.0	-22 37.2	115 30.0	5 57.8
18	352 52.5	141	-13 47.6	126	27 3.1	-22 37.1	145 34.5	5 57.7
20	21 58.8	142	-13 22.5	127	57 7.1	-22 37.0	175 39.0	5 57.5
22	51 5.1	142	-12 57.1	128	87 11.2	-22 36.9	205 43.5	5 57.4
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 36	15 51	0 46	2 25	14 10	.1	23 4	3.7
55	7 15	16 12	0 39	2 5	13 49	.4	23 22	3.3
50	6 58	16 28	0 35	1 51	13 34	.7	23 36	3.1
45	6 46	16 41	0 31	1 40	13 22	.9	23 47	2.9
40	6 35	16 52	0 28	1 32	13 12	1.0	23 55	2.7
35	6 26	17 1	0 26	1 26	13 3	1.2	. . ..	.0
30	6 18	17 9	0 25	1 22	12 55	1.3	. . ..	.0
20	6 4	17 23	0 23	1 15	12 42	1.5	. . ..	.0
10	5 52	17 35	0 22	1 12	12 30	1.7	. . ..	.0
0	5 40	17 47	0 22	1 12	12 19	1.8	. . ..	.0
10	5 28	17 59	0 22	1 14	12 8	2.0	0 8	1.7
20	5 16	18 12	0 23	1 19	11 56	2.2	0 22	1.5
30	5 1	18 27	0 26	1 28	11 42	2.4	0 38	1.3
35	4 53	18 35	0 27	1 35	11 34	2.5	0 47	1.2
40	4 43	18 45	0 30	1 45	11 25	2.7	0 57	1.1
45	4 31	18 57	0 33	2 0	11 14	2.8	1 9	.9
50	4 18	19 11	0 37	2 25	11 1	3.0	1 24	.7
55	3 60	19 29	0 44	3 28	10 44	3.3	1 42	.5
60	3 36	19 53	0 56	: ::	10 22	3.7	2 7	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 21.1	-.1	16.2	$T_{\overline{m}}$	18 29	1.8	55.1	15.0
12	16 19.6	$T_{\overline{m}_\odot}$	11 h 43.7 min	Starost	8.0 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 23	.1	99	-3.9	♃	16 12	.0	71	-1.9
♂	12 18	.1	130	1.5	♄	8 19	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 4.5	-16 19.3	46 33.7	144 3.0	-25 10.0	175 38.9	-18 47.2
2	214 4.4	-16 20.8	76 38.6	174 1.3	-25 10.5	205 40.3	-18 48.2
4	244 4.3	-16 22.3	106 43.6	203 59.6	-25 11.0	235 41.6	-18 49.1
6	274 4.3	-16 23.7	136 48.5	233 57.9	-25 11.5	265 42.9	-18 50.0
8	304 4.2	-16 25.2	166 53.4	263 56.2	-25 11.9	295 44.3	-18 51.0
10	334 4.1	-16 26.7	196 58.3	293 54.5	-25 12.4	325 45.6	-18 51.9
12	4 4.0	-16 28.1	227 3.3	323 52.8	-25 12.9	355 46.9	-18 52.8
14	34 4.0	-16 29.6	257 8.2	353 51.1	-25 13.3	25 48.2	-18 53.7
16	64 3.9	-16 31.0	287 13.1	23 49.4	-25 13.8	55 49.6	-18 54.7
18	94 3.8	-16 32.5	317 18.0	53 47.7	-25 14.2	85 50.9	-18 55.6
20	124 3.7	-16 33.9	347 23.0	83 46.0	-25 14.7	115 52.2	-18 56.5
22	154 3.6	-16 35.4	17 27.9	113 44.4	-25 15.1	145 53.5	-18 57.4
Δ	0	-7		-8	-2	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_4	δ_4	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	80 11.4	142	-12 31.4	130	117 15.3	-22 36.8	235 48.0	5 57.2
2	109 17.9	142	-12 5.5	131	147 19.3	-22 36.7	265 52.5	5 57.0
4	138 24.4	143	-11 39.3	132	177 23.4	-22 36.5	295 57.0	5 56.9
6	167 30.9	143	-11 12.8	134	207 27.4	-22 36.4	326 1.6	5 56.7
8	196 37.5	143	-10 46.1	135	237 31.5	-22 36.3	356 6.1	5 56.6
10	225 44.1	143	-10 19.2	136	267 35.5	-22 36.2	26 10.6	5 56.4
12	254 50.7	143	- 9 52.0	137	297 39.6	-22 36.1	56 15.1	5 56.3
14	283 57.4	143	- 9 24.5	138	327 43.6	-22 36.0	86 19.6	5 56.1
16	313 4.0	143	- 8 56.9	139	357 47.7	-22 35.9	116 24.1	5 56.0
18	342 10.6	143	- 8 29.0	140	27 51.7	-22 35.8	146 28.7	5 55.8
20	11 17.3	143	- 8 .9	142	57 55.8	-22 35.7	176 33.2	5 55.6
22	40 23.9	143	- 7 32.6	143	87 59.8	-22 35.6	206 37.7	5 55.5
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 38	15 48	0 47	2 26	14 12	.1	. . ..	.0
55	7 17	16 10	0 40	2 5	13 60	.4	. . ..	.0
50	7 0	16 27	0 35	1 51	13 50	.6	. . ..	.0
45	6 47	16 40	0 31	1 40	13 43	.8	. . ..	.0
40	6 36	16 51	0 28	1 33	13 36	1.0	. . ..	.0
35	6 27	17 0	0 26	1 26	13 31	1.1	0 3	2.5
30	6 19	17 8	0 25	1 22	13 26	1.2	0 10	2.4
20	6 5	17 23	0 23	1 15	13 17	1.5	0 21	2.2
10	5 52	17 35	0 22	1 12	13 10	1.7	0 31	2.0
0	5 40	17 47	0 22	1 12	13 3	1.8	0 40	1.8
10	5 28	17 59	0 22	1 14	12 56	2.0	0 49	1.7
20	5 15	18 12	0 23	1 19	12 48	2.2	0 59	1.5
30	5 1	18 27	0 26	1 28	12 40	2.4	1 10	1.3
35	4 52	18 36	0 27	1 36	12 35	2.6	1 16	1.1
40	4 42	18 46	0 30	1 46	12 29	2.7	1 23	1.0
45	4 30	18 58	0 33	2 1	12 22	2.9	1 31	.8
50	4 16	19 13	0 38	2 27	12 14	3.1	1 41	.6
55	3 58	19 31	0 45	3 37	12 4	3.4	1 54	.4
60	3 33	19 56	0 57	: ::	11 51	3.7	2 9	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 18.1	-.2	16.2	$T_{\overline{m}}$	19 13	1.9	55.8	15.2
12	16 16.3	$T_{\overline{m}_\odot}$	11 h 43.7 min	Starost	9.0 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 25	.1	97	-3.9	♃	16 9	.0	71	-1.9
♂	12 17	.1	129	1.5	♄	8 16	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 3.6	-16 36.8	47 32.8	143 42.7	-25 15.5	175 54.8	-18 58.4
2	214 3.5	-16 38.3	77 37.8	173 41.0	-25 16.0	205 56.2	-18 59.3
4	244 3.4	-16 39.7	107 42.7	203 39.3	-25 16.4	235 57.5	-19 .2
6	274 3.3	-16 41.2	137 47.6	233 37.6	-25 16.8	265 58.8	-19 1.1
8	304 3.2	-16 42.6	167 52.5	263 35.9	-25 17.2	296 .1	-19 2.0
10	334 3.1	-16 44.1	197 57.5	293 34.2	-25 17.6	326 1.4	-19 3.0
12	4 3.0	-16 45.5	228 2.4	323 32.5	-25 18.0	356 2.7	-19 3.9
14	34 2.9	-16 46.9	258 7.3	353 30.8	-25 18.4	26 4.0	-19 4.8
16	64 2.8	-16 48.4	288 12.3	23 29.1	-25 18.8	56 5.3	-19 5.7
18	94 2.7	-16 49.8	318 17.2	53 27.4	-25 19.2	86 6.7	-19 6.6
20	124 2.6	-16 51.2	348 22.1	83 25.7	-25 19.6	116 8.0	-19 7.5
22	154 2.5	-16 52.7	18 27.0	113 24.0	-25 20.0	146 9.3	-19 8.4
Δ	0	-7		-8	-2	7	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	69 30.5	143	-7 4.1	144	118 3.9	-22 35.5	236 42.2	5 55.3
2	98 37.0	143	-6 35.4	144	148 7.9	-22 35.4	266 46.7	5 55.2
4	127 43.5	142	-6 6.5	145	178 12.0	-22 35.3	296 51.2	5 55.0
6	156 50.0	142	-5 37.4	146	208 16.0	-22 35.2	326 55.8	5 54.9
8	185 56.4	142	-5 8.2	147	238 20.0	-22 35.1	357 .3	5 54.7
10	215 2.7	141	-4 38.7	148	268 24.1	-22 35.0	27 4.8	5 54.6
12	244 8.9	141	-4 9.1	149	298 28.1	-22 34.9	57 9.3	5 54.4
14	273 15.1	140	-3 39.4	149	328 32.2	-22 34.8	87 13.9	5 54.3
16	302 21.1	140	-3 9.5	150	358 36.2	-22 34.7	117 18.4	5 54.1
18	331 27.0	139	-2 39.5	151	28 40.3	-22 34.6	147 22.9	5 53.9
20	0 32.8	138	-2 9.3	151	58 44.3	-22 34.5	177 27.4	5 53.8
22	29 38.5	138	-1 39.0	152	88 48.3	-22 34.3	207 32.0	5 53.6
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 41	15 46	0 47	2 26	14 13	.1	0 34	3.8
55	7 19	16 8	0 40	2 6	14 9	.4	0 43	3.4
50	7 2	16 25	0 35	1 51	14 5	.6	0 50	3.1
45	6 48	16 39	0 31	1 41	14 2	.8	0 56	2.9
40	6 37	16 50	0 29	1 33	13 60	1.0	1 0	2.8
35	6 28	16 59	0 27	1 27	13 58	1.1	1 4	2.6
30	6 20	17 8	0 25	1 22	13 56	1.3	1 8	2.5
20	6 5	17 22	0 23	1 16	13 53	1.5	1 14	2.2
10	5 52	17 35	0 22	1 12	13 50	1.7	1 19	2.0
0	5 40	17 47	0 22	1 12	13 47	1.9	1 24	1.9
10	5 28	17 60	0 22	1 14	13 44	2.1	1 29	1.7
20	5 15	18 13	0 23	1 19	13 42	2.3	1 34	1.5
30	4 60	18 28	0 26	1 29	13 38	2.5	1 40	1.2
35	4 51	18 37	0 28	1 36	13 36	2.7	1 43	1.1
40	4 41	18 47	0 30	1 47	13 34	2.8	1 47	1.0
45	4 29	18 59	0 33	2 2	13 32	3.0	1 51	.8
50	4 14	19 14	0 38	2 29	13 29	3.2	1 57	.6
55	3 56	19 33	0 45	3 52	13 25	3.5	2 3	.4
60	3 31	19 59	0 57	: ::	13 20	3.8	2 11	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 14.4	-.2	16.2	$T_{\overline{m}}$	19 58	1.9	56.6	15.4
12	16 12.1	$T_{\overline{m}_\odot}$	11 h 43.8 min	Starost 10.0 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 26	.1	96	-3.9	♃	16 6	.0	71	-1.9
♂	12 16	.1	128	1.5	♄	8 12	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 2.4	-16 54.1	48 32.0	143 22.3	-25 20.3	176 10.6	-19 9.3
2	214 2.3	-16 55.5	78 36.9	173 20.6	-25 20.7	206 11.9	-19 10.2
4	244 2.2	-16 56.9	108 41.8	203 18.9	-25 21.1	236 13.2	-19 11.2
6	274 2.1	-16 58.4	138 46.8	233 17.2	-25 21.4	266 14.5	-19 12.1
8	304 2.0	-16 59.8	168 51.7	263 15.5	-25 21.8	296 15.8	-19 13.0
10	334 1.9	-17 1.2	198 56.6	293 13.8	-25 22.1	326 17.1	-19 13.9
12	4 1.8	-17 2.6	229 1.5	323 12.1	-25 22.5	356 18.4	-19 14.8
14	34 1.6	-17 4.0	259 6.5	353 10.4	-25 22.8	26 19.7	-19 15.7
16	64 1.5	-17 5.4	289 11.4	23 8.6	-25 23.1	56 21.0	-19 16.6
18	94 1.4	-17 6.8	319 16.3	53 6.9	-25 23.5	86 22.3	-19 17.5
20	124 1.3	-17 8.2	349 21.3	83 5.2	-25 23.8	116 23.6	-19 18.4
22	154 1.2	-17 9.6	19 26.2	113 3.5	-25 24.1	146 24.9	-19 19.3
Δ	-1	-7		-9	-2	6	-5

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	58 44.1	137	-1 8.6	153	118 52.4	-22 34.2	237 36.5	5 53.5
2	87 49.4	136	-0 38.1	153	148 56.4	-22 34.1	267 41.0	5 53.3
4	116 54.7	135	-0 7.5	154	179 .4	-22 34.0	297 45.5	5 53.2
6	145 59.7	134	0 23.2	154	209 4.5	-22 33.9	327 50.1	5 53.0
8	175 4.6	133	0 54.0	154	239 8.5	-22 33.8	357 54.6	5 52.9
10	204 9.3	132	1 24.9	155	269 12.5	-22 33.7	27 59.1	5 52.7
12	233 13.7	131	1 55.8	155	299 16.6	-22 33.6	58 3.6	5 52.6
14	262 18.0	130	2 26.7	155	329 20.6	-22 33.5	88 8.2	5 52.4
16	291 22.0	129	2 57.8	155	359 24.6	-22 33.4	118 12.7	5 52.3
18	320 25.9	128	3 28.8	155	29 28.7	-22 33.3	148 17.2	5 52.1
20	349 29.4	127	3 59.9	155	59 32.7	-22 33.2	178 21.7	5 52.0
22	18 32.7	125	4 31.0	155	89 36.7	-22 33.0	208 26.3	5 51.8
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 44	15 43	0 47	2 27	14 15	.1	2 4	3.9
55	7 21	16 6	0 40	2 6	14 18	.4	2 5	3.5
50	7 3	16 24	0 35	1 51	14 20	.7	2 5	3.3
45	6 50	16 37	0 31	1 41	14 22	.9	2 6	3.0
40	6 39	16 49	0 29	1 33	14 24	1.1	2 6	2.9
35	6 29	16 58	0 27	1 27	14 25	1.2	2 7	2.7
30	6 20	17 7	0 25	1 22	14 26	1.3	2 7	2.6
20	6 6	17 22	0 23	1 16	14 28	1.6	2 8	2.3
10	5 53	17 35	0 22	1 13	14 30	1.8	2 8	2.1
0	5 40	17 47	0 22	1 12	14 32	2.0	2 8	1.9
10	5 28	17 60	0 22	1 14	14 34	2.2	2 9	1.7
20	5 15	18 13	0 23	1 19	14 36	2.4	2 9	1.5
30	4 59	18 29	0 26	1 29	14 39	2.6	2 10	1.3
35	4 50	18 38	0 28	1 36	14 40	2.8	2 10	1.2
40	4 40	18 49	0 30	1 47	14 42	2.9	2 10	1.0
45	4 28	19 1	0 33	2 3	14 43	3.1	2 11	.8
50	4 13	19 16	0 38	2 30	14 46	3.4	2 11	.6
55	3 54	19 35	0 45	: ::	14 48	3.6	2 12	.4
60	3 28	20 1	0 58	: ::	14 52	4.0	2 13	.1
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	16 9.8	-.2	16.2	$T_{\overline{m}}$	20 43	2.0	57.6	15.7
12	16 7.1	$T_{\overline{m}_\odot}$	11 h 43.9 min	Starost 11.0 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 27	.1	95	-3.9	♃	16 2	.0	70	-1.9
♂	12 15	.1	128	1.5	♄	8 8	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	184 1.1	-17 11.0	49 31.1	143 1.8	-25 24.4	176 26.2	-19 20.2
2	214 .9	-17 12.4	79 36.0	173 .1	-25 24.7	206 27.5	-19 21.1
4	244 .8	-17 13.8	109 41.0	202 58.4	-25 25.0	236 28.8	-19 21.9
6	274 .7	-17 15.2	139 45.9	232 56.7	-25 25.3	266 30.1	-19 22.8
8	304 .6	-17 16.6	169 50.8	262 55.0	-25 25.6	296 31.3	-19 23.7
10	334 .4	-17 18.0	199 55.8	292 53.3	-25 25.9	326 32.6	-19 24.6
12	4 .3	-17 19.4	230 .7	322 51.6	-25 26.2	356 33.9	-19 25.5
14	34 .2	-17 20.8	260 5.6	352 49.9	-25 26.4	26 35.2	-19 26.4
16	64 .0	-17 22.2	290 10.5	22 48.2	-25 26.7	56 36.5	-19 27.3
18	93 59.9	-17 23.6	320 15.5	52 46.5	-25 27.0	86 37.8	-19 28.2
20	123 59.8	-17 24.9	350 20.4	82 44.8	-25 27.2	116 39.1	-19 29.0
22	153 59.6	-17 26.3	20 25.3	112 43.1	-25 27.5	146 40.3	-19 29.9
Δ	-1	-7		-9	-1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	47 35.8	124	5 2.0	155	119 40.7	-22 32.9	238 30.8	5 51.7
2	76 38.5	122	5 33.1	155	149 44.8	-22 32.8	268 35.3	5 51.5
4	105 41.0	121	6 4.2	155	179 48.8	-22 32.7	298 39.9	5 51.4
6	134 43.2	119	6 35.2	155	209 52.8	-22 32.6	328 44.4	5 51.2
8	163 45.0	118	7 6.1	155	239 56.8	-22 32.5	358 48.9	5 51.1
10	192 46.6	116	7 37.0	154	270 .9	-22 32.4	28 53.5	5 50.9
12	221 47.8	114	8 7.9	154	300 4.9	-22 32.3	58 58.0	5 50.8
14	250 48.7	113	8 38.6	153	330 8.9	-22 32.2	89 2.5	5 50.6
16	279 49.2	111	9 9.3	153	0 12.9	-22 32.1	119 7.1	5 50.5
18	308 49.4	109	9 39.9	152	30 16.9	-22 31.9	149 11.6	5 50.3
20	337 49.2	107	10 10.3	151	60 21.0	-22 31.8	179 16.1	5 50.2
22	6 48.7	105	10 40.6	151	90 25.0	-22 31.7	209 20.7	5 50.0
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 46	15 41	0 48	2 27	14 17	.1	3 38	4.1
55	7 23	16 5	0 40	2 6	14 28	.5	3 30	3.7
50	7 5	16 22	0 35	1 52	14 36	.8	3 24	3.4
45	6 51	16 36	0 31	1 41	14 43	1.0	3 19	3.2
40	6 40	16 48	0 29	1 33	14 49	1.2	3 15	3.0
35	6 30	16 58	0 27	1 27	14 54	1.4	3 12	2.9
30	6 21	17 6	0 25	1 22	14 59	1.5	3 9	2.7
20	6 6	17 22	0 23	1 16	15 6	1.7	3 3	2.5
10	5 53	17 35	0 22	1 13	15 13	1.9	2 59	2.3
0	5 40	17 47	0 22	1 12	15 20	2.1	2 55	2.1
10	5 28	18 0	0 22	1 14	15 27	2.3	2 50	1.9
20	5 14	18 14	0 23	1 19	15 34	2.6	2 46	1.6
30	4 59	18 30	0 26	1 29	15 42	2.8	2 41	1.4
35	4 49	18 39	0 28	1 37	15 47	2.9	2 38	1.3
40	4 39	18 50	0 30	1 48	15 52	3.1	2 35	1.1
45	4 26	19 2	0 33	2 4	15 58	3.3	2 31	.9
50	4 11	19 18	0 38	2 32	16 6	3.6	2 26	.7
55	3 52	19 37	0 46	: ::	16 16	3.9	2 21	.4
60	3 26	20 4	0 59	: ::	16 28	4.3	2 14	.1
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	16 4.4	-.3	16.2	$T_{\overline{m}}$	21 32	2.2	58.5	15.9
12	16 1.3	$T_{\overline{m}_\odot}$	11 h 44.0 min	Starost 12.0 d		Faza ◐		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 29	.1	94	-3.9	♃	15 59	.0	70	-1.9
♂	12 14	.1	127	1.5	♄	8 5	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 59.5	-17 27.7	50 30.2	142 41.4	-25 27.7	176 41.6	-19 30.8
2	213 59.4	-17 29.1	80 35.2	172 39.7	-25 28.0	206 42.9	-19 31.7
4	243 59.2	-17 30.4	110 40.1	202 38.0	-25 28.2	236 44.2	-19 32.6
6	273 59.1	-17 31.8	140 45.0	232 36.3	-25 28.5	266 45.5	-19 33.5
8	303 58.9	-17 33.2	170 50.0	262 34.6	-25 28.7	296 46.7	-19 34.3
10	333 58.8	-17 34.5	200 54.9	292 32.9	-25 28.9	326 48.0	-19 35.2
12	3 58.6	-17 35.9	230 59.8	322 31.2	-25 29.1	356 49.3	-19 36.1
14	33 58.5	-17 37.3	261 4.7	352 29.4	-25 29.4	26 50.6	-19 37.0
16	63 58.3	-17 38.6	291 9.7	22 27.7	-25 29.6	56 51.8	-19 37.8
18	93 58.2	-17 40.0	321 14.6	52 26.0	-25 29.8	86 53.1	-19 38.7
20	123 58.0	-17 41.3	351 19.5	82 24.3	-25 30.0	116 54.4	-19 39.6
22	153 57.9	-17 42.7	21 24.5	112 22.6	-25 30.2	146 55.7	-19 40.4
Δ	-1	-7		-9	-1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	35 47.7	103	11 10.7	150	120 29.0	-22 31.6	239 25.2	5 49.9
2	64 46.3	101	11 40.7	149	150 33.0	-22 31.5	269 29.7	5 49.8
4	93 44.6	99	12 10.5	148	180 37.0	-22 31.4	299 34.3	5 49.6
6	122 42.4	97	12 40.1	147	210 41.0	-22 31.3	329 38.8	5 49.5
8	151 39.8	95	13 9.4	146	240 45.1	-22 31.2	359 43.4	5 49.3
10	180 36.8	93	13 38.6	145	270 49.1	-22 31.0	29 47.9	5 49.2
12	209 33.3	90	14 7.5	143	300 53.1	-22 30.9	59 52.4	5 49.0
14	238 29.4	88	14 36.2	142	330 57.1	-22 30.8	89 57.0	5 48.9
16	267 25.0	86	15 4.5	140	1 1.1	-22 30.7	120 1.5	5 48.7
18	296 20.2	83	15 32.6	139	31 5.1	-22 30.6	150 6.1	5 48.6
20	325 14.8	81	16 .4	137	61 9.1	-22 30.5	180 10.6	5 48.4
22	354 9.1	79	16 27.8	136	91 13.1	-22 30.4	210 15.1	5 48.3
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 49	15 39	0 48	2 28	14 20	.3	5 17	4.4
55	7 25	16 3	0 40	2 7	14 40	.7	4 60	4.0
50	7 7	16 21	0 35	1 52	14 55	1.0	4 46	3.6
45	6 53	16 35	0 31	1 41	15 8	1.3	4 36	3.4
40	6 41	16 47	0 29	1 33	15 18	1.4	4 27	3.2
35	6 31	16 57	0 27	1 27	15 27	1.6	4 20	3.0
30	6 22	17 6	0 25	1 22	15 35	1.7	4 14	2.9
20	6 7	17 21	0 23	1 16	15 48	2.0	4 2	2.6
10	5 53	17 35	0 22	1 13	16 0	2.2	3 53	2.4
0	5 41	17 48	0 22	1 12	16 11	2.3	3 44	2.2
10	5 28	18 1	0 22	1 14	16 23	2.5	3 35	2.0
20	5 14	18 15	0 23	1 19	16 35	2.7	3 25	1.8
30	4 58	18 31	0 26	1 29	16 49	3.0	3 15	1.6
35	4 49	18 40	0 28	1 37	16 57	3.1	3 8	1.5
40	4 38	18 51	0 30	1 48	17 7	3.3	3 1	1.3
45	4 25	19 4	0 34	2 5	17 18	3.5	2 53	1.1
50	4 10	19 19	0 38	2 34	17 31	3.7	2 44	.9
55	3 50	19 39	0 46	: ::	17 49	4.1	2 32	.6
60	3 23	20 7	0 60	: ::	18 12	4.6	2 16	.2
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 58.2	-.3	16.2	$T_{\overline{m}}$	22 24	2.4	59.4	16.2
12	15 54.6	$T_{\overline{m}_\odot}$	11 h 44.1 min	Starost 13.0 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 30	.1	92	-3.9	♃	15 56	.0	70	-1.9
♂	12 13	.1	126	1.5	♄	8 1	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 57.7	-17 44.0	51 29.4	142 20.9	-25 30.4	176 56.9	-19 41.3
2	213 57.6	-17 45.4	81 34.3	172 19.2	-25 30.5	206 58.2	-19 42.2
4	243 57.4	-17 46.7	111 39.2	202 17.5	-25 30.7	236 59.5	-19 43.0
6	273 57.2	-17 48.1	141 44.2	232 15.8	-25 30.9	267 .7	-19 43.9
8	303 57.1	-17 49.4	171 49.1	262 14.1	-25 31.1	297 2.0	-19 44.8
10	333 56.9	-17 50.8	201 54.0	292 12.4	-25 31.2	327 3.3	-19 45.6
12	3 56.8	-17 52.1	231 59.0	322 10.7	-25 31.4	357 4.5	-19 46.5
14	33 56.6	-17 53.4	262 3.9	352 9.0	-25 31.5	27 5.8	-19 47.4
16	63 56.4	-17 54.8	292 8.8	22 7.3	-25 31.7	57 7.0	-19 48.2
18	93 56.3	-17 56.1	322 13.7	52 5.6	-25 31.8	87 8.3	-19 49.1
20	123 56.1	-17 57.4	352 18.7	82 3.9	-25 32.0	117 9.6	-19 49.9
22	153 55.9	-17 58.8	22 23.6	112 2.2	-25 32.1	147 10.8	-19 50.8
Δ	-1	-7		-9	-1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	23 2.8	76	16 54.9	134	121 17.1	-22 30.3	240 19.7	5 48.2
2	51 56.1	74	17 21.7	132	151 21.2	-22 30.1	270 24.2	5 48.0
4	80 48.8	71	17 48.0	130	181 25.2	-22 30.0	300 28.8	5 47.9
6	109 41.1	69	18 14.0	128	211 29.2	-22 29.9	330 33.3	5 47.7
8	138 32.9	66	18 39.6	126	241 33.2	-22 29.8	0 37.9	5 47.6
10	167 24.2	64	19 4.7	123	271 37.2	-22 29.7	30 42.4	5 47.4
12	196 15.0	62	19 29.3	121	301 41.2	-22 29.6	60 46.9	5 47.3
14	225 5.3	59	19 53.5	119	331 45.2	-22 29.5	90 51.5	5 47.1
16	253 55.1	57	20 17.3	116	1 49.2	-22 29.3	120 56.0	5 47.0
18	282 44.5	54	20 40.5	113	31 53.2	-22 29.2	151 .6	5 46.9
20	311 33.3	52	21 3.2	111	61 57.2	-22 29.1	181 5.1	5 46.7
22	340 21.6	49	21 25.3	108	92 1.2	-22 29.0	211 9.7	5 46.6
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 51	15 36	0 48	2 28	14 26	.5	7 4	4.7
55	7 27	16 1	0 40	2 7	14 57	1.1	6 35	4.1
50	7 8	16 19	0 35	1 52	15 20	1.4	6 13	3.7
45	6 54	16 34	0 32	1 41	15 38	1.6	5 57	3.5
40	6 42	16 46	0 29	1 33	15 53	1.8	5 44	3.3
35	6 32	16 56	0 27	1 27	16 5	1.9	5 32	3.1
30	6 23	17 5	0 25	1 22	16 16	2.1	5 23	3.0
20	6 7	17 21	0 23	1 16	16 35	2.3	5 6	2.8
10	5 54	17 35	0 22	1 13	16 52	2.4	4 51	2.6
0	5 41	17 48	0 22	1 12	17 8	2.6	4 37	2.5
10	5 28	18 1	0 22	1 14	17 23	2.7	4 24	2.3
20	5 14	18 15	0 23	1 20	17 40	2.9	4 9	2.1
30	4 57	18 31	0 26	1 30	18 0	3.1	3 53	1.9
35	4 48	18 41	0 28	1 37	18 12	3.2	3 44	1.8
40	4 37	18 52	0 30	1 49	18 25	3.3	3 33	1.6
45	4 24	19 5	0 34	2 6	18 41	3.5	3 20	1.4
50	4 8	19 21	0 39	2 36	19 1	3.7	3 5	1.2
55	3 48	19 41	0 46	: ::	19 26	4.1	2 46	.8
60	3 21	20 9	1 0	: ::	20 3	4.7	2 20	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 51.1	-.3	16.2	$T_{\overline{m}}$	23 22	2.6	60.2	16.4
12	15 47.1	$T_{\overline{m}_\odot}$	11 h 44.2 min	Starost 14.0 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 31	.1	91	-3.9	♃	15 53	.0	70	-1.9
♂	12 12	.1	125	1.5	♄	7 57	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 55.7	-18 .1	52 28.5	142 .5	-25 32.2	177 12.1	-19 51.6
2	213 55.6	-18 1.4	82 33.5	171 58.8	-25 32.4	207 13.3	-19 52.5
4	243 55.4	-18 2.7	112 38.4	201 57.1	-25 32.5	237 14.6	-19 53.3
6	273 55.2	-18 4.1	142 43.3	231 55.4	-25 32.6	267 15.8	-19 54.2
8	303 55.0	-18 5.4	172 48.2	261 53.7	-25 32.7	297 17.1	-19 55.0
10	333 54.8	-18 6.7	202 53.2	291 52.0	-25 32.8	327 18.3	-19 55.9
12	3 54.7	-18 8.0	232 58.1	321 50.3	-25 32.9	357 19.6	-19 56.7
14	33 54.5	-18 9.3	263 3.0	351 48.6	-25 33.0	27 20.8	-19 57.6
16	63 54.3	-18 10.6	293 8.0	21 46.9	-25 33.1	57 22.1	-19 58.4
18	93 54.1	-18 11.9	323 12.9	51 45.2	-25 33.2	87 23.3	-19 59.3
20	123 53.9	-18 13.2	353 17.8	81 43.5	-25 33.2	117 24.6	-20 .1
22	153 53.7	-18 14.5	23 22.7	111 41.8	-25 33.3	147 25.8	-20 1.0
Δ	-1	-7		-9	0	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	9 9.5	47	21 46.9	105	122 5.2	-22 28.9	241 14.2	5 46.4
2	37 56.9	45	22 7.9	102	152 9.2	-22 28.8	271 18.8	5 46.3
4	66 43.8	42	22 28.3	99	182 13.2	-22 28.6	301 23.3	5 46.2
6	95 30.3	40	22 48.1	96	212 17.2	-22 28.5	331 27.9	5 46.0
8	124 16.3	38	23 7.3	93	242 21.2	-22 28.4	1 32.4	5 45.9
10	153 1.8	36	23 25.9	89	272 25.2	-22 28.3	31 37.0	5 45.7
12	181 46.9	34	23 43.8	86	302 29.2	-22 28.2	61 41.5	5 45.6
14	210 31.7	31	24 1.0	83	332 33.1	-22 28.1	91 46.1	5 45.5
16	239 16.0	30	24 17.5	79	2 37.1	-22 27.9	121 50.6	5 45.3
18	267 59.9	28	24 33.3	76	32 41.1	-22 27.8	151 55.2	5 45.2
20	296 43.4	26	24 48.4	72	62 45.1	-22 27.7	181 59.7	5 45.0
22	325 26.5	24	25 2.8	68	92 49.1	-22 27.6	212 4.3	5 44.9
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 54	15 34	0 49	2 29	14 38	1.1	8 56	4.5
55	7 29	15 59	0 41	2 7	15 23	1.7	8 12	3.9
50	7 10	16 18	0 35	1 53	15 54	2.0	7 43	3.6
45	6 55	16 33	0 32	1 42	16 17	2.1	7 21	3.4
40	6 43	16 45	0 29	1 33	16 36	2.3	7 3	3.3
35	6 33	16 56	0 27	1 27	16 52	2.4	6 48	3.1
30	6 24	17 5	0 25	1 22	17 6	2.4	6 35	3.1
20	6 8	17 21	0 23	1 16	17 29	2.5	6 13	2.9
10	5 54	17 35	0 22	1 13	17 50	2.6	5 54	2.8
0	5 41	17 48	0 22	1 12	18 9	2.7	5 36	2.7
10	5 28	18 1	0 22	1 15	18 29	2.8	5 19	2.5
20	5 13	18 16	0 24	1 20	18 49	2.9	4 60	2.4
30	4 57	18 32	0 26	1 30	19 14	3.0	4 38	2.2
35	4 47	18 42	0 28	1 38	19 28	3.1	4 26	2.1
40	4 36	18 53	0 30	1 49	19 45	3.1	4 11	2.0
45	4 23	19 7	0 34	2 6	20 5	3.2	3 54	1.9
50	4 7	19 23	0 39	2 38	20 30	3.4	3 33	1.7
55	3 46	19 44	0 47	: ::	21 4	3.6	3 6	1.3
60	3 18	20 12	1 1	: ::	21 56	4.1	2 28	.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 43.1	-.4	16.2	$T_{\overline{m}}$	. . .	1.0	60.8	16.6
12	15 38.7	$T_{\overline{m}_\odot}$	11 h 44.4 min	Starost 15.0 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 33	.1	90	-3.9	♃	15 50	.0	70	-1.9
♂	12 11	.1	125	1.4	♄	7 54	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 53.5	-18 15.8	53 27.7	141 40.1	-25 33.4	177 27.1	-20 1.8
2	213 53.4	-18 17.1	83 32.6	171 38.4	-25 33.4	207 28.3	-20 2.6
4	243 53.2	-18 18.4	113 37.5	201 36.7	-25 33.5	237 29.6	-20 3.5
6	273 53.0	-18 19.7	143 42.5	231 35.0	-25 33.5	267 30.8	-20 4.3
8	303 52.8	-18 21.0	173 47.4	261 33.3	-25 33.6	297 32.0	-20 5.2
10	333 52.6	-18 22.3	203 52.3	291 31.6	-25 33.6	327 33.3	-20 6.0
12	3 52.4	-18 23.6	233 57.2	321 29.9	-25 33.7	357 34.5	-20 6.8
14	33 52.2	-18 24.9	264 2.2	351 28.2	-25 33.7	27 35.8	-20 7.7
16	63 52.0	-18 26.2	294 7.1	21 26.5	-25 33.7	57 37.0	-20 8.5
18	93 51.8	-18 27.4	324 12.0	51 24.8	-25 33.7	87 38.2	-20 9.3
20	123 51.6	-18 28.7	354 16.9	81 23.1	-25 33.8	117 39.5	-20 10.2
22	153 51.3	-18 30.0	24 21.9	111 21.4	-25 33.8	147 40.7	-20 11.0
Δ	-1	-6		-8	0	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	354 9.4	22	25 16.4	64	122 53.1	-22 27.5	242 8.8	5 44.8
2	22 51.9	21	25 29.2	60	152 57.1	-22 27.3	272 13.4	5 44.6
4	51 34.1	20	25 41.3	57	183 1.1	-22 27.2	302 17.9	5 44.5
6	80 16.0	18	25 52.6	53	213 5.1	-22 27.1	332 22.5	5 44.3
8	108 57.6	17	26 3.2	49	243 9.0	-22 27.0	2 27.1	5 44.2
10	137 39.0	16	26 12.9	45	273 13.0	-22 26.9	32 31.6	5 44.1
12	166 20.2	15	26 21.8	41	303 17.0	-22 26.8	62 36.2	5 43.9
14	195 1.2	14	26 29.9	36	333 21.0	-22 26.6	92 40.7	5 43.8
16	223 42.0	13	26 37.2	32	3 25.0	-22 26.5	122 45.3	5 43.6
18	252 22.7	13	26 43.6	28	33 29.0	-22 26.4	152 49.8	5 43.5
20	281 3.3	12	26 49.2	24	63 32.9	-22 26.3	182 54.4	5 43.4
22	309 43.8	12	26 54.0	20	93 36.9	-22 26.2	212 59.0	5 43.2
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 56	15 32	0 49	2 29	15 6	2.5	10 43	3.4
55	7 31	15 58	0 41	2 8	16 4	2.6	9 45	3.2
50	7 12	16 17	0 35	1 53	16 42	2.7	9 9	3.1
45	6 57	16 32	0 32	1 42	17 9	2.7	8 42	3.0
40	6 44	16 44	0 29	1 34	17 30	2.7	8 21	3.0
35	6 34	16 55	0 27	1 27	17 48	2.7	8 3	2.9
30	6 24	17 4	0 25	1 23	18 4	2.7	7 48	2.9
20	6 8	17 20	0 23	1 16	18 30	2.8	7 23	2.9
10	5 54	17 35	0 22	1 13	18 53	2.8	7 0	2.8
0	5 41	17 48	0 22	1 13	19 15	2.8	6 40	2.8
10	5 28	18 2	0 22	1 15	19 36	2.8	6 19	2.7
20	5 13	18 16	0 24	1 20	19 59	2.8	5 57	2.7
30	4 56	18 33	0 26	1 30	20 26	2.8	5 32	2.6
35	4 46	18 43	0 28	1 38	20 42	2.8	5 17	2.6
40	4 35	18 54	0 31	1 50	21 0	2.7	4 60	2.5
45	4 22	19 8	0 34	2 7	21 22	2.7	4 39	2.4
50	4 6	19 24	0 39	2 40	21 51	2.7	4 13	2.3
55	3 45	19 46	0 47	: ::	22 30	2.7	3 38	2.1
60	3 16	20 15	1 2	: ::	23 35	2.5	2 44	1.6
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 34.4	-.4	16.2	$T_{\overline{m}}$	0 24	2.8	61.0	16.6
12	15 29.5	$T_{\overline{m}_\odot}$	11 h 44.5 min	Starost 16.0 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 34	.1	88	-3.9	♄	15 46	.0	69	-1.9
♂	12 10	.1	124	1.4	♃	7 50	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 51.1	-18 31.3	54 26.8	141 19.7	-25 33.8	177 41.9	-20 11.8
2	213 50.9	-18 32.5	84 31.7	171 18.0	-25 33.8	207 43.2	-20 12.6
4	243 50.7	-18 33.8	114 36.7	201 16.3	-25 33.8	237 44.4	-20 13.5
6	273 50.5	-18 35.1	144 41.6	231 14.6	-25 33.8	267 45.6	-20 14.3
8	303 50.3	-18 36.3	174 46.5	261 12.9	-25 33.7	297 46.8	-20 15.1
10	333 50.1	-18 37.6	204 51.4	291 11.2	-25 33.7	327 48.1	-20 15.9
12	3 49.8	-18 38.8	234 56.4	321 9.5	-25 33.7	357 49.3	-20 16.7
14	33 49.6	-18 40.1	265 1.3	351 7.8	-25 33.7	27 50.5	-20 17.6
16	63 49.4	-18 41.4	295 6.2	21 6.1	-25 33.6	57 51.7	-20 18.4
18	93 49.2	-18 42.6	325 11.2	51 4.4	-25 33.6	87 53.0	-20 19.2
20	123 49.0	-18 43.9	355 16.1	81 2.8	-25 33.6	117 54.2	-20 20.0
22	153 48.7	-18 45.1	25 21.0	111 1.1	-25 33.5	147 55.4	-20 20.8
Δ	-1	-6		-8	0	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	338 24.2	12	26 57.9	15	123 40.9	-22 26.0	243 3.5	5 43.1
2	7 4.6	12	27 1.0	11	153 44.9	-22 25.9	273 8.1	5 43.0
4	35 44.9	12	27 3.2	7	183 48.9	-22 25.8	303 12.6	5 42.8
6	64 25.3	12	27 4.6	3	213 52.8	-22 25.7	333 17.2	5 42.7
8	93 5.7	12	27 5.2	-1	243 56.8	-22 25.5	3 21.8	5 42.6
10	121 46.2	13	27 4.9	-6	274 .8	-22 25.4	33 26.3	5 42.4
12	150 26.8	14	27 3.7	-10	304 4.8	-22 25.3	63 30.9	5 42.3
14	179 7.5	14	27 1.8	-14	334 8.8	-22 25.2	93 35.5	5 42.2
16	207 48.4	15	26 59.0	-18	4 12.7	-22 25.1	123 40.0	5 42.0
18	236 29.4	16	26 55.3	-22	34 16.7	-22 24.9	153 44.6	5 41.9
20	265 10.7	17	26 50.9	-26	64 20.7	-22 24.8	183 49.1	5 41.7
22	293 52.1	19	26 45.6	-30	94 24.6	-22 24.7	213 53.7	5 41.6
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	7 59	15 30	0 49	2 30	16 5	3.9	12 4	1.7
55	7 33	15 56	0 41	2 8	17 7	3.5	11 1	2.2
50	7 13	16 16	0 36	1 53	17 46	3.3	10 23	2.3
45	6 58	16 31	0 32	1 42	18 14	3.1	9 54	2.4
40	6 45	16 44	0 29	1 34	18 36	3.1	9 32	2.5
35	6 35	16 54	0 27	1 28	18 54	3.0	9 14	2.5
30	6 25	17 4	0 25	1 23	19 10	2.9	8 58	2.6
20	6 9	17 20	0 23	1 16	19 37	2.8	8 31	2.6
10	5 55	17 35	0 22	1 13	19 60	2.7	8 8	2.7
0	5 41	17 48	0 22	1 13	20 21	2.7	7 46	2.7
10	5 27	18 2	0 22	1 15	20 42	2.6	7 25	2.8
20	5 13	18 17	0 24	1 20	21 5	2.5	7 1	2.8
30	4 56	18 34	0 26	1 30	21 32	2.4	6 34	2.9
35	4 46	18 44	0 28	1 39	21 48	2.3	6 18	2.9
40	4 34	18 56	0 31	1 50	22 6	2.2	5 60	2.9
45	4 21	19 9	0 34	2 8	22 28	2.1	5 37	3.0
50	4 4	19 26	0 39	2 42	22 56	2.0	5 8	3.0
55	3 43	19 48	0 47	: ::	23 34	1.7	4 29	3.1
60	3 14	20 17	1 3	: ::	.. ..	.0	3 23	3.3
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	15 24.7	-.4	16.2	$T_{\overline{m}}$	1 30	2.8	61.0	16.6
12	15 19.5	$T_{\overline{m}_\odot}$	11 h 44.7 min	Starost 17.0 d		Faza ○		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 36	.1	87	-4.0	♄	15 43	.0	69	-1.9
♂	12 9	.1	123	1.4	♃	7 47	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 48.5	-18 46.4	55 25.9	140 59.4	-25 33.4	177 56.6	-20 21.6
2	213 48.3	-18 47.6	85 30.9	170 57.7	-25 33.4	207 57.8	-20 22.4
4	243 48.1	-18 48.8	115 35.8	200 56.0	-25 33.3	237 59.1	-20 23.3
6	273 47.8	-18 50.1	145 40.7	230 54.3	-25 33.3	268 .3	-20 24.1
8	303 47.6	-18 51.3	175 45.7	260 52.6	-25 33.2	298 1.5	-20 24.9
10	333 47.4	-18 52.5	205 50.6	290 50.9	-25 33.1	328 2.7	-20 25.7
12	3 47.1	-18 53.8	235 55.5	320 49.2	-25 33.0	358 3.9	-20 26.5
14	33 46.9	-18 55.0	266 .4	350 47.6	-25 32.9	28 5.1	-20 27.3
16	63 46.6	-18 56.2	296 5.4	20 45.9	-25 32.8	58 6.3	-20 28.1
18	93 46.4	-18 57.5	326 10.3	50 44.2	-25 32.7	88 7.5	-20 28.9
20	123 46.2	-18 58.7	356 15.2	80 42.5	-25 32.6	118 8.7	-20 29.7
22	153 45.9	-18 59.9	26 20.2	110 40.8	-25 32.5	148 10.0	-20 30.5
Δ	-1	-6		-8	0	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	322 33.8	20	26 39.5	-34	124 28.6	-22 24.6	243 58.3	5 41.5
2	351 15.8	21	26 32.7	-38	154 32.6	-22 24.4	274 2.8	5 41.3
4	19 58.1	23	26 25.0	-42	184 36.6	-22 24.3	304 7.4	5 41.2
6	48 40.6	25	26 16.6	-46	214 40.5	-22 24.2	334 12.0	5 41.1
8	77 23.6	26	26 7.4	-50	244 44.5	-22 24.1	4 16.6	5 40.9
10	106 6.8	28	25 57.4	-54	274 48.5	-22 24.0	34 21.1	5 40.8
12	134 50.5	30	25 46.7	-57	304 52.4	-22 23.8	64 25.7	5 40.7
14	163 34.5	32	25 35.3	-61	334 56.4	-22 23.7	94 30.3	5 40.6
16	192 18.9	34	25 23.1	-64	5 .4	-22 23.6	124 34.8	5 40.4
18	221 3.8	36	25 10.2	-68	35 4.3	-22 23.5	154 39.4	5 40.3
20	249 49.1	39	24 56.7	-71	65 8.3	-22 23.3	184 44.0	5 40.2
22	278 34.8	41	24 42.4	-74	95 12.3	-22 23.2	214 48.5	5 40.0
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 1	15 28	0 49	2 31	17 39	4.5	12 46	.8
55	7 35	15 55	0 41	2 9	18 31	3.9	11 53	1.4
50	7 15	16 14	0 36	1 53	19 4	3.5	11 18	1.7
45	6 59	16 30	0 32	1 42	19 29	3.3	10 53	1.8
40	6 47	16 43	0 29	1 34	19 49	3.2	10 32	2.0
35	6 36	16 54	0 27	1 28	20 6	3.0	10 15	2.1
30	6 26	17 3	0 25	1 23	20 20	2.9	9 60	2.2
20	6 10	17 20	0 23	1 16	20 45	2.8	9 35	2.3
10	5 55	17 35	0 22	1 13	21 5	2.6	9 13	2.5
0	5 41	17 48	0 22	1 13	21 25	2.5	8 52	2.6
10	5 27	18 2	0 22	1 15	21 44	2.3	8 31	2.7
20	5 13	18 17	0 24	1 20	22 5	2.2	8 9	2.8
30	4 55	18 35	0 26	1 31	22 29	2.0	7 43	3.0
35	4 45	18 45	0 28	1 39	22 43	1.9	7 28	3.0
40	4 34	18 57	0 31	1 51	22 59	1.8	7 10	3.1
45	4 20	19 11	0 34	2 9	23 19	1.6	6 48	3.3
50	4 3	19 28	0 40	2 44	23 43	1.4	6 21	3.5
55	3 41	19 50	0 48	: ::	.. ..	.0	5 43	3.8
60	3 11	20 20	1 4	: ::	0 36	1.1	4 43	4.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 14.2	-.5	16.2	$T_{\overline{m}}$ 2 37	2.6	60.7	16.5
12	15 8.5	$T_{\overline{m}_\odot}$ 11 h 44.9 min		Starost 18.0 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 37	.1	86	-4.0	♃	15 40	.0	69	-1.9
♂	12 8	.1	123	1.4	♄	7 43	.0	189	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 45.7	-19 1.1	56 25.1	140 39.1	-25 32.4	178 11.2	-20 31.3
2	213 45.4	-19 2.3	86 30.0	170 37.5	-25 32.3	208 12.4	-20 32.1
4	243 45.2	-19 3.5	116 34.9	200 35.8	-25 32.1	238 13.6	-20 32.9
6	273 44.9	-19 4.8	146 39.9	230 34.1	-25 32.0	268 14.8	-20 33.7
8	303 44.7	-19 6.0	176 44.8	260 32.4	-25 31.9	298 16.0	-20 34.5
10	333 44.4	-19 7.2	206 49.7	290 30.7	-25 31.7	328 17.2	-20 35.3
12	3 44.2	-19 8.4	236 54.7	320 29.1	-25 31.6	358 18.4	-20 36.0
14	33 43.9	-19 9.6	266 59.6	350 27.4	-25 31.4	28 19.6	-20 36.8
16	63 43.7	-19 10.8	297 4.5	20 25.7	-25 31.3	58 20.8	-20 37.6
18	93 43.4	-19 12.0	327 9.4	50 24.0	-25 31.1	88 22.0	-20 38.4
20	123 43.2	-19 13.2	357 14.4	80 22.4	-25 30.9	118 23.2	-20 39.2
22	153 42.9	-19 14.3	27 19.3	110 20.7	-25 30.8	148 24.4	-20 40.0
Δ	-1	-6		-8	1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	307 21.0	43	24 27.5	-78	125 16.2	-22 23.1	244 53.1	5 39.9
2	336 7.6	46	24 12.0	-81	155 20.2	-22 23.0	274 57.7	5 39.8
4	4 54.7	48	23 55.8	-84	185 24.1	-22 22.8	305 2.3	5 39.6
6	33 42.4	51	23 39.0	-87	215 28.1	-22 22.7	335 6.8	5 39.5
8	62 30.5	53	23 21.6	-90	245 32.1	-22 22.6	5 11.4	5 39.4
10	91 19.1	56	23 3.7	-93	275 36.0	-22 22.5	35 16.0	5 39.2
12	120 8.2	58	22 45.1	-95	305 40.0	-22 22.3	65 20.6	5 39.1
14	148 57.8	61	22 26.0	-98	335 43.9	-22 22.2	95 25.1	5 39.0
16	177 47.9	63	22 6.4	-101	5 47.9	-22 22.1	125 29.7	5 38.9
18	206 38.6	66	21 46.2	-103	35 51.8	-22 21.9	155 34.3	5 38.7
20	235 29.7	68	21 25.5	-106	65 55.8	-22 21.8	185 38.9	5 38.6
22	264 21.4	71	21 4.4	-108	95 59.8	-22 21.7	215 43.4	5 38.5
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 4	15 26	0 50	2 31	19 26	4.4	13 4	.4
55	7 37	15 53	0 41	2 9	20 3	3.8	12 26	.9
50	7 16	16 13	0 36	1 54	20 29	3.5	11 58	1.2
45	7 1	16 29	0 32	1 42	20 49	3.3	11 37	1.4
40	6 48	16 42	0 29	1 34	21 5	3.1	11 20	1.6
35	6 37	16 53	0 27	1 28	21 19	2.9	11 5	1.7
30	6 27	17 3	0 25	1 23	21 31	2.8	10 53	1.8
20	6 10	17 20	0 23	1 17	21 51	2.6	10 31	2.0
10	5 55	17 35	0 22	1 13	22 8	2.4	10 12	2.2
0	5 41	17 49	0 22	1 13	22 24	2.2	9 54	2.4
10	5 27	18 3	0 22	1 15	22 40	2.1	9 36	2.5
20	5 12	18 18	0 24	1 21	22 57	1.9	9 16	2.7
30	4 55	18 36	0 26	1 31	23 17	1.7	8 54	2.9
35	4 45	18 46	0 28	1 39	23 28	1.5	8 41	3.0
40	4 33	18 58	0 31	1 51	23 41	1.4	8 25	3.2
45	4 19	19 12	0 34	2 10	23 57	1.2	8 7	3.3
50	4 2	19 29	0 40	2 47	.. ..	.0	7 44	3.6
55	3 40	19 52	0 48	: ::	0 15	1.1	7 13	3.9
60	3 9	20 23	1 5	: ::	1 2	.5	6 28	4.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	15 2.9	-.5	16.2	$T_{\overline{m}}$ 3 40	2.4	60.2	16.4
12	14 56.8	$T_{\overline{m}_\odot}$ 11 h 45.1 min		Starost 19.0 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 38	.1	84	-4.0	♃	15 37	.0	69	-1.9
♂	12 7	.1	122	1.4	♄	7 39	.0	188	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 42.6	-19 15.5	57 24.2	140 19.0	-25 30.6	178 25.6	-20 40.8
2	213 42.4	-19 16.7	87 29.1	170 17.3	-25 30.4	208 26.8	-20 41.5
4	243 42.1	-19 17.9	117 34.1	200 15.7	-25 30.2	238 27.9	-20 42.3
6	273 41.8	-19 19.1	147 39.0	230 14.0	-25 30.0	268 29.1	-20 43.1
8	303 41.6	-19 20.3	177 43.9	260 12.3	-25 29.8	298 30.3	-20 43.9
10	333 41.3	-19 21.4	207 48.9	290 10.7	-25 29.6	328 31.5	-20 44.7
12	3 41.0	-19 22.6	237 53.8	320 9.0	-25 29.4	358 32.7	-20 45.4
14	33 40.8	-19 23.8	267 58.7	350 7.3	-25 29.2	28 33.9	-20 46.2
16	63 40.5	-19 25.0	298 3.6	20 5.7	-25 29.0	58 35.1	-20 47.0
18	93 40.2	-19 26.1	328 8.6	50 4.0	-25 28.8	88 36.3	-20 47.7
20	123 39.9	-19 27.3	358 13.5	80 2.3	-25 28.5	118 37.4	-20 48.5
22	153 39.6	-19 28.5	28 18.4	110 .7	-25 28.3	148 38.6	-20 49.3
Δ	-1	-6		-8	1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	293 13.6	73	20 42.8	-110	126 3.7	-22 21.6	245 48.0	5 38.3
2	322 6.2	76	20 20.7	-113	156 7.7	-22 21.4	275 52.6	5 38.2
4	350 59.4	79	19 58.1	-115	186 11.6	-22 21.3	305 57.2	5 38.1
6	19 53.1	81	19 35.2	-117	216 15.6	-22 21.2	336 1.8	5 38.0
8	48 47.4	84	19 11.8	-119	246 19.5	-22 21.1	6 6.3	5 37.8
10	77 42.1	86	18 48.1	-121	276 23.5	-22 20.9	36 10.9	5 37.7
12	106 37.3	88	18 23.9	-123	306 27.4	-22 20.8	66 15.5	5 37.6
14	135 32.9	91	17 59.4	-124	336 31.4	-22 20.7	96 20.1	5 37.5
16	164 29.1	93	17 34.6	-126	6 35.3	-22 20.5	126 24.7	5 37.3
18	193 25.8	96	17 9.4	-128	36 39.3	-22 20.4	156 29.3	5 37.2
20	222 22.9	98	16 43.9	-129	66 43.2	-22 20.3	186 33.8	5 37.1
22	251 20.5	100	16 18.0	-131	96 47.2	-22 20.1	216 38.4	5 36.9
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 6	15 24	0 50	2 32	21 11	4.1	13 13	.2
55	7 38	15 51	0 42	2 9	21 35	3.7	12 46	.6
50	7 18	16 12	0 36	1 54	21 54	3.4	12 26	.9
45	7 2	16 28	0 32	1 43	22 8	3.1	12 10	1.1
40	6 49	16 41	0 29	1 34	22 20	2.9	11 57	1.3
35	6 38	16 53	0 27	1 28	22 29	2.8	11 46	1.4
30	6 28	17 2	0 25	1 23	22 38	2.7	11 36	1.6
20	6 11	17 20	0 23	1 17	22 53	2.4	11 19	1.8
10	5 56	17 35	0 22	1 13	23 6	2.2	11 4	2.0
0	5 42	17 49	0 22	1 13	23 18	2.0	10 50	2.1
10	5 27	18 3	0 22	1 15	23 30	1.9	10 36	2.3
20	5 12	18 19	0 24	1 21	23 43	1.7	10 21	2.5
30	4 54	18 37	0 26	1 31	23 57	1.4	10 3	2.7
35	4 44	18 47	0 28	1 40	. . . .	.0	9 53	2.9
40	4 32	18 59	0 31	1 52	. . . .	.0	9 41	3.0
45	4 18	19 13	0 35	2 11	. . . .	.0	9 27	3.2
50	4 0	19 31	0 40	2 49	0 16	1.0	9 10	3.5
55	3 38	19 54	0 49	: : :	0 40	.7	8 47	3.8
60	3 7	20 25	1 6	: : :	1 14	.2	8 16	4.3
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 50.7	-.5	16.2	$T_{\overline{m}}$	4 37	2.2	59.5	16.2
12	14 44.2	$T_{\overline{m}_\odot}$	11 h 45.3 min	Starost 20.0 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 40	.1	83	-4.0	♃	15 34	.0	69	-1.9
♂	12 6	.1	121	1.4	♄	7 36	.0	188	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 39.4	-19 29.6	58 23.4	139 59.0	-25 28.1	178 39.8	-20 50.1
2	213 39.1	-19 30.8	88 28.3	169 57.3	-25 27.8	208 41.0	-20 50.8
4	243 38.8	-19 31.9	118 33.2	199 55.7	-25 27.6	238 42.2	-20 51.6
6	273 38.5	-19 33.1	148 38.1	229 54.0	-25 27.3	268 43.3	-20 52.3
8	303 38.2	-19 34.2	178 43.1	259 52.4	-25 27.0	298 44.5	-20 53.1
10	333 37.9	-19 35.4	208 48.0	289 50.7	-25 26.8	328 45.7	-20 53.9
12	3 37.7	-19 36.5	238 52.9	319 49.0	-25 26.5	358 46.9	-20 54.6
14	33 37.4	-19 37.7	268 57.9	349 47.4	-25 26.2	28 48.1	-20 55.4
16	63 37.1	-19 38.8	299 2.8	19 45.7	-25 26.0	58 49.2	-20 56.1
18	93 36.8	-19 40.0	329 7.7	49 44.1	-25 25.7	88 50.4	-20 56.9
20	123 36.5	-19 41.1	359 12.6	79 42.4	-25 25.4	118 51.6	-20 57.7
22	153 36.2	-19 42.2	29 17.6	109 40.8	-25 25.1	148 52.7	-20 58.4
Δ	-1	-6		-8	1	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	280 18.5	102	15 51.9	-132	126 51.1	-22 20.0	246 43.0	5 36.8
2	309 17.0	105	15 25.5	-133	156 55.0	-22 19.9	276 47.6	5 36.7
4	338 15.9	107	14 58.9	-135	186 59.0	-22 19.8	306 52.2	5 36.6
6	7 15.2	109	14 32.0	-136	217 2.9	-22 19.6	336 56.8	5 36.5
8	36 15.0	111	14 4.8	-137	247 6.9	-22 19.5	7 1.4	5 36.3
10	65 15.2	113	13 37.5	-138	277 10.8	-22 19.4	37 5.9	5 36.2
12	94 15.7	115	13 9.9	-139	307 14.8	-22 19.2	67 10.5	5 36.1
14	123 16.7	117	12 42.1	-140	337 18.7	-22 19.1	97 15.1	5 36.0
16	152 18.0	119	12 14.1	-141	7 22.6	-22 19.0	127 19.7	5 35.8
18	181 19.7	120	11 46.0	-142	37 26.6	-22 18.8	157 24.3	5 35.7
20	210 21.8	122	11 17.7	-142	67 30.5	-22 18.7	187 28.9	5 35.6
22	239 24.2	124	10 49.2	-143	97 34.5	-22 18.6	217 33.5	5 35.5
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 9	15 22	0 50	2 32	22 49	3.8	13 17	.1
55	7 40	15 50	0 42	2 10	23 3	3.5	13 0	.4
50	7 20	16 11	0 36	1 54	23 14	3.2	12 47	.7
45	7 3	16 27	0 32	1 43	23 23	3.0	12 37	.9
40	6 50	16 41	0 29	1 34	23 30	2.8	12 28	1.1
35	6 39	16 52	0 27	1 28	23 36	2.7	12 20	1.2
30	6 29	17 2	0 26	1 23	23 42	2.5	12 14	1.4
20	6 11	17 19	0 23	1 17	23 51	2.3	12 2	1.6
10	5 56	17 35	0 22	1 14	23 59	2.1	11 52	1.8
0	5 42	17 49	0 22	1 13	. . . .	.0	11 42	2.0
10	5 27	18 4	0 22	1 15	. . . .	.0	11 32	2.2
20	5 12	18 19	0 24	1 21	. . . .	.0	11 21	2.4
30	4 54	18 37	0 26	1 32	. . . .	.0	11 9	2.6
35	4 43	18 48	0 28	1 40	0 6	1.3	11 2	2.7
40	4 31	19 0	0 31	1 52	0 15	1.2	10 54	2.9
45	4 17	19 15	0 35	2 12	0 26	1.0	10 44	3.1
50	3 59	19 33	0 40	2 52	0 40	.8	10 33	3.3
55	3 36	19 56	0 49	: : :	0 57	.5	10 18	3.6
60	3 5	20 28	1 7	: : :	1 19	.1	9 58	4.0
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	14 37.7	-.6	16.2	$T_{\overline{m}}$	5 30	2.0	58.7	16.0
12	14 30.7	$T_{\overline{m}_\odot}$	11 h 45.5 min	Starost 21.0 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 41	.1	82	-4.0	♃	15 31	.0	68	-1.9
♂	12 5	.1	120	1.4	♄	7 32	.0	188	1.1

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 35.9	-19 43.4	59 22.5	139 39.1	-25 24.8	178 53.9	-20 59.2
2	213 35.6	-19 44.5	89 27.4	169 37.5	-25 24.5	208 55.1	-20 59.9
4	243 35.3	-19 45.6	119 32.4	199 35.8	-25 24.2	238 56.2	-21 .7
6	273 35.0	-19 46.7	149 37.3	229 34.2	-25 23.9	268 57.4	-21 1.4
8	303 34.7	-19 47.8	179 42.2	259 32.5	-25 23.5	298 58.6	-21 2.2
10	333 34.4	-19 49.0	209 47.1	289 30.9	-25 23.2	328 59.7	-21 2.9
12	3 34.1	-19 50.1	239 52.1	319 29.2	-25 22.9	359 .9	-21 3.6
14	33 33.8	-19 51.2	269 57.0	349 27.6	-25 22.6	29 2.1	-21 4.4
16	63 33.5	-19 52.3	300 1.9	19 26.0	-25 22.2	59 3.2	-21 5.1
18	93 33.2	-19 53.4	330 6.9	49 24.3	-25 21.9	89 4.4	-21 5.9
20	123 32.9	-19 54.5	0 11.8	79 22.7	-25 21.5	119 5.5	-21 6.6
22	153 32.5	-19 55.6	30 16.7	109 21.0	-25 21.2	149 6.7	-21 7.4
Δ	-2	-6		-8	2	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	268 27.0	125	10 20.6	-144	127 38.4	-22 18.4	247 38.1	5 35.3
2	297 30.1	127	9 51.8	-144	157 42.3	-22 18.3	277 42.7	5 35.2
4	326 33.5	129	9 22.9	-145	187 46.3	-22 18.2	307 47.3	5 35.1
6	355 37.2	130	8 53.9	-145	217 50.2	-22 18.0	337 51.9	5 35.0
8	24 41.2	131	8 24.9	-146	247 54.1	-22 17.9	7 56.4	5 34.9
10	53 45.5	133	7 55.7	-146	277 58.1	-22 17.8	38 1.0	5 34.7
12	82 50.1	134	7 26.4	-147	308 2.0	-22 17.6	68 5.6	5 34.6
14	111 54.9	135	6 57.1	-147	338 5.9	-22 17.5	98 10.2	5 34.5
16	141 .0	137	6 27.7	-147	8 9.9	-22 17.4	128 14.8	5 34.4
18	170 5.4	138	5 58.2	-147	38 13.8	-22 17.2	158 19.4	5 34.3
20	199 10.9	139	5 28.8	-148	68 17.7	-22 17.1	188 24.0	5 34.1
22	228 16.7	140	4 59.2	-148	98 21.7	-22 17.0	218 28.6	5 34.0
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 11	15 20	0 51	2 33	. . . .	.0	13 20	.1
55	7 42	15 49	0 42	2 10	. . . .	.0	13 11	.4
50	7 21	16 10	0 36	1 54	. . . .	.0	13 4	.6
45	7 5	16 26	0 32	1 43	. . . .	.0	12 59	.8
40	6 51	16 40	0 29	1 35	. . . .	.0	12 54	1.0
35	6 40	16 52	0 27	1 28	. . . .	.0	12 50	1.1
30	6 29	17 2	0 26	1 23	. . . .	.0	12 46	1.3
20	6 12	17 19	0 23	1 17	. . . .	.0	12 40	1.5
10	5 57	17 35	0 22	1 14	. . . .	.0	12 34	1.7
0	5 42	17 49	0 22	1 13	0 7	1.9	12 29	1.9
10	5 28	18 4	0 22	1 15	0 15	1.7	12 24	2.0
20	5 12	18 20	0 24	1 21	0 23	1.5	12 18	2.2
30	4 54	18 38	0 26	1 32	0 32	1.3	12 11	2.5
35	4 43	18 49	0 28	1 40	0 37	1.2	12 7	2.6
40	4 31	19 1	0 31	1 53	0 43	1.0	12 3	2.8
45	4 16	19 16	0 35	2 13	0 50	.8	11 58	2.9
50	3 58	19 34	0 40	2 54	0 58	.6	11 52	3.1
55	3 35	19 58	0 49	: ::	1 9	.4	11 44	3.4
60	3 3	20 31	1 8	: ::	1 22	.1	11 34	3.8
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	14 23.8	-.6	16.2	$T_{\overline{m}}$ 6 18	1.9	57.9	15.8
12	14 16.4	$T_{\overline{m}_\odot}$ 11 h 45.7 min		Starost 22.0 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 42	.1	80	-4.0	♄	15 27	.0	68	-1.9
♂	12 4	.1	120	1.4	♃	7 28	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 32.2	-19 56.7	60 21.6	139 19.4	-25 20.8	179 7.9	-21 8.1
2	213 31.9	-19 57.8	90 26.6	169 17.8	-25 20.4	209 9.0	-21 8.8
4	243 31.6	-19 58.9	120 31.5	199 16.1	-25 20.1	239 10.2	-21 9.6
6	273 31.3	-20 .0	150 36.4	229 14.5	-25 19.7	269 11.3	-21 10.3
8	303 31.0	-20 1.1	180 41.4	259 12.9	-25 19.3	299 12.5	-21 11.0
10	333 30.6	-20 2.2	210 46.3	289 11.2	-25 18.9	329 13.6	-21 11.8
12	3 30.3	-20 3.3	240 51.2	319 9.6	-25 18.5	359 14.8	-21 12.5
14	33 30.0	-20 4.4	270 56.1	349 8.0	-25 18.1	29 15.9	-21 13.2
16	63 29.7	-20 5.4	301 1.1	19 6.3	-25 17.7	59 17.1	-21 13.9
18	93 29.3	-20 6.5	331 6.0	49 4.7	-25 17.3	89 18.2	-21 14.7
20	123 29.0	-20 7.6	1 10.9	79 3.1	-25 16.9	119 19.4	-21 15.4
22	153 28.7	-20 8.7	31 15.8	109 1.5	-25 16.5	149 20.5	-21 16.1
Δ	-2	-5		-8	2	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	257 22.7	141	4 29.7	-148	128 25.6	-22 16.8	248 33.2	5 33.9
2	286 28.9	142	4 .1	-148	158 29.5	-22 16.7	278 37.8	5 33.8
4	315 35.3	143	3 30.5	-148	188 33.4	-22 16.6	308 42.4	5 33.7
6	344 41.9	144	3 .9	-148	218 37.4	-22 16.4	338 47.0	5 33.5
8	13 48.6	144	2 31.4	-148	248 41.3	-22 16.3	8 51.6	5 33.4
10	42 55.5	145	2 1.8	-148	278 45.2	-22 16.2	38 56.2	5 33.3
12	72 2.5	146	1 32.3	-148	308 49.1	-22 16.0	69 .8	5 33.2
14	101 9.7	147	1 2.8	-147	338 53.1	-22 15.9	99 5.4	5 33.1
16	130 17.0	147	0 33.3	-147	8 57.0	-22 15.8	129 10.0	5 33.0
18	159 24.4	148	0 3.9	-147	39 .9	-22 15.6	159 14.6	5 32.8
20	188 31.9	148	- 0 25.5	-147	69 4.8	-22 15.5	189 19.2	5 32.7
22	217 39.6	149	- 0 54.8	-146	99 8.8	-22 15.4	219 23.8	5 32.6
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 13	15 18	0 51	2 34	0 22	3.7	13 21	.1
55	7 44	15 47	0 42	2 10	0 27	3.3	13 20	.4
50	7 23	16 9	0 36	1 55	0 32	3.1	13 19	.6
45	7 6	16 26	0 32	1 43	0 35	2.9	13 18	.8
40	6 52	16 39	0 29	1 35	0 38	2.7	13 18	.9
35	6 41	16 51	0 27	1 28	0 40	2.6	13 17	1.1
30	6 30	17 1	0 26	1 23	0 42	2.4	13 16	1.2
20	6 13	17 19	0 23	1 17	0 46	2.2	13 15	1.4
10	5 57	17 35	0 22	1 14	0 49	2.0	13 14	1.6
0	5 42	17 50	0 22	1 13	0 53	1.8	13 13	1.8
10	5 28	18 4	0 23	1 16	0 56	1.6	13 13	2.0
20	5 12	18 20	0 24	1 21	0 59	1.4	13 12	2.2
30	4 53	18 39	0 26	1 32	1 3	1.2	13 10	2.4
35	4 42	18 50	0 28	1 41	1 5	1.1	13 10	2.5
40	4 30	19 3	0 31	1 54	1 7	.9	13 9	2.7
45	4 15	19 17	0 35	2 14	1 10	.8	13 8	2.8
50	3 57	19 36	0 41	2 57	1 14	.6	13 7	3.0
55	3 33	19 60	0 50	: ::	1 18	.4	13 6	3.3
60	3 1	20 33	1 9	: ::	1 23	.1	13 4	3.6
S								

SUNCE				MESEC			
UT	$e = T_p - UT$	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	14 9.1	-.6	16.2	$T_{\overline{m}}$ 7 3	1.8	57.1	15.6
12	14 1.3	$T_{\overline{m}_\odot}$ 11 h 46.0 min		Starost 23.0 d		Faza ◑	

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 44	.1	79	-4.0	♄	15 24	.0	68	-1.9
♂	12 3	.1	119	1.4	♃	7 25	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 28.3	-20 9.7	61 20.8	138 59.8	-25 16.1	179 21.7	-21 16.8
2	213 28.0	-20 10.8	91 25.7	168 58.2	-25 15.7	209 22.8	-21 17.5
4	243 27.7	-20 11.9	121 30.6	198 56.6	-25 15.2	239 23.9	-21 18.3
6	273 27.3	-20 12.9	151 35.6	228 55.0	-25 14.8	269 25.1	-21 19.0
8	303 27.0	-20 14.0	181 40.5	258 53.3	-25 14.4	299 26.2	-21 19.7
10	333 26.7	-20 15.0	211 45.4	288 51.7	-25 13.9	329 27.4	-21 20.4
12	3 26.3	-20 16.1	241 50.3	318 50.1	-25 13.5	359 28.5	-21 21.1
14	33 26.0	-20 17.2	271 55.3	348 48.5	-25 13.0	29 29.6	-21 21.8
16	63 25.6	-20 18.2	302 .2	18 46.9	-25 12.5	59 30.8	-21 22.5
18	93 25.3	-20 19.2	332 5.1	48 45.3	-25 12.1	89 31.9	-21 23.3
20	123 25.0	-20 20.3	2 10.1	78 43.7	-25 11.6	119 33.0	-21 24.0
22	153 24.6	-20 21.3	32 15.0	108 42.1	-25 11.1	149 34.2	-21 24.7
Δ	-2	-5		-8	2	6	-4

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	246 47.3	149 - 1	24.0	-146	129 12.7	-22 15.2	249 28.4	5 32.5
2	275 55.1	149 - 1	53.2	-145	159 16.6	-22 15.1	279 33.0	5 32.4
4	305 2.9	150 - 2	22.2	-145	189 20.5	-22 14.9	309 37.7	5 32.3
6	334 10.8	150 - 2	51.2	-144	219 24.4	-22 14.8	339 42.3	5 32.1
8	3 18.8	150 - 3	20.1	-144	249 28.4	-22 14.7	9 46.9	5 32.0
10	32 26.8	150 - 3	48.9	-143	279 32.3	-22 14.5	39 51.5	5 31.9
12	61 34.9	150 - 4	17.6	-143	309 36.2	-22 14.4	69 56.1	5 31.8
14	90 42.9	150 - 4	46.1	-142	339 40.1	-22 14.2	100 .7	5 31.7
16	119 51.0	150 - 5	14.6	-141	9 44.0	-22 14.1	130 5.3	5 31.6
18	148 59.1	150 - 5	42.9	-141	39 47.9	-22 14.0	160 9.9	5 31.5
20	178 7.1	150 - 6	11.0	-140	69 51.9	-22 13.8	190 14.5	5 31.3
22	207 15.2	150 - 6	39.0	-139	99 55.8	-22 13.7	220 19.1	5 31.2
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 16	15 16	0 51	2 34	1 50	3.6	13 23	.1
55	7 46	15 46	0 42	2 11	1 48	3.3	13 29	.4
50	7 24	16 8	0 36	1 55	1 46	3.0	13 33	.6
45	7 7	16 25	0 32	1 43	1 44	2.8	13 37	.8
40	6 53	16 39	0 29	1 35	1 43	2.6	13 40	1.0
35	6 41	16 51	0 27	1 28	1 42	2.5	13 43	1.1
30	6 31	17 1	0 26	1 24	1 41	2.4	13 45	1.2
20	6 13	17 19	0 23	1 17	1 39	2.2	13 49	1.4
10	5 57	17 35	0 22	1 14	1 37	2.0	13 53	1.6
0	5 43	17 50	0 22	1 13	1 36	1.8	13 57	1.8
10	5 28	18 5	0 23	1 16	1 35	1.6	14 0	2.0
20	5 12	18 21	0 24	1 21	1 33	1.4	14 4	2.2
30	4 53	18 40	0 27	1 32	1 32	1.2	14 8	2.4
35	4 42	18 51	0 29	1 41	1 31	1.1	14 10	2.5
40	4 29	19 4	0 31	1 54	1 30	.9	14 13	2.6
45	4 14	19 19	0 35	2 15	1 29	.8	14 16	2.8
50	3 56	19 37	0 41	3 0	1 28	.6	14 20	3.0
55	3 32	20 2	0 50	: ::	1 27	.4	14 25	3.3
60	2 59	20 36	1 11	: ::	1 25	.1	14 31	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 53.6	-.7	16.2	$T_{\overline{m}}$	7 46	1.8	56.4	15.4
12	13 45.4	$T_{\overline{m}_\odot}$	11 h 46.2 min	Starost 24.0 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 45	.1	78	-4.0	♃	15 21	.0	68	-1.9
♂	12 2	.1	118	1.4	♄	7 21	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 24.3	-20 22.4	62 19.9	138 40.5	-25 10.7	179 35.3	-21 25.4
2	213 23.9	-20 23.4	92 24.8	168 38.8	-25 10.2	209 36.4	-21 26.1
4	243 23.6	-20 24.4	122 29.8	198 37.2	-25 9.7	239 37.6	-21 26.8
6	273 23.2	-20 25.5	152 34.7	228 35.6	-25 9.2	269 38.7	-21 27.5
8	303 22.9	-20 26.5	182 39.6	258 34.0	-25 8.7	299 39.8	-21 28.2
10	333 22.5	-20 27.5	212 44.6	288 32.4	-25 8.2	329 41.0	-21 28.9
12	3 22.1	-20 28.6	242 49.5	318 30.8	-25 7.7	359 42.1	-21 29.6
14	33 21.8	-20 29.6	272 54.4	348 29.2	-25 7.2	29 43.2	-21 30.3
16	63 21.4	-20 30.6	302 59.3	18 27.6	-25 6.6	59 44.3	-21 31.0
18	93 21.1	-20 31.6	333 4.3	48 26.0	-25 6.1	89 45.5	-21 31.7
20	123 20.7	-20 32.6	3 9.2	78 24.5	-25 5.6	119 46.6	-21 32.3
22	153 20.3	-20 33.6	33 14.1	108 22.9	-25 5.0	149 47.7	-21 33.0
Δ	-2	-5		-8	3	6	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	236 23.2	150 - 7	6.9	-139	129 59.7	-22 13.6	250 23.7	5 31.1
2	265 31.2	150 - 7	34.6	-138	160 3.6	-22 13.4	280 28.4	5 31.0
4	294 39.2	150 - 8	2.1	-137	190 7.5	-22 13.3	310 33.0	5 30.9
6	323 47.1	149 - 8	29.5	-136	220 11.4	-22 13.1	340 37.6	5 30.8
8	352 55.0	149 - 8	56.7	-135	250 15.3	-22 13.0	10 42.2	5 30.7
10	22 2.8	149 - 9	23.7	-134	280 19.2	-22 12.9	40 46.8	5 30.5
12	51 10.5	148 - 9	50.5	-133	310 23.1	-22 12.7	70 51.4	5 30.4
14	80 18.2	148 -10	17.1	-132	340 27.1	-22 12.6	100 56.0	5 30.3
16	109 25.8	147 -10	43.5	-131	10 31.0	-22 12.4	131 .7	5 30.2
18	138 33.2	147 -11	9.7	-130	40 34.9	-22 12.3	161 5.3	5 30.1
20	167 40.6	146 -11	35.7	-129	70 38.8	-22 12.2	191 9.9	5 30.0
22	196 47.9	146 -12	1.5	-128	100 42.7	-22 12.0	221 14.5	5 29.9
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 18	15 14	0 52	2 35	3 17	3.6	13 24	.1
55	7 48	15 45	0 42	2 11	3 6	3.3	13 38	.4
50	7 26	16 7	0 37	1 55	2 58	3.0	13 48	.7
45	7 9	16 24	0 32	1 44	2 52	2.8	13 56	.9
40	6 54	16 38	0 30	1 35	2 46	2.6	14 3	1.0
35	6 42	16 50	0 27	1 29	2 42	2.5	14 9	1.2
30	6 32	17 1	0 26	1 24	2 38	2.4	14 14	1.3
20	6 14	17 19	0 23	1 17	2 31	2.2	14 24	1.5
10	5 58	17 35	0 22	1 14	2 25	2.0	14 32	1.7
0	5 43	17 50	0 22	1 14	2 19	1.8	14 39	1.8
10	5 28	18 5	0 23	1 16	2 13	1.6	14 47	2.0
20	5 11	18 22	0 24	1 22	2 7	1.4	14 55	2.2
30	4 53	18 41	0 27	1 33	2 1	1.2	15 5	2.4
35	4 42	18 52	0 29	1 42	1 57	1.1	15 10	2.5
40	4 29	19 5	0 31	1 55	1 53	1.0	15 16	2.6
45	4 14	19 20	0 35	2 16	1 48	.8	15 24	2.8
50	3 55	19 39	0 41	3 3	1 42	.6	15 32	3.0
55	3 31	20 3	0 51	: ::	1 35	.4	15 43	3.3
60	2 57	20 38	1 12	: ::	1 26	.1	15 58	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 37.2	-.7	16.2	$T_{\overline{m}}$	8 29	1.8	55.8	15.2
12	13 28.6	$T_{\overline{m}_\odot}$	11 h 46.5 min	Starost 25.0 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 46	.1	76	-4.0	♃	15 18	.0	68	-1.9
♂	12 1	.1	117	1.4	♄	7 17	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 20.0	-20 34.6	63 19.1	138 21.3	-25 4.5	179 48.8	-21 33.7
2	213 19.6	-20 35.6	93 24.0	168 19.7	-25 4.0	209 49.9	-21 34.4
4	243 19.2	-20 36.6	123 28.9	198 18.1	-25 3.4	239 51.1	-21 35.1
6	273 18.9	-20 37.6	153 33.8	228 16.5	-25 2.9	269 52.2	-21 35.8
8	303 18.5	-20 38.6	183 38.8	258 14.9	-25 2.3	299 53.3	-21 36.5
10	333 18.1	-20 39.6	213 43.7	288 13.3	-25 1.7	329 54.4	-21 37.1
12	3 17.8	-20 40.6	243 48.6	318 11.8	-25 1.2	359 55.5	-21 37.8
14	33 17.4	-20 41.6	273 53.6	348 10.2	-25 .6	29 56.6	-21 38.5
16	63 17.0	-20 42.6	303 58.5	18 8.6	-25 .0	59 57.7	-21 39.2
18	93 16.6	-20 43.6	334 3.4	48 7.0	-24 59.4	89 58.9	-21 39.9
20	123 16.3	-20 44.6	4 8.3	78 5.5	-24 58.8	119 60.0	-21 40.5
22	153 15.9	-20 45.5	34 13.3	108 3.9	-24 58.2	150 1.1	-21 41.2
Δ	-2	-5		-8	3	6	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	225 55.1	145	-12 27.0	-126	130 46.6	-22 11.9	251 19.1	5 29.8
2	255 2.1	145	-12 52.3	-125	160 50.5	-22 11.7	281 23.8	5 29.7
4	284 9.1	144	-13 17.3	-124	190 54.4	-22 11.6	311 28.4	5 29.6
6	313 15.9	143	-13 42.1	-123	220 58.3	-22 11.4	341 33.0	5 29.4
8	342 22.5	143	-14 6.7	-121	251 2.2	-22 11.3	11 37.6	5 29.3
10	11 29.1	142	-14 30.9	-120	281 6.1	-22 11.2	41 42.2	5 29.2
12	40 35.4	141	-14 54.9	-119	311 10.0	-22 11.0	71 46.9	5 29.1
14	69 41.7	140	-15 18.7	-117	341 13.9	-22 10.9	101 51.5	5 29.0
16	98 47.7	140	-15 42.1	-116	11 17.8	-22 10.7	131 56.1	5 28.9
18	127 53.6	139	-16 5.3	-114	41 21.7	-22 10.6	162 .7	5 28.8
20	156 59.4	138	-16 28.1	-113	71 25.6	-22 10.4	192 5.3	5 28.7
22	186 5.0	137	-16 50.7	-111	101 29.5	-22 10.3	222 10.0	5 28.6
Δ					20	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 21	15 13	0 52	2 36	4 44	3.7	13 27	.2
55	7 50	15 43	0 43	2 12	4 25	3.3	13 48	.6
50	7 27	16 6	0 37	1 55	4 10	3.0	14 4	.8
45	7 10	16 23	0 33	1 44	3 59	2.8	14 17	1.0
40	6 56	16 38	0 30	1 35	3 49	2.6	14 28	1.2
35	6 43	16 50	0 27	1 29	3 41	2.5	14 37	1.3
30	6 33	17 1	0 26	1 24	3 34	2.4	14 45	1.4
20	6 14	17 19	0 24	1 17	3 22	2.2	14 59	1.6
10	5 58	17 35	0 22	1 14	3 12	2.0	15 12	1.7
0	5 43	17 50	0 22	1 14	3 2	1.9	15 23	1.9
10	5 28	18 6	0 23	1 16	2 52	1.7	15 35	2.0
20	5 11	18 22	0 24	1 22	2 42	1.5	15 47	2.2
30	4 52	18 42	0 27	1 33	2 31	1.3	16 2	2.4
35	4 41	18 53	0 29	1 42	2 24	1.2	16 10	2.5
40	4 28	19 6	0 31	1 55	2 17	1.1	16 20	2.6
45	4 13	19 21	0 35	2 17	2 8	.9	16 31	2.8
50	3 54	19 40	0 41	3 7	1 58	.7	16 44	3.0
55	3 29	20 5	0 51	: ::	1 45	.5	17 2	3.3
60	2 55	20 41	1 13	: ::	1 28	.1	17 25	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 20.1	-.7	16.2	$T_{\overline{m}}$	9 13	1.9	55.3	15.1
12	13 11.1	$T_{\overline{m}_\odot}$	11 h 46.8 min	Starost 26.0 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 47	.1	75	-4.0	♃	15 15	.0	67	-1.9
♂	12 0	.1	116	1.4	♄	7 14	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 15.5	-20 46.5	64 18.2	138 2.3	-24 57.6	180 2.2	-21 41.9
2	213 15.1	-20 47.5	94 23.1	168 .7	-24 57.0	210 3.3	-21 42.6
4	243 14.7	-20 48.5	124 28.0	197 59.2	-24 56.4	240 4.4	-21 43.2
6	273 14.3	-20 49.4	154 33.0	227 57.6	-24 55.8	270 5.5	-21 43.9
8	303 14.0	-20 50.4	184 37.9	257 56.0	-24 55.2	300 6.6	-21 44.6
10	333 13.6	-20 51.4	214 42.8	287 54.5	-24 54.6	330 7.7	-21 45.2
12	3 13.2	-20 52.3	244 47.8	317 52.9	-24 53.9	0 8.8	-21 45.9
14	33 12.8	-20 53.3	274 52.7	347 51.4	-24 53.3	30 9.9	-21 46.6
16	63 12.4	-20 54.2	304 57.6	17 49.8	-24 52.7	60 11.0	-21 47.2
18	93 12.0	-20 55.2	335 2.5	47 48.2	-24 52.0	90 12.1	-21 47.9
20	123 11.6	-20 56.1	5 7.5	77 46.7	-24 51.4	120 13.2	-21 48.5
22	153 11.2	-20 57.1	35 12.4	107 45.1	-24 50.7	150 14.3	-21 49.2
Δ	-2	-5		-8	3	6	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	215 10.4	136	-17 12.9	-110	131 33.4	-22 10.2	252 14.6	5 28.5
2	244 15.6	135	-17 34.8	-108	161 37.3	-22 10.0	282 19.2	5 28.4
4	273 20.6	134	-17 56.4	-106	191 41.2	-22 9.9	312 23.9	5 28.3
6	302 25.5	133	-18 17.7	-105	221 45.1	-22 9.7	342 28.5	5 28.2
8	331 30.1	132	-18 38.7	-103	251 49.0	-22 9.6	12 33.1	5 28.0
10	0 34.6	131	-18 59.3	-101	281 52.9	-22 9.4	42 37.7	5 27.9
12	29 38.9	130	-19 19.5	-99	311 56.8	-22 9.3	72 42.4	5 27.8
14	58 43.0	129	-19 39.4	-98	342 .7	-22 9.1	102 47.0	5 27.7
16	87 46.9	129	-19 58.9	-96	12 4.6	-22 9.0	132 51.6	5 27.6
18	116 50.6	128	-20 18.1	-94	42 8.4	-22 8.8	162 56.3	5 27.5
20	145 54.1	127	-20 36.9	-92	72 12.3	-22 8.7	193 .9	5 27.4
22	174 57.4	126	-20 55.3	-90	102 16.2	-22 8.6	223 5.5	5 27.3
Δ					19	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 23	15 11	0 52	2 36	6 12	3.7	13 31	.3
55	7 51	15 42	0 43	2 12	5 43	3.3	14 2	.8
50	7 29	16 5	0 37	1 56	5 22	3.0	14 24	1.0
45	7 11	16 23	0 33	1 44	5 6	2.8	14 41	1.2
40	6 57	16 37	0 30	1 35	4 53	2.6	14 56	1.4
35	6 44	16 50	0 27	1 29	4 41	2.5	15 8	1.5
30	6 34	17 0	0 26	1 24	4 31	2.4	15 19	1.6
20	6 15	17 19	0 24	1 17	4 15	2.2	15 37	1.7
10	5 59	17 35	0 22	1 14	4 0	2.1	15 54	1.9
0	5 43	17 51	0 22	1 14	3 47	1.9	16 9	2.0
10	5 28	18 6	0 23	1 16	3 33	1.8	16 24	2.1
20	5 11	18 23	0 24	1 22	3 19	1.6	16 40	2.2
30	4 52	18 42	0 27	1 33	3 3	1.5	16 59	2.4
35	4 41	18 54	0 29	1 42	2 53	1.4	17 10	2.5
40	4 28	19 7	0 32	1 56	2 43	1.2	17 23	2.6
45	4 12	19 23	0 36	2 18	2 30	1.1	17 38	2.7
50	3 53	19 42	0 41	3 10	2 15	.9	17 56	2.9
55	3 28	20 7	0 52	: ::	1 56	.6	18 20	3.2
60	2 53	20 43	1 14	: ::	1 31	.2	18 54	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	13 2.2	-.8	16.2	$T_{\overline{m}}$	9 58	2.0	54.9	15.0
12	12 52.8	$T_{\overline{m}_\odot}$	11 h 47.1 min	Starost 27.0 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 49	.1	74	-4.0	♃	15 12	.0	67	-1.9
♂	11 59	.1	116	1.4	♄	7 10	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 10.8	-20 58.0	65 17.3	137 43.6	-24 50.1	180 15.4	-21 49.8
2	213 10.4	-20 59.0	95 22.3	167 42.0	-24 49.4	210 16.5	-21 50.5
4	243 10.0	-20 59.9	125 27.2	197 40.5	-24 48.7	240 17.6	-21 51.2
6	273 9.6	-21 .8	155 32.1	227 38.9	-24 48.1	270 18.7	-21 51.8
8	303 9.2	-21 1.8	185 37.0	257 37.4	-24 47.4	300 19.8	-21 52.5
10	333 8.8	-21 2.7	215 42.0	287 35.9	-24 46.7	330 20.9	-21 53.1
12	3 8.4	-21 3.6	245 46.9	317 34.3	-24 46.0	0 22.0	-21 53.7
14	33 8.0	-21 4.5	275 51.8	347 32.8	-24 45.3	30 23.1	-21 54.4
16	63 7.6	-21 5.5	305 56.8	17 31.2	-24 44.6	60 24.1	-21 55.0
18	93 7.2	-21 6.4	336 1.7	47 29.7	-24 43.9	90 25.2	-21 55.7
20	123 6.8	-21 7.3	6 6.6	77 28.2	-24 43.2	120 26.3	-21 56.3
22	153 6.4	-21 8.2	36 11.5	107 26.6	-24 42.5	150 27.4	-21 57.0
Δ	-2	-5		-8	3	5	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	204 .5	125	-21 13.3	-88	132 20.1	-22 8.4	253 10.2	5 27.2
2	233 3.4	124	-21 30.9	-86	162 24.0	-22 8.3	283 14.8	5 27.1
4	262 6.1	123	-21 48.2	-84	192 27.9	-22 8.1	313 19.4	5 27.0
6	291 8.7	122	-22 5.0	-82	222 31.8	-22 8.0	343 24.1	5 26.9
8	320 11.0	121	-22 21.4	-80	252 35.7	-22 7.8	13 28.7	5 26.8
10	349 13.1	120	-22 37.4	-78	282 39.6	-22 7.7	43 33.3	5 26.7
12	18 15.0	119	-22 53.0	-76	312 43.5	-22 7.5	73 38.0	5 26.6
14	47 16.8	118	-23 8.2	-74	342 47.3	-22 7.4	103 42.6	5 26.5
16	76 18.3	117	-23 22.9	-71	12 51.2	-22 7.2	133 47.2	5 26.4
18	105 19.7	116	-23 37.2	-69	42 55.1	-22 7.1	163 51.9	5 26.3
20	134 20.8	115	-23 51.0	-67	72 59.0	-22 6.9	193 56.5	5 26.2
22	163 21.8	114	-24 4.4	-65	103 2.9	-22 6.8	224 1.1	5 26.1
Δ					19	1	23	-1

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 25	15 9	0 53	2 37	7 41	3.6	13 38	.6
55	7 53	15 41	0 43	2 12	7 1	3.1	14 20	1.1
50	7 30	16 4	0 37	1 56	6 33	2.9	14 49	1.3
45	7 12	16 22	0 33	1 44	6 12	2.7	15 11	1.5
40	6 58	16 37	0 30	1 36	5 55	2.6	15 28	1.6
35	6 45	16 49	0 28	1 29	5 41	2.5	15 43	1.7
30	6 34	17 0	0 26	1 24	5 29	2.4	15 56	1.8
20	6 16	17 19	0 24	1 17	5 8	2.2	16 19	1.9
10	5 59	17 36	0 22	1 14	4 50	2.1	16 38	2.0
0	5 44	17 51	0 22	1 14	4 33	2.0	16 56	2.1
10	5 28	18 7	0 23	1 16	4 16	1.9	17 14	2.1
20	5 11	18 24	0 24	1 22	3 59	1.8	17 34	2.2
30	4 52	18 43	0 27	1 33	3 38	1.7	17 57	2.4
35	4 40	18 55	0 29	1 43	3 26	1.6	18 10	2.4
40	4 27	19 8	0 32	1 56	3 13	1.5	18 25	2.5
45	4 12	19 24	0 36	2 19	2 57	1.3	18 44	2.6
50	3 52	19 43	0 42	3 14	2 37	1.2	19 7	2.7
55	3 27	20 9	0 52	: ::	2 12	.9	19 37	3.0
60	2 51	20 45	1 16	: ::	1 37	.4	20 22	3.4
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	12 43.5	-.8	16.2	$T_{\overline{m}}$ 10 45	2.0	54.5	14.9
12	12 33.8	$T_{\overline{m}_\odot}$ 11 h 47.4 min		Starost 28.0 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 50	.1	72	-4.0	♃	15 9	.0	67	-1.9
♂	11 59	.1	115	1.4	♄	7 6	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	183 6.0	-21 9.1	66 16.5	137 25.1	-24 41.8	180 28.5	-21 57.6
2	213 5.6	-21 10.0	96 21.4	167 23.6	-24 41.1	210 29.6	-21 58.2
4	243 5.1	-21 10.9	126 26.3	197 22.1	-24 40.4	240 30.7	-21 58.9
6	273 4.7	-21 11.8	156 31.3	227 20.5	-24 39.6	270 31.7	-21 59.5
8	303 4.3	-21 12.7	186 36.2	257 19.0	-24 38.9	300 32.8	-22 .1
10	333 3.9	-21 13.6	216 41.1	287 17.5	-24 38.2	330 33.9	-22 .8
12	3 3.5	-21 14.5	246 46.0	317 16.0	-24 37.4	0 35.0	-22 1.4
14	33 3.1	-21 15.4	276 51.0	347 14.5	-24 36.7	30 36.1	-22 2.0
16	63 2.6	-21 16.3	306 55.9	17 12.9	-24 35.9	60 37.1	-22 2.7
18	93 2.2	-21 17.2	337 .8	47 11.4	-24 35.2	90 38.2	-22 3.3
20	123 1.8	-21 18.1	7 5.8	77 9.9	-24 34.4	120 39.3	-22 3.9
22	153 1.4	-21 18.9	37 10.7	107 8.4	-24 33.6	150 40.4	-22 4.5
Δ	-2	-4		-8	4	5	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	192 22.6	113	-24 17.3	-62	133 6.8	-22 6.6	254 5.8	5 26.0
2	221 23.3	112	-24 29.8	-60	163 10.6	-22 6.5	284 10.4	5 25.9
4	250 23.8	112	-24 41.8	-58	193 14.5	-22 6.3	314 15.1	5 25.8
6	279 24.1	111	-24 53.3	-55	223 18.4	-22 6.2	344 19.7	5 25.7
8	308 24.2	110	-25 4.4	-53	253 22.3	-22 6.0	14 24.4	5 25.6
10	337 24.2	109	-25 15.0	-51	283 26.2	-22 5.9	44 29.0	5 25.5
12	6 24.1	109	-25 25.1	-48	313 30.0	-22 5.7	74 33.6	5 25.4
14	35 23.8	108	-25 34.7	-46	343 33.9	-22 5.6	104 38.3	5 25.3
16	64 23.4	107	-25 43.8	-43	13 37.8	-22 5.4	134 42.9	5 25.2
18	93 22.8	107	-25 52.5	-41	43 41.7	-22 5.3	164 47.6	5 25.1
20	122 22.2	106	-26 .6	-38	73 45.6	-22 5.1	194 52.2	5 25.0
22	151 21.4	106	-26 8.2	-36	103 49.4	-22 5.0	224 56.9	5 24.9
Δ					19	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 27	15 8	0 53	2 37	9 8	3.2	13 53	1.2
55	7 55	15 40	0 43	2 13	8 16	2.8	14 46	1.6
50	7 32	16 3	0 37	1 56	7 42	2.6	15 20	1.7
45	7 14	16 22	0 33	1 44	7 17	2.5	15 46	1.8
40	6 59	16 36	0 30	1 36	6 57	2.4	16 7	1.9
35	6 46	16 49	0 28	1 29	6 40	2.4	16 24	1.9
30	6 35	17 0	0 26	1 24	6 26	2.3	16 38	2.0
20	6 16	17 19	0 24	1 18	6 2	2.2	17 4	2.0
10	5 60	17 36	0 22	1 14	5 41	2.2	17 25	2.1
0	5 44	17 51	0 22	1 14	5 22	2.1	17 46	2.1
10	5 28	18 7	0 23	1 16	5 2	2.0	18 6	2.2
20	5 11	18 24	0 24	1 22	4 42	1.9	18 28	2.2
30	4 52	18 44	0 27	1 34	4 18	1.9	18 53	2.2
35	4 40	18 56	0 29	1 43	4 4	1.8	19 8	2.3
40	4 27	19 9	0 32	1 57	3 48	1.7	19 25	2.3
45	4 11	19 25	0 36	2 20	3 29	1.6	19 46	2.4
50	3 51	19 45	0 42	3 19	3 5	1.5	20 12	2.4
55	3 26	20 11	0 52	: ::	2 34	1.3	20 48	2.5
60	2 49	20 48	1 17	: ::	1 48	.8	21 45	2.8
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	12 24.1	-.8	16.2	$T_{\overline{m}}$ 11 34	2.1	54.3	14.8
12	12 14.0	$T_{\overline{m}_\odot}$ 11 h 47.8 min		Starost 29.0 d		Faza ●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 51	.1	71	-4.0	♃	15 6	.0	67	-1.9
♂	11 58	.1	114	1.4	♄	7 3	.0	188	1.0

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	183	.9	-21	19.8	67	15.6	137	6.9	-24	32.8	180	41.4	-22	5.2
2	213	.5	-21	20.7	97	20.5	167	5.4	-24	32.1	210	42.5	-22	5.8
4	243	.1	-21	21.6	127	25.5	197	3.9	-24	31.3	240	43.6	-22	6.4
6	272	59.6	-21	22.4	157	30.4	227	2.4	-24	30.5	270	44.6	-22	7.0
8	302	59.2	-21	23.3	187	35.3	257	.9	-24	29.7	300	45.7	-22	7.6
10	332	58.8	-21	24.2	217	40.3	286	59.4	-24	28.9	330	46.8	-22	8.2
12	2	58.3	-21	25.0	247	45.2	316	57.9	-24	28.1	0	47.9	-22	8.9
14	32	57.9	-21	25.9	277	50.1	346	56.4	-24	27.3	30	48.9	-22	9.5
16	62	57.5	-21	26.7	307	55.0	16	54.9	-24	26.5	60	50.0	-22	10.1
18	92	57.0	-21	27.6	338	.0	46	53.4	-24	25.7	90	51.0	-22	10.7
20	122	56.6	-21	28.4	8	4.9	76	52.0	-24	24.9	120	52.1	-22	11.3
22	152	56.2	-21	29.3	38	9.8	106	50.5	-24	24.0	150	53.2	-22	11.9
Δ		-2		-4				-7		4		5		-3

UT	MESEC					JUPITER			SATURN		
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	180	20.5	105	-26	15.4	-33	133	53.3	-22	4.8	255	1.5	5	24.8
2	209	19.5	105	-26	22.0	-31	163	57.2	-22	4.7	285	6.2	5	24.7
4	238	18.4	104	-26	28.1	-28	194	1.1	-22	4.5	315	10.8	5	24.6
6	267	17.3	104	-26	33.7	-26	224	4.9	-22	4.4	345	15.5	5	24.5
8	296	16.1	104	-26	38.8	-23	254	8.8	-22	4.2	15	20.1	5	24.4
10	325	14.8	103	-26	43.4	-20	284	12.7	-22	4.1	45	24.8	5	24.3
12	354	13.4	103	-26	47.5	-18	314	16.5	-22	3.9	75	29.4	5	24.2
14	23	12.0	103	-26	51.0	-15	344	20.4	-22	3.8	105	34.1	5	24.1
16	52	10.6	103	-26	54.1	-13	14	24.3	-22	3.6	135	38.7	5	24.0
18	81	9.1	103	-26	56.6	-10	44	28.2	-22	3.5	165	43.4	5	23.9
20	110	7.6	102	-26	58.6	-7	74	32.0	-22	3.3	195	48.0	5	23.8
22	139	6.1	102	-27	.0	-5	104	35.9	-22	3.1	225	52.7	5	23.7
Δ								19		1		23		0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 29	15 6	0 53	2 38	10 25	2.3	14 21	2.1
55	7 57	15 39	0 43	2 13	9 22	2.2	15 23	2.1
50	7 33	16 3	0 37	1 56	8 44	2.2	16 2	2.2
45	7 15	16 21	0 33	1 45	8 17	2.2	16 30	2.2
40	6 60	16 36	0 30	1 36	7 55	2.2	16 52	2.1
35	6 47	16 49	0 28	1 29	7 37	2.2	17 10	2.1
30	6 36	16 60	0 26	1 24	7 21	2.2	17 26	2.1
20	6 17	17 19	0 24	1 18	6 55	2.2	17 52	2.1
10	6 0	17 36	0 23	1 14	6 33	2.1	18 15	2.1
0	5 44	17 52	0 22	1 14	6 12	2.1	18 36	2.1
10	5 29	18 8	0 23	1 16	5 51	2.1	18 58	2.1
20	5 11	18 25	0 24	1 22	5 28	2.1	19 20	2.1
30	4 52	18 45	0 27	1 34	5 2	2.1	19 47	2.1
35	4 40	18 57	0 29	1 43	4 47	2.0	20 3	2.1
40	4 26	19 10	0 32	1 57	4 29	2.0	20 21	2.1
45	4 10	19 26	0 36	2 21	4 8	2.0	20 43	2.0
50	3 51	19 46	0 42	3 24	3 41	1.9	21 11	2.0
55	3 25	20 13	0 53	: ::	3 5	1.9	21 49	1.9
60	2 48	20 50	1 18	: ::	2 8	1.6	22 52	1.8
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	12 3.9	-.9	16.2	$T_{\overline{m}}$	12 24	2.1	54.1	14.7
12	11 53.5	$T_{\overline{m}_\odot}$	11 h 48.1 min	Starost	.3 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 52	.1	70	-4.0	♄	15 3	.0	67	-1.9
♂	11 57	.1	113	1.4	♃	6 59	.0	188	1.0

UT	SUNCE				PROLEĆ. TAČKA		VENERA				MARS			
	$S_\odot$		$\delta_\odot$		S_Υ		S_φ		δ_φ		S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	182	55.7	-21	30.1	68	14.7	136	49.0	-24	23.2	180	54.2	-22	12.5
2	212	55.3	-21	31.0	98	19.7	166	47.5	-24	22.4	210	55.3	-22	13.1
4	242	54.8	-21	31.8	128	24.6	196	46.0	-24	21.5	240	56.4	-22	13.7
6	272	54.4	-21	32.6	158	29.5	226	44.6	-24	20.7	270	57.4	-22	14.3
8	302	53.9	-21	33.5	188	34.5	256	43.1	-24	19.8	300	58.5	-22	14.9
10	332	53.5	-21	34.3	218	39.4	286	41.6	-24	19.0	330	59.5	-22	15.5
12	2	53.0	-21	35.1	248	44.3	316	40.1	-24	18.1	1	.6	-22	16.1
14	32	52.6	-21	35.9	278	49.2	346	38.7	-24	17.3	31	1.6	-22	16.7
16	62	52.1	-21	36.8	308	54.2	16	37.2	-24	16.4	61	2.7	-22	17.3
18	92	51.7	-21	37.6	338	59.1	46	35.8	-24	15.5	91	3.8	-22	17.9
20	122	51.2	-21	38.4	9	4.0	76	34.3	-24	14.6	121	4.8	-22	18.5
22	152	50.8	-21	39.2	39	9.0	106	32.8	-24	13.8	151	5.9	-22	19.1
Δ		-2		-4				-7		4		5		-3

UT	MESEC					JUPITER			SATURN		
	$S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	$S_{\text{♃}}$		$\delta_{\text{♃}}$		$S_{\text{♄}}$		$\delta_{\text{♄}}$	
h	°	′		°	′		°	′	°	′	°	′	°	′
0	168	4.6	102	-27	1.0	-2	134	39.8	-22	3.0	255	57.3	5	23.6
2	197	3.1	103	-27	1.4	0	164	43.6	-22	2.8	286	2.0	5	23.5
4	226	1.6	103	-27	1.3	3	194	47.5	-22	2.7	316	6.6	5	23.5
6	255	.1	103	-27	.7	6	224	51.4	-22	2.5	346	11.3	5	23.4
8	283	58.7	103	-26	59.5	8	254	55.2	-22	2.4	16	15.9	5	23.3
10	312	57.3	103	-26	57.9	11	284	59.1	-22	2.2	46	20.6	5	23.2
12	341	56.0	104	-26	55.7	13	315	3.0	-22	2.1	76	25.3	5	23.1
14	10	54.7	104	-26	53.0	16	345	6.8	-22	1.9	106	29.9	5	23.0
16	39	53.5	104	-26	49.8	19	15	10.7	-22	1.8	136	34.6	5	22.9
18	68	52.3	105	-26	46.1	21	45	14.6	-22	1.6	166	39.2	5	22.8
20	97	51.3	105	-26	41.9	24	75	18.4	-22	1.4	196	43.9	5	22.7
22	126	50.3	106	-26	37.1	26	105	22.3	-22	1.3	226	48.6	5	22.6
Δ								19		1		23		0

	SUNCE		TRAJANJE SUMRAKA		MESEC			
φ	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 32	15 5	0 54	2 39	11 19	1.3	15 12	3.1
55	7 58	15 38	0 43	2 13	10 16	1.6	16 15	2.7
50	7 34	16 2	0 37	1 57	9 38	1.8	16 53	2.5
45	7 16	16 21	0 33	1 45	9 10	1.9	17 21	2.4
40	7 1	16 36	0 30	1 36	8 47	1.9	17 43	2.4
35	6 48	16 49	0 28	1 29	8 29	1.9	18 1	2.3
30	6 37	16 60	0 26	1 24	8 13	2.0	18 17	2.3
20	6 18	17 19	0 24	1 18	7 47	2.0	18 43	2.2
10	6 1	17 36	0 23	1 14	7 24	2.1	19 6	2.1
0	5 45	17 52	0 22	1 14	7 3	2.1	19 27	2.1
10	5 29	18 8	0 23	1 17	6 41	2.1	19 48	2.0
20	5 11	18 26	0 24	1 22	6 18	2.2	20 11	2.0
30	4 51	18 46	0 27	1 34	5 52	2.2	20 37	1.9
35	4 40	18 58	0 29	1 44	5 36	2.2	20 52	1.8
40	4 26	19 11	0 32	1 58	5 18	2.3	21 10	1.8
45	4 10	19 28	0 36	2 22	4 56	2.3	21 31	1.7
50	3 50	19 48	0 42	3 29	4 28	2.4	21 59	1.6
55	3 24	20 14	0 53	: ::	3 50	2.4	22 35	1.4
60	2 46	20 52	1 20	: ::	2 47	2.6	23 34	.9
S								

SUNCE				MESEC				
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 43.0	-.9	16.2	$T_{\overline{m}}$	13 15	2.1	54.0	14.7
12	11 32.3	$T_{\overline{m}_\odot}$	11 h 48.5 min	Starost	1.3 d	Faza	●	

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	14 53	.1	69	-4.0	♄	14 59	.0	66	-1.9
♂	11 56	.1	113	1.4	♃	6 55	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 50.3	-21 40.0	69 13.9	136 31.4	-24 12.9	181 6.9	-22 19.6
2	212 49.9	-21 40.8	99 18.8	166 29.9	-24 12.0	211 8.0	-22 20.2
4	242 49.4	-21 41.6	129 23.7	196 28.5	-24 11.1	241 9.0	-22 20.8
6	272 49.0	-21 42.4	159 28.7	226 27.0	-24 10.2	271 10.1	-22 21.4
8	302 48.5	-21 43.2	189 33.6	256 25.6	-24 9.3	301 11.1	-22 22.0
10	332 48.0	-21 44.0	219 38.5	286 24.1	-24 8.4	331 12.2	-22 22.6
12	2 47.6	-21 44.8	249 43.5	316 22.7	-24 7.5	1 13.2	-22 23.1
14	32 47.1	-21 45.6	279 48.4	346 21.2	-24 6.5	31 14.2	-22 23.7
16	62 46.6	-21 46.4	309 53.3	16 19.8	-24 5.6	61 15.3	-22 24.3
18	92 46.2	-21 47.2	339 58.2	46 18.4	-24 4.7	91 16.3	-22 24.9
20	122 45.7	-21 47.9	10 3.2	76 16.9	-24 3.8	121 17.4	-22 25.4
22	152 45.2	-21 48.7	40 8.1	106 15.5	-24 2.8	151 18.4	-22 26.0
Δ	-2	-4		-7	5	5	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	155 49.5	106	-26 31.9	29	135 26.2	-22 1.1	256 53.2	5 22.5
2	184 48.7	107	-26 26.1	31	165 30.0	-22 1.0	286 57.9	5 22.4
4	213 48.1	107	-26 19.9	34	195 33.9	-22 .8	317 2.5	5 22.3
6	242 47.6	108	-26 13.1	36	225 37.7	-22 .7	347 7.2	5 22.3
8	271 47.2	109	-26 5.9	39	255 41.6	-22 .5	17 11.9	5 22.2
10	300 46.9	109	-25 58.2	41	285 45.5	-22 .4	47 16.5	5 22.1
12	329 46.8	110	-25 49.9	43	315 49.3	-22 .2	77 21.2	5 22.0
14	358 46.9	111	-25 41.2	46	345 53.2	-22 .0	107 25.9	5 21.9
16	27 47.1	112	-25 32.1	48	15 57.0	-21 59.9	137 30.5	5 21.8
18	56 47.5	113	-25 22.4	51	46 .9	-21 59.7	167 35.2	5 21.7
20	85 48.0	113	-25 12.3	53	76 4.7	-21 59.6	197 39.9	5 21.6
22	114 48.7	114	-25 1.7	55	106 8.6	-21 59.4	227 44.5	5 21.5
Δ					19	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 34	15 4	0 54	2 39	11 50	.7	16 25	3.5
55	7 60	15 37	0 44	2 14	10 55	1.1	17 19	3.0
50	7 36	16 1	0 37	1 57	10 20	1.4	17 54	2.8
45	7 17	16 20	0 33	1 45	9 54	1.5	18 20	2.6
40	7 2	16 36	0 30	1 36	9 33	1.6	18 40	2.5
35	6 49	16 48	0 28	1 29	9 16	1.7	18 57	2.4
30	6 38	16 60	0 26	1 24	9 1	1.8	19 11	2.3
20	6 18	17 19	0 24	1 18	8 35	1.9	19 36	2.2
10	6 1	17 36	0 23	1 15	8 14	2.0	19 57	2.1
0	5 45	17 53	0 22	1 14	7 53	2.0	20 17	2.0
10	5 29	18 9	0 23	1 17	7 32	2.1	20 37	1.9
20	5 12	18 26	0 24	1 23	7 10	2.2	20 58	1.8
30	4 51	18 47	0 27	1 34	6 45	2.3	21 22	1.7
35	4 39	18 59	0 29	1 44	6 30	2.4	21 36	1.6
40	4 26	19 12	0 32	1 58	6 12	2.5	21 52	1.5
45	4 9	19 29	0 36	2 22	5 51	2.5	22 12	1.4
50	3 49	19 49	0 42	3 37	5 24	2.7	22 36	1.2
55	3 23	20 16	0 54	: ::	4 48	2.9	23 8	.9
60	2 44	20 55	1 21	: ::	3 50	3.3	23 56	.5
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	11 21.5	-.9	16.2	$T_{\overline{m}}$	14 5	2.0	53.9	14.7
12	11 10.4	$T_{\overline{m}_\odot}$	11 h 48.8 min	Starost	2.3 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 55	.1	67	-4.0	♃	14 56	.0	66	-1.8
♂	11 55	.1	112	1.4	♄	6 51	.0	188	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 44.8	-21 49.5	70 13.0	136 14.1	-24 1.9	181 19.5	-22 26.6
2	212 44.3	-21 50.3	100 18.0	166 12.6	-24 .9	211 20.5	-22 27.1
4	242 43.8	-21 51.0	130 22.9	196 11.2	-23 60.0	241 21.5	-22 27.7
6	272 43.4	-21 51.8	160 27.8	226 9.8	-23 59.0	271 22.6	-22 28.3
8	302 42.9	-21 52.6	190 32.7	256 8.4	-23 58.1	301 23.6	-22 28.8
10	332 42.4	-21 53.3	220 37.7	286 7.0	-23 57.1	331 24.6	-22 29.4
12	2 41.9	-21 54.1	250 42.6	316 5.5	-23 56.1	1 25.7	-22 30.0
14	32 41.5	-21 54.8	280 47.5	346 4.1	-23 55.2	31 26.7	-22 30.5
16	62 41.0	-21 55.6	310 52.5	16 2.7	-23 54.2	61 27.7	-22 31.1
18	92 40.5	-21 56.3	340 57.4	46 1.3	-23 53.2	91 28.8	-22 31.6
20	122 40.0	-21 57.1	11 2.3	75 59.9	-23 52.2	121 29.8	-22 32.2
22	152 39.6	-21 57.8	41 7.2	105 58.5	-23 51.2	151 30.8	-22 32.7
Δ	-2	-4		-7	5	5	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	143 49.6	115	-24 50.6	58	136 12.5	-21 59.2	257 49.2	5 21.5
2	172 50.6	116	-24 39.1	60	166 16.3	-21 59.1	287 53.9	5 21.4
4	201 51.8	117	-24 27.1	62	196 20.2	-21 58.9	317 58.5	5 21.3
6	230 53.3	118	-24 14.7	64	226 24.0	-21 58.8	348 3.2	5 21.2
8	259 54.9	119	-24 1.9	66	256 27.9	-21 58.6	18 7.9	5 21.1
10	288 56.7	120	-23 48.5	69	286 31.7	-21 58.4	48 12.6	5 21.0
12	317 58.7	121	-23 34.8	71	316 35.6	-21 58.3	78 17.2	5 20.9
14	347 .8	122	-23 20.7	73	346 39.4	-21 58.1	108 21.9	5 20.8
16	16 3.2	123	-23 6.1	75	16 43.3	-21 58.0	138 26.6	5 20.8
18	45 5.8	124	-22 51.1	77	46 47.1	-21 57.8	168 31.2	5 20.7
20	74 8.6	125	-22 35.6	79	76 51.0	-21 57.6	198 35.9	5 20.6
22	103 11.6	126	-22 19.8	81	106 54.8	-21 57.5	228 40.6	5 20.5
Δ					19	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 36	15 2	0 54	2 40	12 6	.3	17 50	3.7
55	8 2	15 36	0 44	2 14	11 23	.8	18 32	3.2
50	7 37	16 1	0 37	1 57	10 53	1.1	19 1	2.9
45	7 18	16 20	0 33	1 45	10 30	1.2	19 23	2.7
40	7 3	16 35	0 30	1 36	10 12	1.4	19 40	2.6
35	6 50	16 48	0 28	1 30	9 57	1.5	19 55	2.5
30	6 38	16 60	0 26	1 25	9 43	1.6	20 8	2.4
20	6 19	17 19	0 24	1 18	9 20	1.7	20 29	2.2
10	6 2	17 37	0 23	1 15	9 1	1.8	20 48	2.1
0	5 46	17 53	0 22	1 14	8 42	2.0	21 5	1.9
10	5 29	18 9	0 23	1 17	8 23	2.1	21 22	1.8
20	5 12	18 27	0 24	1 23	8 4	2.2	21 41	1.6
30	4 51	18 47	0 27	1 34	7 40	2.4	22 2	1.5
35	4 39	18 59	0 29	1 44	7 27	2.4	22 14	1.4
40	4 25	19 13	0 32	1 59	7 11	2.6	22 28	1.3
45	4 9	19 30	0 36	2 23	6 52	2.7	22 44	1.1
50	3 48	19 51	0 43	3 50	6 29	2.9	23 5	.9
55	3 22	20 18	0 54	: ::	5 57	3.1	23 31	.7
60	2 43	20 57	1 23	: ::	5 10	3.6	.. ..	.0
S								

SUNCE				MESEC			
UT	$e=T_p-UT$	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	10 59.3	-1.0	16.2	$T_{\overline{m}}$	14 54	1.9	54.0	14.7
12	10 47.9	$T_{\overline{m}_\odot}$	11 h 49.2 min	Starost	3.3 d	Faza	●	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 56	.1	66	-4.0	♃	14 53	.0	66	-1.8
♂	11 54	.1	111	1.3	♄	6 48	.0	188	1.0

2. DECEMBAR 2008. UTORAK

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA $S_♀$	$\delta_♀$	MARS $S_♂$	$\delta_♂$
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 39.1	-21 58.6	71 12.2	135 57.1	-23 50.2	181 31.9	-22 33.3
2	212 38.6	-21 59.3	101 17.1	165 55.7	-23 49.2	211 32.9	-22 33.8
4	242 38.1	-22 .0	131 22.0	195 54.3	-23 48.2	241 33.9	-22 34.4
6	272 37.6	-22 .8	161 26.9	225 52.9	-23 47.2	271 34.9	-22 34.9
8	302 37.1	-22 1.5	191 31.9	255 51.5	-23 46.2	301 36.0	-22 35.5
10	332 36.6	-22 2.2	221 36.8	285 50.1	-23 45.2	331 37.0	-22 36.0
12	2 36.2	-22 2.9	251 41.7	315 48.7	-23 44.2	1 38.0	-22 36.6
14	32 35.7	-22 3.6	281 46.7	345 47.4	-23 43.1	31 39.0	-22 37.1
16	62 35.2	-22 4.4	311 51.6	15 46.0	-23 42.1	61 40.1	-22 37.6
18	92 34.7	-22 5.1	341 56.5	45 44.6	-23 41.1	91 41.1	-22 38.2
20	122 34.2	-22 5.8	12 1.4	75 43.2	-23 40.0	121 42.1	-22 38.7
22	152 33.7	-22 6.5	42 6.4	105 41.8	-23 39.0	151 43.1	-22 39.3
Δ	-2	-4		-7	5	5	-3

UT	MESEC $S_☾$	Δ	$\delta_☾$	Δ	JUPITER $S_♃$	$\delta_♃$	SATURN $S_♄$	$\delta_♄$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	132 14.8	127	-22 3.6	83	136 58.7	-21 57.3	258 45.3	5 20.4
2	161 18.2	128	-21 47.0	85	167 2.5	-21 57.2	288 50.0	5 20.3
4	190 21.7	129	-21 30.0	87	197 6.4	-21 57.0	318 54.6	5 20.3
6	219 25.5	130	-21 12.6	89	227 10.2	-21 56.8	348 59.3	5 20.2
8	248 29.5	131	-20 54.8	91	257 14.1	-21 56.7	19 4.0	5 20.1
10	277 33.7	132	-20 36.6	93	287 17.9	-21 56.5	49 8.7	5 20.0
12	306 38.1	133	-20 18.1	94	317 21.8	-21 56.4	79 13.3	5 19.9
14	335 42.6	134	-19 59.2	96	347 25.6	-21 56.2	109 18.0	5 19.8
16	4 47.4	135	-19 40.0	98	17 29.5	-21 56.0	139 22.7	5 19.8
18	33 52.3	136	-19 20.4	100	47 33.3	-21 55.9	169 27.4	5 19.7
20	62 57.5	137	-19 .5	101	77 37.1	-21 55.7	199 32.1	5 19.6
22	92 2.8	137	-18 40.2	103	107 41.0	-21 55.5	229 36.8	5 19.5
Δ					19	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 38	15 1	0 55	2 40	12 14	.2	19 18	3.6
55	8 3	15 36	0 44	2 14	11 42	.6	19 49	3.2
50	7 38	16 0	0 38	1 57	11 18	.8	20 11	3.0
45	7 19	16 19	0 33	1 45	10 60	1.0	20 28	2.8
40	7 4	16 35	0 30	1 36	10 45	1.2	20 42	2.6
35	6 51	16 48	0 28	1 30	10 32	1.3	20 54	2.5
30	6 39	16 60	0 26	1 25	10 21	1.4	21 4	2.3
20	6 19	17 20	0 24	1 18	10 2	1.6	21 22	2.2
10	6 2	17 37	0 23	1 15	9 45	1.7	21 37	2.0
0	5 46	17 53	0 22	1 14	9 29	1.9	21 51	1.8
10	5 29	18 10	0 23	1 17	9 13	2.0	22 5	1.7
20	5 12	18 28	0 24	1 23	8 56	2.2	22 20	1.5
30	4 51	18 48	0 27	1 35	8 37	2.4	22 37	1.3
35	4 39	19 0	0 29	1 44	8 25	2.5	22 47	1.2
40	4 25	19 14	0 32	1 59	8 12	2.6	22 58	1.1
45	4 9	19 31	0 36	2 24	7 57	2.7	23 11	.9
50	3 48	19 52	0 43	: ::	7 37	2.9	23 27	.8
55	3 21	20 19	0 54	: ::	7 12	3.2	23 47	.5
60	2 42	20 59	1 24	: ::	6 37	3.6	0 9	.3
S								

UT	SUNCE $e=T_p-UT$	Δ/24	r	MESEC Prolaz	Δ/24	$\pi_☾$	r
h	min s	s	′	h min	min	′	′
00	10 36.5	-1.0	16.2	T_m 15 40	1.9	54.2	14.8
12	10 24.7	$T_{m\odot}$ 11 h 49.6 min		Starost 4.3 d		Faza ◐	

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 57	.1	65	-4.0	♃	14 50	.0	66	-1.8
♂	11 53	.1	110	1.3	♄	6 44	.0	188	1.0

3. DECEMBAR SREDA

UT	SUNCE $S_\odot$	$\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA $S_♀$	$\delta_♀$	MARS $S_♂$	$\delta_♂$
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 33.2	-22 7.2	72 11.3	135 40.5	-23 37.9	181 44.1	-22 39.8
2	212 32.7	-22 7.9	102 16.2	165 39.1	-23 36.9	211 45.2	-22 40.3
4	242 32.2	-22 8.6	132 21.2	195 37.7	-23 35.8	241 46.2	-22 40.9
6	272 31.7	-22 9.3	162 26.1	225 36.4	-23 34.8	271 47.2	-22 41.4
8	302 31.2	-22 10.0	192 31.0	255 35.0	-23 33.7	301 48.2	-22 41.9
10	332 30.7	-22 10.7	222 35.9	285 33.6	-23 32.6	331 49.2	-22 42.4
12	2 30.2	-22 11.4	252 40.9	315 32.3	-23 31.5	1 50.2	-22 43.0
14	32 29.7	-22 12.0	282 45.8	345 30.9	-23 30.5	31 51.2	-22 43.5
16	62 29.2	-22 12.7	312 50.7	15 29.6	-23 29.4	61 52.3	-22 44.0
18	92 28.7	-22 13.4	342 55.7	45 28.2	-23 28.3	91 53.3	-22 44.5
20	122 28.2	-22 14.1	13 .6	75 26.9	-23 27.2	121 54.3	-22 45.0
22	152 27.7	-22 14.7	43 5.5	105 25.5	-23 26.1	151 55.3	-22 45.6
Δ	-3	-3		-7	5	5	-3

UT	MESEC $S_☾$	Δ	$\delta_☾$	Δ	JUPITER $S_♃$	$\delta_♃$	SATURN $S_♄$	$\delta_♄$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	121 8.3	138	-18 19.6	105	137 44.8	-21 55.4	259 41.4	5 19.4
2	150 13.9	139	-17 58.6	106	167 48.7	-21 55.2	289 46.1	5 19.3
4	179 19.8	140	-17 37.4	108	197 52.5	-21 55.1	319 50.8	5 19.3
6	208 25.8	141	-17 15.8	109	227 56.4	-21 54.9	349 55.5	5 19.2
8	237 31.9	142	-16 53.9	111	258 .2	-21 54.7	20 .2	5 19.1
10	266 38.3	142	-16 31.7	112	288 4.0	-21 54.6	50 4.9	5 19.0
12	295 44.7	143	-16 9.2	114	318 7.9	-21 54.4	80 9.6	5 18.9
14	324 51.4	144	-15 46.4	115	348 11.7	-21 54.2	110 14.2	5 18.9
16	353 58.1	145	-15 23.3	117	18 15.5	-21 54.1	140 18.9	5 18.8
18	23 5.0	145	-15 .0	118	48 19.4	-21 53.9	170 23.6	5 18.7
20	52 12.1	146	-14 36.3	120	78 23.2	-21 53.7	200 28.3	5 18.6
22	81 19.2	146	-14 12.4	121	108 27.1	-21 53.6	230 33.0	5 18.6
Δ					19	1	23	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 40	15 0	0 55	2 41	12 18	.1	20 45	3.6
55	8 5	15 35	0 44	2 15	11 55	.4	21 6	3.2
50	7 40	15 60	0 38	1 58	11 38	.7	21 22	3.0
45	7 21	16 19	0 33	1 45	11 24	.9	21 34	2.8
40	7 5	16 35	0 30	1 37	11 13	1.0	21 44	2.6
35	6 52	16 48	0 28	1 30	11 3	1.2	21 53	2.5
30	6 40	16 60	0 26	1 25	10 55	1.3	22 1	2.3
20	6 20	17 20	0 24	1 18	10 40	1.5	22 14	2.1
10	6 3	17 37	0 23	1 15	10 27	1.7	22 25	2.0
0	5 46	17 54	0 22	1 14	10 14	1.8	22 35	1.8
10	5 30	18 10	0 23	1 17	10 2	2.0	22 46	1.6
20	5 12	18 28	0 24	1 23	9 49	2.1	22 57	1.4
30	4 51	18 49	0 27	1 35	9 33	2.3	23 9	1.2
35	4 39	19 1	0 29	1 45	9 25	2.5	23 16	1.1
40	4 25	19 15	0 32	1 59	9 14	2.6	23 25	1.0
45	4 8	19 32	0 36	2 25	9 2	2.8	23 34	.8
50	3 47	19 53	0 43	: ::	8 48	3.0	23 45	.6
55	3 20	20 21	0 55	: ::	8 29	3.2	23 59	.4
60	2 40	21 1	1 26	: ::	8 4	3.6	0 15	.1
S								

UT	SUNCE $e=T_p-UT$	Δ/24	r	MESEC Prolaz	Δ/24	$\pi_☾$	r
h	min s	s	′	h min	min	′	′
00	10 13.0	-1.0	16.3	T_m 16 25	1.8	54.6	14.9
12	10 1.0	$T_{m\odot}$ 11 h 50.0 min		Starost 5.3 d		Faza ◐	

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 58	.1	63	-4.0	♃	14 47	.0	66	-1.8
♂	11 53	.1	110	1.3	♄	6 40	.0	187	1.0

4. DECEMBAR 2008. ČETVRTAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 27.2	-22 15.4	73 10.4	135 24.2	-23 25.0	181 56.3	-22 46.1
2	212 26.7	-22 16.1	103 15.4	165 22.9	-23 23.9	211 57.3	-22 46.6
4	242 26.2	-22 16.7	133 20.3	195 21.5	-23 22.8	241 58.3	-22 47.1
6	272 25.7	-22 17.4	163 25.2	225 20.2	-23 21.7	271 59.3	-22 47.6
8	302 25.2	-22 18.0	193 30.2	255 18.9	-23 20.5	302 .3	-22 48.1
10	332 24.7	-22 18.7	223 35.1	285 17.5	-23 19.4	332 1.3	-22 48.6
12	2 24.2	-22 19.3	253 40.0	315 16.2	-23 18.3	2 2.3	-22 49.1
14	32 23.6	-22 20.0	283 44.9	345 14.9	-23 17.1	32 3.3	-22 49.6
16	62 23.1	-22 20.6	313 49.9	15 13.6	-23 16.0	62 4.3	-22 50.1
18	92 22.6	-22 21.3	343 54.8	45 12.2	-23 14.9	92 5.3	-22 50.6
20	122 22.1	-22 21.9	13 59.7	75 10.9	-23 13.7	122 6.3	-22 51.1
22	152 21.6	-22 22.6	44 4.7	105 9.6	-23 12.6	152 7.3	-22 51.6
Δ	-3	-3		-7	6	5	-3

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	110 26.5	147	-13 48.2	122	138 30.9	-21 53.4	260 37.7	5 18.5
2	139 33.9	147	-13 23.8	124	168 34.7	-21 53.2	290 42.4	5 18.4
4	168 41.4	148	-12 59.1	125	198 38.6	-21 53.1	320 47.1	5 18.3
6	197 49.0	148	-12 34.1	126	228 42.4	-21 52.9	350 51.8	5 18.2
8	226 56.7	149	-12 8.9	127	258 46.2	-21 52.7	20 56.5	5 18.2
10	256 4.4	149	-11 43.5	128	288 50.1	-21 52.6	51 1.2	5 18.1
12	285 12.3	150	-11 17.8	129	318 53.9	-21 52.4	81 5.9	5 18.0
14	314 20.2	150	-10 51.9	131	348 57.7	-21 52.2	111 10.5	5 17.9
16	343 28.2	150	-10 25.8	132	19 1.6	-21 52.1	141 15.2	5 17.9
18	12 36.2	150	- 9 59.5	133	49 5.4	-21 51.9	171 19.9	5 17.8
20	41 44.3	151	- 9 32.9	134	79 9.2	-21 51.7	201 24.6	5 17.7
22	70 52.4	151	- 9 6.1	135	109 13.1	-21 51.6	231 29.3	5 17.6
Δ					19	1	23	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 41	14 59	0 55	2 41	12 21	.1	22 11	3.6
55	8 6	15 34	0 44	2 15	12 6	.4	22 24	3.3
50	7 41	15 60	0 38	1 58	11 55	.6	22 33	3.0
45	7 22	16 19	0 33	1 46	11 46	.8	22 41	2.8
40	7 6	16 35	0 30	1 37	11 38	1.0	22 47	2.6
35	6 52	16 48	0 28	1 30	11 31	1.1	22 52	2.5
30	6 41	16 60	0 26	1 25	11 25	1.2	22 57	2.4
20	6 21	17 20	0 24	1 18	11 15	1.4	23 5	2.1
10	6 3	17 38	0 23	1 15	11 6	1.6	23 12	2.0
0	5 47	17 54	0 22	1 14	10 58	1.8	23 18	1.8
10	5 30	18 11	0 23	1 17	10 49	2.0	23 25	1.6
20	5 12	18 29	0 24	1 23	10 40	2.1	23 32	1.4
30	4 51	18 50	0 27	1 35	10 30	2.4	23 39	1.2
35	4 39	19 2	0 29	1 45	10 24	2.5	23 44	1.1
40	4 25	19 16	0 32	1 60	10 17	2.6	23 48	.9
45	4 8	19 33	0 37	2 26	10 9	2.8	23 54	.8
50	3 47	19 54	0 43	: ::	9 59	3.0	.. ..	.0
55	3 19	20 22	0 55	: ::	9 47	3.2	.. ..	.0
60	2 39	21 3	1 27	: ::	9 31	3.6	0 19	.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	9 49.0	-1.0	16.3	$T_{\overline{m}}$	17 8	1.8	55.0	15.0
12	9 36.7	$T_{\overline{m}_\odot}$	11 h 50.4 min	Starost	6.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	14 59	.1	62	-4.0	♃	14 44	.0	65	-1.8
♂	11 52	.1	109	1.3	♄	6 36	.0	187	1.0

5. DECEMBAR PETAK

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 21.1	-22 23.2	74 9.6	135 8.3	-23 11.4	182 8.3	-22 52.1
2	212 20.5	-22 23.8	104 14.5	165 7.0	-23 10.3	212 9.3	-22 52.6
4	242 20.0	-22 24.4	134 19.4	195 5.7	-23 9.1	242 10.3	-22 53.1
6	272 19.5	-22 25.1	164 24.4	225 4.4	-23 7.9	272 11.3	-22 53.6
8	302 19.0	-22 25.7	194 29.3	255 3.1	-23 6.8	302 12.3	-22 54.1
10	332 18.5	-22 26.3	224 34.2	285 1.8	-23 5.6	332 13.3	-22 54.6
12	2 17.9	-22 26.9	254 39.2	315 .5	-23 4.4	2 14.3	-22 55.1
14	32 17.4	-22 27.5	284 44.1	344 59.2	-23 3.2	32 15.3	-22 55.6
16	62 16.9	-22 28.1	314 49.0	14 57.9	-23 2.0	62 16.3	-22 56.1
18	92 16.4	-22 28.7	344 53.9	44 56.6	-23 .8	92 17.3	-22 56.5
20	122 15.8	-22 29.3	14 58.9	74 55.3	-22 59.6	122 18.3	-22 57.0
22	152 15.3	-22 29.9	45 3.8	104 54.1	-22 58.4	152 19.3	-22 57.5
Δ	-3	-3		-6	6	5	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{h}	δ_{h}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	100 .5	151	- 8 39.2	136	139 16.9	-21 51.4	261 34.0	5 17.6
2	129 8.7	151	- 8 12.0	137	169 20.7	-21 51.2	291 38.7	5 17.5
4	158 16.8	151	- 7 44.7	138	199 24.6	-21 51.1	321 43.4	5 17.4
6	187 25.0	151	- 7 17.2	138	229 28.4	-21 50.9	351 48.1	5 17.3
8	216 33.2	151	- 6 49.5	139	259 32.2	-21 50.7	21 52.8	5 17.3
10	245 41.4	151	- 6 21.6	140	289 36.0	-21 50.6	51 57.5	5 17.2
12	274 49.5	151	- 5 53.6	141	319 39.9	-21 50.4	82 2.2	5 17.1
14	303 57.6	150	- 5 25.4	142	349 43.7	-21 50.2	112 6.9	5 17.1
16	333 5.7	150	- 4 57.0	142	19 47.5	-21 50.0	142 11.7	5 17.0
18	2 13.7	150	- 4 28.5	143	49 51.4	-21 49.9	172 16.4	5 16.9
20	31 21.6	149	- 3 59.9	144	79 55.2	-21 49.7	202 21.1	5 16.8
22	60 29.5	149	- 3 31.1	144	109 59.0	-21 49.5	232 25.8	5 16.8
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 43	14 58	0 55	2 42	12 23	.1	23 38	3.7
55	8 8	15 34	0 44	2 15	12 15	.4	23 42	3.3
50	7 42	15 59	0 38	1 58	12 10	.6	23 45	3.1
45	7 23	16 19	0 33	1 46	12 5	.8	23 48	2.9
40	7 7	16 35	0 30	1 37	12 1	.9	23 50	2.7
35	6 53	16 48	0 28	1 30	11 58	1.1	23 52	2.6
30	6 42	16 60	0 26	1 25	11 55	1.2	23 54	2.4
20	6 21	17 20	0 24	1 18	11 50	1.4	23 56	2.2
10	6 4	17 38	0 23	1 15	11 45	1.6	23 59	2.0
0	5 47	17 55	0 22	1 15	11 41	1.8	.. ..	.0
10	5 30	18 11	0 23	1 17	11 36	2.0	.. ..	.0
20	5 12	18 29	0 24	1 23	11 32	2.2	.. ..	.0
30	4 51	18 51	0 27	1 35	11 26	2.4	.. ..	.0
35	4 39	19 3	0 29	1 45	11 23	2.5	.. ..	.0
40	4 25	19 17	0 32	2 0	11 20	2.7	.. ..	.0
45	4 8	19 34	0 37	2 27	11 16	2.8	.. ..	.0
50	3 46	19 56	0 43	: ::	11 11	3.0	0 1	.6
55	3 18	20 24	0 55	: ::	11 5	3.3	0 10	.4
60	2 38	21 5	1 29	: ::	10 57	3.6	0 21	.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′		h min	min	′	′
00	9 24.4	-1.0	16.3	$T_{\overline{m}}$	17 51	1.8	55.7	15.2
12	9 11.9	$T_{\overline{m}_\odot}$	11 h 50.8 min	Starost	7.3 d	Faza	◐	

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 0	.1	61	-4.0	♃	14 41	.0	65	-1.8
♂	11 51	.1	108	1.3	♄	6 33	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 14.8	-22 30.5	75 8.7	134 52.8	-22 57.2	182 20.2	-22 58.0
2	212 14.3	-22 31.1	105 13.6	164 51.5	-22 56.0	212 21.2	-22 58.5
4	242 13.7	-22 31.7	135 18.6	194 50.2	-22 54.8	242 22.2	-22 58.9
6	272 13.2	-22 32.3	165 23.5	224 49.0	-22 53.6	272 23.2	-22 59.4
8	302 12.7	-22 32.9	195 28.4	254 47.7	-22 52.4	302 24.2	-22 59.9
10	332 12.1	-22 33.5	225 33.4	284 46.4	-22 51.1	332 25.2	-23 .3
12	2 11.6	-22 34.0	255 38.3	314 45.2	-22 49.9	2 26.2	-23 .8
14	32 11.1	-22 34.6	285 43.2	344 43.9	-22 48.7	32 27.1	-23 1.3
16	62 10.5	-22 35.2	315 48.1	14 42.6	-22 47.4	62 28.1	-23 1.7
18	92 10.0	-22 35.7	345 53.1	44 41.4	-22 46.2	92 29.1	-23 2.2
20	122 9.5	-22 36.3	15 58.0	74 40.1	-22 44.9	122 30.1	-23 2.7
22	152 8.9	-22 36.9	46 2.9	104 38.9	-22 43.7	152 31.1	-23 3.1
Δ	-3	-3		-6	6	5	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	89 37.3	149	-3 2.2	145	140 2.8	-21 49.4	262 30.5	5 16.7
2	118 45.1	148	-2 33.2	146	170 6.7	-21 49.2	292 35.2	5 16.6
4	147 52.7	148	-2 4.1	146	200 10.5	-21 49.0	322 39.9	5 16.6
6	177 .2	147	-1 34.8	147	230 14.3	-21 48.9	352 44.6	5 16.5
8	206 7.6	146	-1 5.5	147	260 18.1	-21 48.7	22 49.3	5 16.4
10	235 14.8	146	-0 36.0	148	290 21.9	-21 48.5	52 54.0	5 16.3
12	264 21.9	145	-0 6.5	148	320 25.8	-21 48.3	82 58.7	5 16.3
14	293 28.9	144	0 23.1	148	350 29.6	-21 48.2	113 3.4	5 16.2
16	322 35.7	143	0 52.8	149	20 33.4	-21 48.0	143 8.2	5 16.1
18	351 42.3	142	1 22.5	149	50 37.2	-21 47.8	173 12.9	5 16.1
20	20 48.8	141	1 52.3	149	80 41.1	-21 47.7	203 17.6	5 16.0
22	49 55.1	140	2 22.2	149	110 44.9	-21 47.5	233 22.3	5 15.9
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 45	14 57	0 56	2 42	12 24	.1	. . .	.0
55	8 9	15 33	0 45	2 16	12 24	.4	. . .	.0
50	7 43	15 59	0 38	1 58	12 24	.6	. . .	.0
45	7 24	16 19	0 33	1 46	12 24	.8	. . .	.0
40	7 8	16 35	0 30	1 37	12 24	1.0	. . .	.0
35	6 54	16 48	0 28	1 30	12 24	1.1	. . .	.0
30	6 42	17 0	0 26	1 25	12 24	1.3	. . .	.0
20	6 22	17 20	0 24	1 18	12 24	1.5	. . .	.0
10	6 4	17 38	0 23	1 15	12 24	1.7	. . .	.0
0	5 48	17 55	0 22	1 15	12 24	1.9	0 1	1.8
10	5 31	18 12	0 23	1 17	12 24	2.1	0 3	1.6
20	5 12	18 30	0 24	1 23	12 24	2.3	0 6	1.4
30	4 51	18 51	0 27	1 35	12 24	2.5	0 8	1.2
35	4 39	19 4	0 29	1 45	12 24	2.6	0 10	1.1
40	4 25	19 18	0 32	2 1	12 24	2.8	0 11	1.0
45	4 7	19 35	0 37	2 27	12 24	2.9	0 13	.8
50	3 46	19 57	0 44	: ::	12 24	3.2	0 16	.6
55	3 18	20 25	0 56	: ::	12 24	3.4	0 19	.4
60	2 37	21 7	1 31	: ::	12 24	3.8	0 22	.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	8 59.3	-1.1	16.3	T_m	18 34	1.9	56.4	15.4
12	8 46.5	$T_{m_\odot}$	11 h 51.2 min	Starost	8.3 d	Faza	◐	

PLANETE								
Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 1	.2	60	-4.1	♃	14 38	.0	65	-1.8
♂	11 50	.1	107	1.3	♄	6 29	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 8.4	-22 37.4	76 7.9	134 37.7	-22 42.4	182 32.0	-23 3.6
2	212 7.9	-22 38.0	106 12.8	164 36.4	-22 41.2	212 33.0	-23 4.0
4	242 7.3	-22 38.5	136 17.7	194 35.2	-22 39.9	242 34.0	-23 4.5
6	272 6.8	-22 39.1	166 22.6	224 33.9	-22 38.6	272 35.0	-23 5.0
8	302 6.2	-22 39.6	196 27.6	254 32.7	-22 37.3	302 35.9	-23 5.4
10	332 5.7	-22 40.2	226 32.5	284 31.5	-22 36.1	332 36.9	-23 5.9
12	2 5.1	-22 40.7	256 37.4	314 30.2	-22 34.8	2 37.9	-23 6.3
14	32 4.6	-22 41.3	286 42.4	344 29.0	-22 33.5	32 38.9	-23 6.8
16	62 4.1	-22 41.8	316 47.3	14 27.8	-22 32.2	62 39.8	-23 7.2
18	92 3.5	-22 42.3	346 52.2	44 26.6	-22 30.9	92 40.8	-23 7.6
20	122 3.0	-22 42.8	16 57.1	74 25.4	-22 29.6	122 41.8	-23 8.1
22	152 2.4	-22 43.4	47 2.1	104 24.1	-22 28.3	152 42.7	-23 8.5
Δ	-3	-3		-6	6	5	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	79 1.1	139	2 52.0	150	140 48.7	-21 47.3	263 27.0	5 15.9
2	108 6.9	138	3 22.0	150	170 52.5	-21 47.1	293 31.7	5 15.8
4	137 12.5	137	3 51.9	150	200 56.3	-21 47.0	323 36.4	5 15.7
6	166 17.9	136	4 21.9	150	231 .1	-21 46.8	353 41.2	5 15.7
8	195 23.0	134	4 51.8	150	261 4.0	-21 46.6	23 45.9	5 15.6
10	224 27.9	133	5 21.8	150	291 7.8	-21 46.4	53 50.6	5 15.5
12	253 32.5	132	5 51.7	150	321 11.6	-21 46.3	83 55.3	5 15.5
14	282 36.8	130	6 21.7	149	351 15.4	-21 46.1	114 .0	5 15.4
16	311 40.8	129	6 51.6	149	21 19.2	-21 45.9	144 4.7	5 15.3
18	340 44.5	127	7 21.4	149	51 23.0	-21 45.7	174 9.5	5 15.3
20	9 47.9	125	7 51.2	149	81 26.9	-21 45.6	204 14.2	5 15.2
22	38 51.0	124	8 21.0	148	111 30.7	-21 45.4	234 18.9	5 15.1
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 47	14 56	0 56	2 43	12 26	.1	1 7	3.9
55	8 10	15 33	0 45	2 16	12 33	.4	1 3	3.5
50	7 45	15 59	0 38	1 58	12 39	.7	1 0	3.2
45	7 25	16 18	0 33	1 46	12 44	.9	0 58	3.0
40	7 9	16 35	0 30	1 37	12 48	1.1	0 55	2.8
35	6 55	16 48	0 28	1 30	12 51	1.2	0 54	2.7
30	6 43	17 0	0 26	1 25	12 54	1.4	0 52	2.5
20	6 23	17 21	0 24	1 18	12 59	1.6	0 49	2.3
10	6 5	17 39	0 23	1 15	13 4	1.8	0 47	2.1
0	5 48	17 55	0 22	1 15	13 8	2.0	0 45	1.9
10	5 31	18 12	0 23	1 17	13 13	2.2	0 43	1.7
20	5 13	18 31	0 24	1 23	13 18	2.4	0 40	1.5
30	4 51	18 52	0 27	1 36	13 23	2.6	0 38	1.3
35	4 39	19 5	0 29	1 46	13 27	2.8	0 36	1.2
40	4 25	19 19	0 32	2 1	13 30	2.9	0 34	1.0
45	4 7	19 36	0 37	2 28	13 35	3.1	0 32	.9
50	3 46	19 58	0 44	: ::	13 40	3.3	0 30	.6
55	3 17	20 27	0 56	: ::	13 46	3.6	0 27	.4
60	2 36	21 9	1 32	: ::	13 55	4.0	0 24	.1
S								

SUNCE				MESEC				
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	8 33.7	-1.1	16.3	T_m	19 20	2.0	57.3	15.6
12	8 20.7	$T_{m_\odot}$	11 h 51.7 min	Starost	9.3 d	Faza	◐	

PLANETE								
Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 2	.2	58	-4.1	♃	14 35	.0	65	-1.8
♂	11 49	.1	106	1.3	♄	6 25	.0	187	1.0

8. DECEMBAR 2008. PONEDELJAK

UT	SUNCE S☉	δ☉	PROLEĆ. TAČKA S♈	VENERA S♀	δ♀	MARS S♂	δ♂
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	182 1.9	-22 43.9	77 7.0	134 22.9	-22 27.0	182 43.7	-23 9.0
2	212 1.3	-22 44.4	107 11.9	164 21.7	-22 25.7	212 44.7	-23 9.4
4	242 .8	-22 44.9	137 16.9	194 20.5	-22 24.4	242 45.6	-23 9.8
6	272 .2	-22 45.4	167 21.8	224 19.3	-22 23.1	272 46.6	-23 10.3
8	301 59.7	-22 45.9	197 26.7	254 18.1	-22 21.7	302 47.6	-23 10.7
10	331 59.1	-22 46.4	227 31.6	284 16.9	-22 20.4	332 48.5	-23 11.1
12	1 58.6	-22 47.0	257 36.6	314 15.7	-22 19.1	2 49.5	-23 11.6
14	31 58.0	-22 47.4	287 41.5	344 14.5	-22 17.7	32 50.5	-23 12.0
16	61 57.5	-22 47.9	317 46.4	14 13.4	-22 16.4	62 51.4	-23 12.4
18	91 56.9	-22 48.4	347 51.4	44 12.2	-22 15.1	92 52.4	-23 12.9
20	121 56.4	-22 48.9	17 56.3	74 11.0	-22 13.7	122 53.3	-23 13.3
22	151 55.8	-22 49.4	48 1.2	104 9.8	-22 12.4	152 54.3	-23 13.7
Δ	-3	-3		-6	7	5	-2

UT	MESEC S☾	Δ	δ☾	Δ	JUPITER S♃	δ♃	SATURN S♄	δ♄
h	° ′		° ′		° ′	° ′	° ′	° ′
0	67 53.7	122	8 50.6	148	141 34.5	-21 45.2	264 23.6	5 15.1
2	96 56.0	120	9 20.2	147	171 38.3	-21 45.0	294 28.3	5 15.0
4	125 58.1	118	9 49.7	147	201 42.1	-21 44.9	324 33.1	5 14.9
6	154 59.7	116	10 19.0	146	231 45.9	-21 44.7	354 37.8	5 14.9
8	184 .9	114	10 48.3	146	261 49.7	-21 44.5	24 42.5	5 14.8
10	213 1.8	112	11 17.4	145	291 53.6	-21 44.3	54 47.2	5 14.8
12	242 2.3	110	11 46.4	144	321 57.4	-21 44.2	84 52.0	5 14.7
14	271 2.3	108	12 15.2	143	352 1.2	-21 44.0	114 56.7	5 14.6
16	300 1.9	106	12 43.8	142	22 5.0	-21 43.8	145 1.4	5 14.6
18	329 1.1	104	13 12.3	141	52 8.8	-21 43.6	175 6.2	5 14.5
20	357 59.8	101	13 40.5	140	82 12.6	-21 43.5	205 10.9	5 14.4
22	26 58.1	99	14 8.6	139	112 16.4	-21 43.3	235 15.6	5 14.4
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 48	14 56	0 56	2 43	12 28	.2	2 40	4.2
55	8 12	15 32	0 45	2 16	12 44	.6	2 27	3.7
50	7 46	15 58	0 38	1 59	12 56	.9	2 18	3.4
45	7 26	16 18	0 34	1 46	13 6	1.1	2 10	3.2
40	7 9	16 35	0 30	1 37	13 14	1.3	2 4	3.0
35	6 56	16 48	0 28	1 30	13 21	1.4	1 58	2.8
30	6 44	17 0	0 26	1 25	13 27	1.6	1 53	2.7
20	6 23	17 21	0 24	1 18	13 38	1.8	1 45	2.5
10	6 5	17 39	0 23	1 15	13 47	2.0	1 38	2.3
0	5 48	17 56	0 22	1 15	13 56	2.2	1 31	2.1
10	5 31	18 13	0 23	1 17	14 5	2.4	1 24	1.9
20	5 13	18 31	0 24	1 24	14 15	2.6	1 17	1.7
30	4 52	18 53	0 27	1 36	14 26	2.8	1 9	1.5
35	4 39	19 5	0 29	1 46	14 33	2.9	1 4	1.3
40	4 24	19 20	0 33	2 1	14 41	3.1	0 59	1.2
45	4 7	19 37	0 37	2 29	14 49	3.3	0 53	1.0
50	3 45	19 59	0 44	: ::	14 60	3.5	0 46	.8
55	3 17	20 28	0 56	: ::	15 13	3.9	0 37	.5
60	2 35	21 10	1 34	: ::	15 31	4.3	0 25	.1
S								

UT	SUNCE $e = T_p - UT$	Δ/24	r	MESEC Prolaz	Δ/24	π☾	r
h	min s	s	′	h min	min	′	′
00	8 7.7	-1.1	16.3	T_m 20 8	2.2	58.3	15.9
12	7 54.4	$T_{m☉}$ 11 h 52.1 min		Starost 10.3 d		Faza ◐	

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 3	.2	57	-4.1	♃	14 32	.0	64	-1.8
♂	11 49	.1	106	1.3	♄	6 21	.0	187	1.0

9. DECEMBAR UTORAK

UT	SUNCE S☉	δ☉	PROLEĆ. TAČKA S♈	VENERA S♀	δ♀	MARS S♂	δ♂
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 55.2	-22 49.9	78 6.1	134 8.6	-22 11.0	182 55.3	-23 14.1
2	211 54.7	-22 50.4	108 11.1	164 7.5	-22 9.7	212 56.2	-23 14.5
4	241 54.1	-22 50.9	138 16.0	194 6.3	-22 8.3	242 57.2	-23 15.0
6	271 53.6	-22 51.3	168 20.9	224 5.1	-22 6.9	272 58.1	-23 15.4
8	301 53.0	-22 51.8	198 25.8	254 4.0	-22 5.5	302 59.1	-23 15.8
10	331 52.4	-22 52.3	228 30.8	284 2.8	-22 4.2	333 .0	-23 16.2
12	1 51.9	-22 52.7	258 35.7	314 1.6	-22 2.8	3 1.0	-23 16.6
14	31 51.3	-22 53.2	288 40.6	344 .5	-22 1.4	33 2.0	-23 17.0
16	61 50.8	-22 53.7	318 45.6	13 59.3	-22 .0	63 2.9	-23 17.4
18	91 50.2	-22 54.1	348 50.5	43 58.2	-21 58.6	93 3.9	-23 17.8
20	121 49.6	-22 54.6	18 55.4	73 57.0	-21 57.2	123 4.8	-23 18.2
22	151 49.1	-22 55.0	49 .3	103 55.9	-21 55.8	153 5.8	-23 18.7
Δ	-3	-2		-6	7	5	-2

UT	MESEC S☾	Δ	δ☾	Δ	JUPITER S♃	δ♃	SATURN S♄	δ♄
h	° ′		° ′		° ′	° ′	° ′	° ′
0	55 55.9	97	14 36.4	138	142 20.2	-21 43.1	265 20.3	5 14.3
2	84 53.2	94	15 3.9	137	172 24.0	-21 42.9	295 25.1	5 14.3
4	113 50.1	92	15 31.2	135	202 27.8	-21 42.7	325 29.8	5 14.2
6	142 46.4	89	15 58.2	134	232 31.6	-21 42.6	355 34.5	5 14.1
8	171 42.3	87	16 25.0	132	262 35.4	-21 42.4	25 39.3	5 14.1
10	200 37.7	84	16 51.4	131	292 39.3	-21 42.2	55 44.0	5 14.0
12	229 32.5	82	17 17.5	129	322 43.1	-21 42.0	85 48.7	5 14.0
14	258 26.8	79	17 43.3	127	352 46.9	-21 41.8	115 53.5	5 13.9
16	287 20.6	76	18 8.7	125	22 50.7	-21 41.7	145 58.2	5 13.9
18	316 13.9	74	18 33.7	123	52 54.5	-21 41.5	176 2.9	5 13.8
20	345 6.6	71	18 58.4	121	82 58.3	-21 41.3	206 7.7	5 13.7
22	13 58.8	68	19 22.6	119	113 2.1	-21 41.1	236 12.4	5 13.7
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	Δ/24	MESEC ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 50	14 55	0 56	2 44	12 33	.4	4 20	4.5
55	8 13	15 32	0 45	2 16	12 58	.9	3 57	4.0
50	7 47	15 58	0 38	1 59	13 17	1.2	3 40	3.6
45	7 27	16 18	0 34	1 46	13 32	1.4	3 27	3.4
40	7 10	16 35	0 30	1 37	13 44	1.6	3 16	3.2
35	6 57	16 48	0 28	1 30	13 55	1.7	3 6	3.0
30	6 44	17 0	0 26	1 25	14 5	1.9	2 58	2.9
20	6 24	17 21	0 24	1 18	14 21	2.1	2 44	2.7
10	6 6	17 39	0 23	1 15	14 35	2.2	2 32	2.5
0	5 49	17 56	0 22	1 15	14 49	2.4	2 21	2.3
10	5 32	18 13	0 23	1 17	15 2	2.6	2 9	2.1
20	5 13	18 32	0 24	1 24	15 17	2.8	1 57	1.9
30	4 52	18 53	0 27	1 36	15 34	3.0	1 44	1.7
35	4 39	19 6	0 30	1 46	15 44	3.1	1 36	1.6
40	4 25	19 21	0 33	2 2	15 55	3.3	1 27	1.4
45	4 7	19 38	0 37	2 30	16 8	3.4	1 16	1.2
50	3 45	20 0	0 44	: ::	16 25	3.7	1 4	1.0
55	3 16	20 29	0 57	: ::	16 46	4.0	0 49	.7
60	2 34	21 12	1 35	: ::	17 15	4.6	0 28	.2
S								

UT	SUNCE $e = T_p - UT$	Δ/24	r	MESEC Prolaz	Δ/24	π☾	r
h	min s	s	′	h min	min	′	′
00	7 41.1	-1.1	16.3	T_m 21 2	2.5	59.2	16.1
12	7 27.6	$T_{m☉}$ 11 h 52.5 min		Starost 11.3 d		Faza ◐	

PLANETE

Pl.	T_m	π	360−α	Vel.	Pl.	T_m	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 4	.2	56	-4.1	♃	14 29	.0	64	-1.8
♂	11 48	.1	105	1.3	♄	6 18	.0	187	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 48.5	-22 55.5	79 5.3	133 54.8	-21 54.4	183 6.7	-23 19.1
2	211 47.9	-22 55.9	109 10.2	163 53.6	-21 53.0	213 7.7	-23 19.5
4	241 47.4	-22 56.3	139 15.1	193 52.5	-21 51.6	243 8.6	-23 19.9
6	271 46.8	-22 56.8	169 20.1	223 51.4	-21 50.2	273 9.6	-23 20.2
8	301 46.2	-22 57.2	199 25.0	253 50.2	-21 48.8	303 10.5	-23 20.6
10	331 45.7	-22 57.6	229 29.9	283 49.1	-21 47.4	333 11.4	-23 21.0
12	1 45.1	-22 58.1	259 34.8	313 48.0	-21 45.9	3 12.4	-23 21.4
14	31 44.5	-22 58.5	289 39.8	343 46.9	-21 44.5	33 13.3	-23 21.8
16	61 44.0	-22 58.9	319 44.7	13 45.7	-21 43.1	63 14.3	-23 22.2
18	91 43.4	-22 59.3	349 49.6	43 44.6	-21 41.6	93 15.2	-23 22.6
20	121 42.8	-22 59.8	19 54.6	73 43.5	-21 40.2	123 16.2	-23 23.0
22	151 42.2	-23 .2	49 59.5	103 42.4	-21 38.7	153 17.1	-23 23.4
Δ	-3	-2		-6	7	5	-2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	42 50.4	66	19 46.4	117	143 5.9	-21 40.9	266 17.2	5 13.6
2	71 41.6	63	20 9.8	115	173 9.7	-21 40.8	296 21.9	5 13.6
4	100 32.1	60	20 32.7	112	203 13.5	-21 40.6	326 26.6	5 13.5
6	129 22.1	57	20 55.1	110	233 17.3	-21 40.4	356 31.4	5 13.4
8	158 11.6	55	21 17.0	107	263 21.1	-21 40.2	26 36.1	5 13.4
10	187 .5	52	21 38.4	104	293 24.9	-21 40.0	56 40.8	5 13.3
12	215 48.9	49	21 59.3	102	323 28.7	-21 39.9	86 45.6	5 13.3
14	244 36.8	47	22 19.6	99	353 32.5	-21 39.7	116 50.3	5 13.2
16	273 24.1	44	22 39.4	96	23 36.3	-21 39.5	146 55.1	5 13.2
18	302 10.9	41	22 58.5	93	53 40.1	-21 39.3	176 59.8	5 13.1
20	330 57.1	39	23 17.1	90	83 43.9	-21 39.1	207 4.6	5 13.1
22	359 42.9	36	23 35.0	86	113 47.7	-21 39.0	237 9.3	5 13.0
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 51	14 54	0 57	2 44	12 41	.8	6 7	4.6
55	8 14	15 32	0 45	2 17	13 19	1.3	5 32	4.0
50	7 48	15 58	0 38	1 59	13 45	1.7	5 7	3.7
45	7 28	16 18	0 34	1 46	14 6	1.9	4 48	3.4
40	7 11	16 35	0 30	1 37	14 23	2.0	4 32	3.3
35	6 57	16 49	0 28	1 30	14 37	2.1	4 19	3.1
30	6 45	17 1	0 26	1 25	14 49	2.2	4 7	3.0
20	6 24	17 21	0 24	1 18	15 10	2.4	3 48	2.8
10	6 6	17 40	0 23	1 15	15 29	2.5	3 31	2.7
0	5 49	17 57	0 22	1 15	15 47	2.6	3 15	2.5
10	5 32	18 14	0 23	1 17	16 4	2.8	2 60	2.4
20	5 14	18 33	0 24	1 24	16 23	2.9	2 43	2.2
30	4 52	18 54	0 27	1 36	16 45	3.1	2 24	2.0
35	4 39	19 7	0 30	1 46	16 58	3.1	2 13	1.9
40	4 25	19 22	0 33	2 2	17 13	3.3	2 1	1.8
45	4 7	19 39	0 37	2 30	17 31	3.4	1 46	1.6
50	3 45	20 1	0 44	: ::	17 53	3.6	1 28	1.4
55	3 16	20 30	0 57	: ::	18 23	3.9	1 5	1.0
60	2 33	21 13	1 37	: ::	19 7	4.6	0 34	.5
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	7 14.2	-1.1	16.3	$T_{\overline{m}}$ 22 1	2.7	60.1	16.4
12	7 .5	$T_{\overline{m}_\odot}$ 11 h 53.0 min		Starost 12.3 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 5	.2	55	-4.1	♄	14 26	.0	64	-1.8
♂	11 47	.1	104	1.3	♃	6 14	.0	187	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 41.7	-23 .6	80 4.4	133 41.3	-21 37.3	183 18.0	-23 23.7
2	211 41.1	-23 1.0	110 9.3	163 40.2	-21 35.8	213 19.0	-23 24.1
4	241 40.5	-23 1.4	140 14.3	193 39.1	-21 34.4	243 19.9	-23 24.5
6	271 39.9	-23 1.8	170 19.2	223 38.0	-21 32.9	273 20.9	-23 24.9
8	301 39.4	-23 2.2	200 24.1	253 36.9	-21 31.5	303 21.8	-23 25.3
10	331 38.8	-23 2.6	230 29.1	283 35.8	-21 30.0	333 22.7	-23 25.6
12	1 38.2	-23 3.0	260 34.0	313 34.8	-21 28.5	3 23.7	-23 26.0
14	31 37.6	-23 3.3	290 38.9	343 33.7	-21 27.0	33 24.6	-23 26.4
16	61 37.1	-23 3.7	320 43.8	13 32.6	-21 25.6	63 25.5	-23 26.7
18	91 36.5	-23 4.1	350 48.8	43 31.5	-21 24.1	93 26.5	-23 27.1
20	121 35.9	-23 4.5	20 53.7	73 30.5	-21 22.6	123 27.4	-23 27.5
22	151 35.3	-23 4.9	50 58.6	103 29.4	-21 21.1	153 28.3	-23 27.8
Δ	-3	-2		-5	7	5	-2

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	28 28.1	34	23 52.3	83	143 51.5	-21 38.8	267 14.1	5 13.0
2	57 12.9	31	24 8.9	80	173 55.3	-21 38.6	297 18.8	5 12.9
4	85 57.2	29	24 24.9	76	203 59.1	-21 38.4	327 23.5	5 12.8
6	114 41.0	27	24 40.1	73	234 2.9	-21 38.2	357 28.3	5 12.8
8	143 24.3	25	24 54.7	69	264 6.7	-21 38.0	27 33.0	5 12.7
10	172 7.2	22	25 8.5	65	294 10.5	-21 37.9	57 37.8	5 12.7
12	200 49.7	20	25 21.6	62	324 14.3	-21 37.7	87 42.5	5 12.6
14	229 31.8	19	25 33.9	58	354 18.1	-21 37.5	117 47.3	5 12.6
16	258 13.6	17	25 45.5	54	24 21.9	-21 37.3	147 52.0	5 12.5
18	286 54.9	15	25 56.3	50	54 25.7	-21 37.1	177 56.8	5 12.5
20	315 35.9	13	26 6.3	46	84 29.5	-21 36.9	208 1.5	5 12.4
22	344 16.6	12	26 15.5	42	114 33.2	-21 36.7	238 6.3	5 12.4
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 53	14 54	0 57	2 44	12 60	1.7	7 58	4.1
55	8 15	15 32	0 45	2 17	13 51	2.2	7 8	3.6
50	7 49	15 58	0 38	1 59	14 25	2.3	6 35	3.4
45	7 28	16 18	0 34	1 46	14 50	2.5	6 10	3.3
40	7 12	16 35	0 30	1 37	15 11	2.5	5 50	3.2
35	6 58	16 49	0 28	1 30	15 28	2.6	5 34	3.1
30	6 46	17 1	0 26	1 25	15 43	2.6	5 20	3.0
20	6 25	17 22	0 24	1 19	16 8	2.7	4 56	2.9
10	6 7	17 40	0 23	1 15	16 30	2.8	4 35	2.8
0	5 50	17 57	0 22	1 15	16 50	2.8	4 16	2.7
10	5 32	18 14	0 23	1 17	17 11	2.8	3 57	2.6
20	5 14	18 33	0 24	1 24	17 33	2.9	3 36	2.5
30	4 52	18 55	0 27	1 36	17 58	2.9	3 13	2.4
35	4 39	19 8	0 30	1 46	18 14	3.0	2 59	2.3
40	4 25	19 22	0 33	2 2	18 31	3.0	2 43	2.3
45	4 7	19 40	0 37	2 31	18 53	3.1	2 24	2.1
50	3 45	20 2	0 44	: ::	19 20	3.1	2 1	2.0
55	3 16	20 32	0 57	: ::	19 57	3.2	1 30	1.7
60	2 33	21 15	1 38	: ::	20 56	3.5	0 45	1.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	6 46.8	-1.2	16.3	$T_{\overline{m}}$ 23 6	2.8	60.9	16.6
12	6 33.0	$T_{\overline{m}_\odot}$ 11 h 53.5 min		Starost 13.3 d	Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 6	.2	54	-4.1	♄	14 23	.0	64	-1.8
♂	11 46	.1	103	1.3	♃	6 10	.0	187	1.0

UT	SUNCE $S_\odot$		$\delta_\odot$		PROLEĆ. TAČKA S_Υ		VENERA S_φ		δ_φ		MARS S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	181	34.7	-23	5.2	81	3.6	133	28.3	-21	19.6	183	29.3	-23	28.2
2	211	34.2	-23	5.6	111	8.5	163	27.3	-21	18.1	213	30.2	-23	28.6
4	241	33.6	-23	6.0	141	13.4	193	26.2	-21	16.6	243	31.1	-23	28.9
6	271	33.0	-23	6.3	171	18.3	223	25.1	-21	15.1	273	32.1	-23	29.3
8	301	32.4	-23	6.7	201	23.3	253	24.1	-21	13.6	303	33.0	-23	29.6
10	331	31.8	-23	7.0	231	28.2	283	23.0	-21	12.1	333	33.9	-23	30.0
12	1	31.2	-23	7.4	261	33.1	313	22.0	-21	10.6	3	34.8	-23	30.3
14	31	30.6	-23	7.7	291	38.1	343	20.9	-21	9.0	33	35.8	-23	30.7
16	61	30.1	-23	8.1	321	43.0	13	19.9	-21	7.5	63	36.7	-23	31.0
18	91	29.5	-23	8.4	351	47.9	43	18.9	-21	6.0	93	37.6	-23	31.4
20	121	28.9	-23	8.8	21	52.8	73	17.8	-21	4.5	123	38.5	-23	31.7
22	151	28.3	-23	9.1	51	57.8	103	16.8	-21	2.9	153	39.5	-23	32.1
Δ		-3		-2				-5		8		5		-2

UT	MESEC $S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	JUPITER $S_\jupiter$		$\delta_\jupiter$		Δ	SATURN $S_\saturn$		$\delta_\saturn$		Δ
h	°	′		°	′		°	′	°	′		°	′	°	′	
0	12	57.0	11	26	23.9	38	144	37.0	-21	36.6		268	11.1	5	12.3	
2	41	37.1	9	26	31.4	34	174	40.8	-21	36.4		298	15.8	5	12.3	
4	70	17.0	8	26	38.2	29	204	44.6	-21	36.2		328	20.6	5	12.2	
6	98	56.6	7	26	44.1	25	234	48.4	-21	36.0		358	25.3	5	12.2	
8	127	36.1	6	26	49.1	21	264	52.2	-21	35.8		28	30.1	5	12.1	
10	156	15.4	6	26	53.3	17	294	56.0	-21	35.6		58	34.8	5	12.1	
12	184	54.6	5	26	56.6	12	324	59.8	-21	35.5		88	39.6	5	12.0	
14	213	33.6	5	26	59.0	8	355	3.6	-21	35.3		118	44.3	5	12.0	
16	242	12.6	5	27	.6	4	25	7.4	-21	35.1		148	49.1	5	11.9	
18	270	51.5	5	27	1.3	-1	55	11.2	-21	34.9		178	53.9	5	11.9	
20	299	30.4	5	27	1.1	-5	85	14.9	-21	34.7		208	58.6	5	11.8	
22	328	9.4	5	27	.1	-10	115	18.7	-21	34.5		239	3.4	5	11.8	
Δ								19		1			24		0	

φ	SUNCE IZLAZ		SUNCE ZALAZ		TRAJANJE SUMRAKA GRAĐ.		TRAJANJE SUMRAKA ASTR.		MESEC IZLAZ		MESEC Δ/24		MESEC ZALAZ		MESEC Δ/24	
N	h	min	h	min	h	min	h	min	h	min	min		h	min	min	
60	8	54	14	54	0	57	2	45	13	41	3.3		9	36	2.6	
55	8	16	15	31	0	45	2	17	14	43	3.2		8	34	2.7	
50	7	50	15	58	0	38	1	59	15	21	3.1		7	56	2.8	
45	7	29	16	18	0	34	1	47	15	49	3.0		7	28	2.8	
40	7	13	16	35	0	30	1	37	16	12	3.0		7	6	2.8	
35	6	59	16	49	0	28	1	31	16	30	3.0		6	48	2.8	
30	6	47	17	1	0	26	1	25	16	46	2.9		6	32	2.8	
20	6	26	17	22	0	24	1	19	17	13	2.9		6	6	2.8	
10	6	7	17	40	0	23	1	15	17	36	2.8		5	43	2.8	
0	5	50	17	58	0	22	1	15	17	57	2.8		5	22	2.8	
10	5	33	18	15	0	23	1	18	18	19	2.8		5	0	2.8	
20	5	14	18	34	0	25	1	24	18	42	2.7		4	38	2.8	
30	4	52	18	56	0	27	1	36	19	9	2.6		4	11	2.8	
35	4	40	19	8	0	30	1	47	19	25	2.6		3	55	2.8	
40	4	25	19	23	0	33	2	2	19	44	2.6		3	37	2.8	
45	4	7	19	41	0	37	2	31	20	6	2.5		3	15	2.8	
50	3	45	20	3	0	44	:	::	20	35	2.4		2	48	2.7	
55	3	16	20	33	0	57	:	::	21	14	2.2		2	10	2.7	
60	2	32	21	16	1	40	:	::	22	19	1.7		1	10	2.5	
S																

SUNCE UT	SUNCE $e=T_p-UT$		SUNCE Δ/24	SUNCE r	MESEC Prolaz		MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min	s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	6	19.1	-1.2	16.3		. . .	1.0	61.3	16.7
12	6	5.0	$T_{\overline{m}_\odot}$	11 h 53.9 min	Starost 14.3 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$		π	360−α	Vel.	Pl.	$T_{\overline{m}}$		π	360−α	Vel.
	h	min	′	°			h	min	′	°	
♀	15	7	.2	52	-4.1	♄	14	20	.0	64	-1.8
♂	11	46	.1	102	1.3	♃	6	6	.0	187	1.0

UT	SUNCE $S_\odot$		$\delta_\odot$		PROLEĆ. TAČKA S_Υ		VENERA S_φ		δ_φ		MARS S_σ		δ_σ	
h	°	′	°	′	°	′	°	′	°	′	°	′	°	′
0	181	27.7	-23	9.4	82	2.7	133	15.8	-21	1.4	183	40.4	-23	32.4
2	211	27.1	-23	9.8	112	7.6	163	14.7	-20	59.8	213	41.3	-23	32.8
4	241	26.5	-23	10.1	142	12.5	193	13.7	-20	58.3	243	42.2	-23	33.1
6	271	25.9	-23	10.4	172	17.5	223	12.7	-20	56.7	273	43.2	-23	33.4
8	301	25.4	-23	10.7	202	22.4	253	11.7	-20	55.2	303	44.1	-23	33.8
10	331	24.8	-23	11.0	232	27.3	283	10.7	-20	53.6	333	45.0	-23	34.1
12	1	24.2	-23	11.4	262	32.3	313	9.7	-20	52.1	3	45.9	-23	34.4
14	31	23.6	-23	11.7	292	37.2	343	8.7	-20	50.5	33	46.8	-23	34.8
16	61	23.0	-23	12.0	322	42.1	13	7.7	-20	48.9	63	47.8	-23	35.1
18	91	22.4	-23	12.3	352	47.0	43	6.7	-20	47.4	93	48.7	-23	35.4
20	121	21.8	-23	12.6	22	52.0	73	5.7	-20	45.8	123	49.6	-23	35.8
22	151	21.2	-23	12.9	52	56.9	103	4.7	-20	44.2	153	50.5	-23	36.1
Δ		-3		-2				-5		8		5		-2

UT	MESEC $S_\leftmoon$		Δ	$\delta_\leftmoon$		Δ	JUPITER $S_\jupiter$		$\delta_\jupiter$		Δ	SATURN $S_\saturn$		$\delta_\saturn$		Δ
h	°	′		°	′		°	′	°	′		°	′	°	′	
0	356	48.3	5	26	58.2	-14	145	22.5	-21	34.3		269	8.2	5	11.7	
2	25	27.3	6	26	55.4	-18	175	26.3	-21	34.1		299	12.9	5	11.7	
4	54	6.5	6	26	51.8	-22	205	30.1	-21	34.0		329	17.7	5	11.7	
6	82	45.7	7	26	47.3	-27	235	33.9	-21	33.8		359	22.4	5	11.6	
8	111	25.1	8	26	41.9	-31	265	37.7	-21	33.6		29	27.2	5	11.6	
10	140	4.7	9	26	35.7	-35	295	41.5	-21	33.4		59	32.0	5	11.5	
12	168	44.5	10	26	28.6	-39	325	45.3	-21	33.2		89	36.7	5	11.5	
14	197	24.6	12	26	20.7	-44	355	49.0	-21	33.0		119	41.5	5	11.4	
16	226	4.9	13	26	12.0	-48	25	52.8	-21	32.8		149	46.3	5	11.4	
18	254	45.5	15	26	2.5	-52	55	56.6	-21	32.6		179	51.0	5	11.3	
20	283	26.4	16	25	52.1	-56	86	.4	-21	32.4		209	55.8	5	11.3	
22	312	7.6	18	25	41.0	-60	116	4.2	-21	32.3		240	.6	5	11.2	
Δ								19		1			24		0	

φ	SUNCE IZLAZ		SUNCE ZALAZ		TRAJANJE SUMRAKA GRAĐ.		TRAJANJE SUMRAKA ASTR.		MESEC IZLAZ		MESEC Δ/24		MESEC ZALAZ		MESEC Δ/24	
N	h	min	h	min	h	min	h	min	h	min	min		h	min	min	
60	8	55	14	53	0	57	2	45	15	1	4.5		10	38	1.2	
55	8	17	15	31	0	45	2	17	15	59	3.9		9	40	1.8	
50	7	51	15	58	0	38	1	59	16	35	3.6		9	2	2.0	
45	7	30	16	19	0	34	1	47	17	2	3.4		8	35	2.2	
40	7	13	16	35	0	30	1	37	17	23	3.3		8	14	2.3	
35	6	59	16	49	0	28	1	31	17	41	3.1		7	56	2.4	
30	6	47	17	1	0	26	1	25	17	56	3.1		7	40	2.5	
20	6	26	17	22	0	24	1	19	18	22	2.9		7	14	2.6	
10	6	8	17	41	0	23	1	15	18	44	2.8		6	51	2.7	
0	5	51	17	58	0	23	1	15	19	5	2.7		6	29	2.8	
10	5	33	18	16	0	23	1	18	19	25	2.5		6	8	2.8	
20	5	14	18	34	0	25	1	24	19	47	2.4		5	45	2.9	
30	4	53	18	56	0	27	1	36	20	13	2.3		5	18	3.0	
35	4	40	19	9	0	30	1	47	20	28	2.2		5	2	3.1	
40	4	25	19	24	0	33	2	3	20	45	2.0		4	44	3.2	
45	4	7	19	42	0	37	2	32	21	6	1.9		4	22	3.3	
50	3	45	20	4	0	44	:	::	21	32	1.7		3	53	3.4	
55	3	15	20	34	0	58	:	::	22	7	1.4		3	14	3.6	
60	2	32	21	18	1	41	:	::	23	1	.7		2	9	4.1	
S																

SUNCE UT	SUNCE $e=T_p-UT$		SUNCE Δ/24	SUNCE r	MESEC Prolaz		MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min	s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	5	51.0	-1.2	16.3		0 13	2.8	61.5	16.8
12	5	36.8	$T_{\overline{m}_\odot}$	11 h 54.4 min	Starost 15.3 d		Faza ○		

PLANETE

Pl.	$T_{\overline{m}}$		π	360−α	Vel.	Pl.	$T_{\overline{m}}$		π	360−α	Vel.
	h	min	′	°			h	min	′	°	
♀	15	7	.2	51	-4.1	♄	14	17	.0	63	-1.8
♂	11	45	.1	102	1.3	♃	6	2	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 20.6	-23 13.2	83 1.8	133 3.7	-20 42.6	183 51.4	-23 36.4
2	211 20.0	-23 13.5	113 6.8	163 2.7	-20 41.0	213 52.3	-23 36.7
4	241 19.4	-23 13.8	143 11.7	193 1.7	-20 39.4	243 53.2	-23 37.1
6	271 18.8	-23 14.0	173 16.6	223 .7	-20 37.9	273 54.2	-23 37.4
8	301 18.2	-23 14.3	203 21.5	252 59.8	-20 36.3	303 55.1	-23 37.7
10	331 17.6	-23 14.6	233 26.5	282 58.8	-20 34.7	333 56.0	-23 38.0
12	1 17.0	-23 14.9	263 31.4	312 57.8	-20 33.0	3 56.9	-23 38.3
14	31 16.4	-23 15.1	293 36.3	342 56.8	-20 31.4	33 57.8	-23 38.6
16	61 15.8	-23 15.4	323 41.3	12 55.9	-20 29.8	63 58.7	-23 38.9
18	91 15.2	-23 15.7	353 46.2	42 54.9	-20 28.2	93 59.6	-23 39.2
20	121 14.6	-23 15.9	23 51.1	72 54.0	-20 26.6	124 .5	-23 39.5
22	151 14.0	-23 16.2	53 56.0	102 53.0	-20 25.0	154 1.4	-23 39.9
Δ	-3	-1		-5	8	5	-2

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	340 49.2	20	25 29.1	-63	146 8.0	-21 32.1	270 5.3	5 11.2
2	9 31.2	22	25 16.4	-67	176 11.7	-21 31.9	300 10.1	5 11.2
4	38 13.5	24	25 3.0	-71	206 15.5	-21 31.7	330 14.9	5 11.1
6	66 56.3	26	24 48.8	-75	236 19.3	-21 31.5	0 19.7	5 11.1
8	95 39.5	28	24 33.9	-78	266 23.1	-21 31.3	30 24.4	5 11.0
10	124 23.2	31	24 18.2	-82	296 26.9	-21 31.1	60 29.2	5 11.0
12	153 7.3	33	24 1.9	-85	326 30.7	-21 30.9	90 34.0	5 10.9
14	181 51.9	35	23 44.9	-88	356 34.4	-21 30.7	120 38.7	5 10.9
16	210 36.9	38	23 27.3	-91	26 38.2	-21 30.5	150 43.5	5 10.9
18	239 22.5	40	23 9.0	-95	56 42.0	-21 30.4	180 48.3	5 10.8
20	268 8.6	43	22 50.0	-98	86 45.8	-21 30.2	210 53.1	5 10.8
22	296 55.1	45	22 30.5	-101	116 49.6	-21 30.0	240 57.9	5 10.7
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 56	14 53	0 57	2 45	16 48	4.6	11 7	.5
55	8 18	15 31	0 45	2 17	17 32	4.0	10 22	1.1
50	7 51	15 58	0 38	1 59	18 1	3.7	9 51	1.4
45	7 31	16 19	0 34	1 47	18 24	3.5	9 28	1.6
40	7 14	16 35	0 31	1 38	18 42	3.3	9 9	1.8
35	7 0	16 50	0 28	1 31	18 57	3.1	8 53	2.0
30	6 48	17 2	0 26	1 25	19 10	3.0	8 39	2.1
20	6 27	17 23	0 24	1 19	19 32	2.8	8 15	2.3
10	6 8	17 41	0 23	1 15	19 51	2.6	7 55	2.4
0	5 51	17 59	0 23	1 15	20 9	2.4	7 36	2.6
10	5 34	18 16	0 23	1 18	20 26	2.3	7 16	2.7
20	5 15	18 35	0 25	1 24	20 45	2.1	6 55	2.9
30	4 53	18 57	0 27	1 36	21 7	1.9	6 31	3.1
35	4 40	19 10	0 30	1 47	21 19	1.8	6 17	3.2
40	4 25	19 25	0 33	2 3	21 34	1.6	5 60	3.3
45	4 7	19 43	0 37	2 32	21 51	1.4	5 40	3.5
50	3 45	20 5	0 44	: ::	22 12	1.2	5 15	3.7
55	3 15	20 35	0 58	: ::	22 39	.9	4 40	4.0
60	2 31	21 19	1 42	: ::	23 18	.3	3 48	4.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	5 22.6	-1.2	16.3	$T_{\overline{m}}$ 1 20	2.6	61.3	16.7
12	5 8.3	$T_{\overline{m}_\odot}$ 11 h 54.9 min		Starost 16.3 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 8	.2	50	-4.1	♄	14 14	.0	63	-1.8
♂	11 44	.1	101	1.3	♃	5 59	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 13.4	-23 16.5	84 1.0	132 52.0	-20 23.3	184 2.3	-23 40.2
2	211 12.8	-23 16.7	114 5.9	162 51.1	-20 21.7	214 3.2	-23 40.5
4	241 12.2	-23 17.0	144 10.8	192 50.2	-20 20.1	244 4.1	-23 40.8
6	271 11.6	-23 17.2	174 15.8	222 49.2	-20 18.4	274 5.0	-23 41.1
8	301 11.0	-23 17.4	204 20.7	252 48.3	-20 16.8	304 5.9	-23 41.4
10	331 10.4	-23 17.7	234 25.6	282 47.3	-20 15.2	334 6.9	-23 41.6
12	1 9.8	-23 17.9	264 30.5	312 46.4	-20 13.5	4 7.8	-23 41.9
14	31 9.2	-23 18.2	294 35.5	342 45.5	-20 11.9	34 8.7	-23 42.2
16	61 8.6	-23 18.4	324 40.4	12 44.6	-20 10.2	64 9.6	-23 42.5
18	91 8.0	-23 18.6	354 45.3	42 43.6	-20 8.6	94 10.5	-23 42.8
20	121 7.4	-23 18.8	24 50.3	72 42.7	-20 6.9	124 11.4	-23 43.1
22	151 6.8	-23 19.1	54 55.2	102 41.8	-20 5.2	154 12.3	-23 43.4
Δ	-3	-1		-5	8	5	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	325 42.2	48	22 10.4	-103	146 53.3	-21 29.8	271 2.6	5 10.7
2	354 29.9	51	21 49.7	-106	176 57.1	-21 29.6	301 7.4	5 10.7
4	23 18.0	53	21 28.4	-109	207 .9	-21 29.4	331 12.2	5 10.6
6	52 6.7	56	21 6.6	-112	237 4.7	-21 29.2	1 17.0	5 10.6
8	80 55.9	59	20 44.3	-114	267 8.5	-21 29.0	31 21.7	5 10.5
10	109 45.7	61	20 21.5	-116	297 12.2	-21 28.8	61 26.5	5 10.5
12	138 36.0	64	19 58.2	-119	327 16.0	-21 28.6	91 31.3	5 10.5
14	167 26.8	67	19 34.5	-121	357 19.8	-21 28.4	121 36.1	5 10.4
16	196 18.2	70	19 10.2	-123	27 23.6	-21 28.2	151 40.9	5 10.4
18	225 10.1	72	18 45.6	-125	57 27.3	-21 28.0	181 45.7	5 10.4
20	254 2.5	75	18 20.6	-127	87 31.1	-21 27.8	211 50.4	5 10.3
22	282 55.5	77	17 55.1	-129	117 34.9	-21 27.7	241 55.2	5 10.3
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 58	14 53	0 57	2 46	18 39	4.4	11 20	.3
55	8 19	15 31	0 45	2 17	19 9	3.9	10 48	.7
50	7 52	15 58	0 38	1 59	19 30	3.6	10 25	1.0
45	7 32	16 19	0 34	1 47	19 47	3.3	10 7	1.3
40	7 15	16 36	0 31	1 38	20 0	3.1	9 52	1.4
35	7 1	16 50	0 28	1 31	20 12	3.0	9 40	1.6
30	6 48	17 2	0 26	1 25	20 21	2.8	9 29	1.7
20	6 27	17 23	0 24	1 19	20 39	2.6	9 10	2.0
10	6 9	17 42	0 23	1 15	20 53	2.4	8 53	2.1
0	5 52	17 59	0 23	1 15	21 7	2.2	8 37	2.3
10	5 34	18 17	0 23	1 18	21 21	2.0	8 21	2.5
20	5 15	18 35	0 25	1 24	21 35	1.8	8 4	2.7
30	4 53	18 57	0 27	1 36	21 52	1.6	7 44	2.9
35	4 40	19 10	0 30	1 47	22 2	1.5	7 33	3.1
40	4 25	19 25	0 33	2 3	22 12	1.3	7 19	3.2
45	4 8	19 43	0 37	2 33	22 25	1.1	7 3	3.4
50	3 45	20 6	0 45	: ::	22 41	.9	6 43	3.7
55	3 15	20 36	0 58	: ::	22 60	.6	6 18	4.0
60	2 31	21 20	1 44	: ::	23 26	.2	5 41	4.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	4 53.9	-1.2	16.3	$T_{\overline{m}}$ 2 23	2.4	60.8	16.6
12	4 39.4	$T_{\overline{m}_\odot}$ 11 h 55.3 min		Starost 17.3 d	Faza ❍		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 9	.2	49	-4.1	♄	14 11	.0	63	-1.8
♂	11 43	.1	100	1.3	♃	5 55	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	181 6.2	−23 19.3	85 .1	132 40.9	−20 3.6	184 13.2	−23 43.7
2	211 5.6	−23 19.5	115 5.0	162 40.0	−20 1.9	214 14.0	−23 43.9
4	241 5.0	−23 19.7	145 10.0	192 39.1	−20 .2	244 14.9	−23 44.2
6	271 4.4	−23 19.9	175 14.9	222 38.2	−19 58.5	274 15.8	−23 44.5
8	301 3.8	−23 20.1	205 19.8	252 37.3	−19 56.9	304 16.7	−23 44.8
10	331 3.2	−23 20.3	235 24.8	282 36.4	−19 55.2	334 17.6	−23 45.0
12	1 2.6	−23 20.5	265 29.7	312 35.5	−19 53.5	4 18.5	−23 45.3
14	31 2.0	−23 20.7	295 34.6	342 34.6	−19 51.8	34 19.4	−23 45.6
16	61 1.3	−23 20.9	325 39.5	12 33.7	−19 50.1	64 20.3	−23 45.9
18	91 .7	−23 21.1	355 44.5	42 32.8	−19 48.4	94 21.2	−23 46.1
20	121 .1	−23 21.3	25 49.4	72 31.9	−19 46.7	124 22.1	−23 46.4
22	150 59.5	−23 21.4	55 54.3	102 31.1	−19 45.0	154 23.0	−23 46.7
Δ	−3	−1		−4	8	4	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	311 49.0	80	17 29.3	−131	147 38.7	−21 27.5	272 .0	5 10.2
2	340 43.0	83	17 3.1	−133	177 42.4	−21 27.3	302 4.8	5 10.2
4	9 37.5	85	16 36.6	−134	207 46.2	−21 27.1	332 9.6	5 10.2
6	38 32.5	88	16 9.8	−136	237 50.0	−21 26.9	2 14.4	5 10.1
8	67 28.0	90	15 42.6	−137	267 53.8	−21 26.7	32 19.2	5 10.1
10	96 24.1	92	15 15.2	−139	297 57.5	−21 26.5	62 24.0	5 10.1
12	125 20.6	95	14 47.5	−140	328 1.3	−21 26.3	92 28.7	5 10.0
14	154 17.5	97	14 19.5	−141	358 5.1	−21 26.1	122 33.5	5 10.0
16	183 15.0	99	13 51.3	−142	28 8.8	−21 25.9	152 38.3	5 10.0
18	212 12.9	102	13 22.9	−143	58 12.6	−21 25.7	182 43.1	5 9.9
20	241 11.2	104	12 54.2	−144	88 16.4	−21 25.5	212 47.9	5 9.9
22	270 10.0	106	12 25.3	−145	118 20.2	−21 25.3	242 52.7	5 9.9
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 59	14 53	0 58	2 46	20 24	4.1	11 26	.1
55	8 20	15 32	0 45	2 18	20 42	3.7	11 6	.5
50	7 53	15 59	0 38	1 59	20 56	3.4	10 50	.8
45	7 32	16 19	0 34	1 47	21 6	3.1	10 37	1.0
40	7 16	16 36	0 31	1 38	21 15	3.0	10 27	1.2
35	7 1	16 50	0 28	1 31	21 23	2.8	10 18	1.3
30	6 49	17 3	0 26	1 25	21 29	2.7	10 10	1.5
20	6 28	17 24	0 24	1 19	21 41	2.4	9 56	1.7
10	6 9	17 42	0 23	1 15	21 51	2.2	9 44	1.9
0	5 52	17 60	0 23	1 15	21 60	2.0	9 33	2.1
10	5 35	18 17	0 23	1 18	22 9	1.8	9 21	2.3
20	5 16	18 36	0 25	1 24	22 19	1.6	9 9	2.5
30	4 54	18 58	0 27	1 37	22 30	1.4	8 54	2.8
35	4 41	19 11	0 30	1 47	22 36	1.3	8 46	2.9
40	4 26	19 26	0 33	2 3	22 44	1.1	8 36	3.1
45	4 8	19 44	0 37	2 33	22 52	.9	8 25	3.2
50	3 45	20 7	0 45	: ::	23 2	.7	8 11	3.5
55	3 15	20 36	0 58	: ::	23 14	.4	7 54	3.8
60	2 31	21 21	1 45	: ::	23 30	.1	7 30	4.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	4 25.0	−1.2	16.3	$T_{\overline{m}}$	3 20	2.2	60.0	16.3
12	4 10.4	$T_{\overline{m}_\odot}$	11 h 55.8 min	Starost 18.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 10	.2	48	−4.1	♄	14 8	.0	63	−1.8
♂	11 43	.1	99	1.3	♇	5 51	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 58.9	−23 21.6	85 59.2	132 30.2	−19 43.3	184 23.9	−23 46.9
2	210 58.3	−23 21.8	116 4.2	162 29.3	−19 41.6	214 24.8	−23 47.2
4	240 57.7	−23 22.0	146 9.1	192 28.5	−19 39.9	244 25.7	−23 47.4
6	270 57.1	−23 22.1	176 14.0	222 27.6	−19 38.2	274 26.5	−23 47.7
8	300 56.5	−23 22.3	206 19.0	252 26.7	−19 36.4	304 27.4	−23 48.0
10	330 55.8	−23 22.5	236 23.9	282 25.9	−19 34.7	334 28.3	−23 48.2
12	0 55.2	−23 22.6	266 28.8	312 25.0	−19 33.0	4 29.2	−23 48.5
14	30 54.6	−23 22.8	296 33.7	342 24.2	−19 31.3	34 30.1	−23 48.7
16	60 54.0	−23 22.9	326 38.7	12 23.3	−19 29.5	64 31.0	−23 49.0
18	90 53.4	−23 23.1	356 43.6	42 22.5	−19 27.8	94 31.9	−23 49.2
20	120 52.8	−23 23.2	26 48.5	72 21.6	−19 26.0	124 32.7	−23 49.4
22	150 52.2	−23 23.4	56 53.5	102 20.8	−19 24.3	154 33.6	−23 49.7
Δ	−3	−1		−4	9	4	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	299 9.2	108	11 56.3	−146	148 23.9	−21 25.1	272 57.5	5 9.8
2	328 8.8	110	11 27.1	−147	178 27.7	−21 24.9	303 2.3	5 9.8
4	357 8.9	112	10 57.7	−148	208 31.5	−21 24.7	333 7.1	5 9.8
6	26 9.3	114	10 28.2	−148	238 35.2	−21 24.5	3 11.9	5 9.7
8	55 10.1	116	9 58.5	−149	268 39.0	−21 24.3	33 16.7	5 9.7
10	84 11.3	118	9 28.7	−149	298 42.8	−21 24.1	63 21.5	5 9.7
12	113 12.9	120	8 58.9	−150	328 46.6	−21 23.9	93 26.3	5 9.6
14	142 14.8	121	8 28.9	−150	358 50.3	−21 23.7	123 31.1	5 9.6
16	171 17.0	123	7 58.8	−151	28 54.1	−21 23.5	153 35.9	5 9.6
18	200 19.6	125	7 28.7	−151	58 57.9	−21 23.3	183 40.7	5 9.6
20	229 22.5	126	6 58.5	−151	89 1.6	−21 23.1	213 45.5	5 9.5
22	258 25.7	128	6 28.3	−151	119 5.4	−21 22.9	243 50.3	5 9.5
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	8 59	14 53	0 58	2 46	22 2	3.8	11 29	.1
55	8 21	15 32	0 46	2 18	22 10	3.5	11 18	.4
50	7 54	15 59	0 38	1 59	22 17	3.2	11 9	.7
45	7 33	16 20	0 34	1 47	22 22	3.0	11 2	.9
40	7 16	16 36	0 31	1 38	22 26	2.8	10 56	1.0
35	7 2	16 51	0 28	1 31	22 30	2.7	10 50	1.2
30	6 50	17 3	0 26	1 26	22 33	2.5	10 46	1.3
20	6 28	17 24	0 24	1 19	22 39	2.3	10 38	1.6
10	6 10	17 43	0 23	1 15	22 44	2.1	10 30	1.8
0	5 53	18 0	0 23	1 15	22 48	1.9	10 23	2.0
10	5 35	18 18	0 23	1 18	22 53	1.7	10 16	2.1
20	5 16	18 37	0 25	1 24	22 58	1.5	10 9	2.3
30	4 54	18 59	0 27	1 37	23 3	1.3	10 0	2.6
35	4 41	19 12	0 30	1 47	23 6	1.1	9 55	2.7
40	4 26	19 27	0 33	2 3	23 10	1.0	9 50	2.9
45	4 8	19 45	0 37	2 33	23 14	.8	9 43	3.1
50	3 46	20 7	0 45	: ::	23 19	.6	9 35	3.3
55	3 16	20 37	0 58	: ::	23 25	.4	9 25	3.6
60	2 31	21 22	1 45	: ::	23 32	.1	9 12	3.9
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	3 55.8	−1.2	16.3	$T_{\overline{m}}$	4 12	2.0	59.1	16.1
12	3 41.1	$T_{\overline{m}_\odot}$	11 h 56.3 min	Starost 19.3 d		Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 10	.2	47	−4.1	♄	14 5	.0	62	−1.8
♂	11 42	.1	98	1.3	♇	5 47	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 51.6	-23 23.5	86 58.4	132 20.0	-19 22.5	184 34.5	-23 49.9
2	210 50.9	-23 23.6	117 3.3	162 19.1	-19 20.8	214 35.4	-23 50.2
4	240 50.3	-23 23.8	147 8.2	192 18.3	-19 19.0	244 36.3	-23 50.4
6	270 49.7	-23 23.9	177 13.2	222 17.5	-19 17.3	274 37.1	-23 50.6
8	300 49.1	-23 24.0	207 18.1	252 16.7	-19 15.5	304 38.0	-23 50.9
10	330 48.5	-23 24.2	237 23.0	282 15.9	-19 13.8	334 38.9	-23 51.1
12	0 47.9	-23 24.3	267 28.0	312 15.0	-19 12.0	4 39.8	-23 51.3
14	30 47.2	-23 24.4	297 32.9	342 14.2	-19 10.2	34 40.7	-23 51.6
16	60 46.6	-23 24.5	327 37.8	12 13.4	-19 8.5	64 41.5	-23 51.8
18	90 46.0	-23 24.6	357 42.7	42 12.6	-19 6.7	94 42.4	-23 52.0
20	120 45.4	-23 24.7	27 47.7	72 11.8	-19 4.9	124 43.3	-23 52.3
22	150 44.8	-23 24.8	57 52.6	102 11.0	-19 3.1	154 44.2	-23 52.5
Δ	-3	-1		-4	9	4	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	287 29.2	129	5 58.0	-152	149 9.2	-21 22.7	273 55.1	5 9.5
2	316 33.0	130	5 27.7	-152	179 12.9	-21 22.5	303 59.9	5 9.4
4	345 37.1	132	4 57.4	-152	209 16.7	-21 22.3	334 4.7	5 9.4
6	14 41.4	133	4 27.0	-152	239 20.5	-21 22.1	4 9.5	5 9.4
8	43 46.0	134	3 56.7	-152	269 24.2	-21 21.9	34 14.3	5 9.4
10	72 50.8	135	3 26.4	-151	299 28.0	-21 21.7	64 19.1	5 9.3
12	101 55.9	136	2 56.1	-151	329 31.7	-21 21.5	94 23.9	5 9.3
14	131 1.2	137	2 25.8	-151	359 35.5	-21 21.3	124 28.7	5 9.3
16	160 6.6	138	1 55.6	-151	29 39.3	-21 21.1	154 33.5	5 9.2
18	189 12.3	139	1 25.4	-151	59 43.0	-21 20.9	184 38.3	5 9.2
20	218 18.2	140	0 55.3	-150	89 46.8	-21 20.7	214 43.1	5 9.2
22	247 24.2	141	0 25.2	-150	119 50.6	-21 20.5	244 48.0	5 9.2
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 0	14 53	0 58	2 46	23 33	3.7	11 32	.1
55	8 21	15 32	0 46	2 18	23 34	3.3	11 28	.4
50	7 54	15 59	0 39	1 60	23 34	3.1	11 25	.6
45	7 34	16 20	0 34	1 47	23 34	2.9	11 23	.8
40	7 17	16 37	0 31	1 38	23 34	2.7	11 21	1.0
35	7 3	16 51	0 28	1 31	23 34	2.6	11 19	1.1
30	6 50	17 3	0 26	1 26	23 34	2.4	11 18	1.2
20	6 29	17 25	0 24	1 19	23 34	2.2	11 15	1.5
10	6 10	17 43	0 23	1 15	23 34	2.0	11 12	1.7
0	5 53	18 1	0 23	1 15	23 34	1.8	11 10	1.9
10	5 35	18 18	0 23	1 18	23 34	1.6	11 8	2.0
20	5 17	18 37	0 25	1 24	23 34	1.4	11 5	2.2
30	4 54	18 59	0 27	1 37	23 34	1.2	11 3	2.5
35	4 41	19 12	0 30	1 47	23 34	1.1	11 1	2.6
40	4 26	19 27	0 33	2 3	23 34	1.0	10 59	2.8
45	4 8	19 45	0 37	2 33	23 34	.8	10 57	2.9
50	3 46	20 8	0 45	: ::	23 34	.6	10 54	3.1
55	3 16	20 38	0 58	: ::	23 34	.4	10 51	3.4
60	2 31	21 23	1 46	: ::	23 34	.1	10 46	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	3 26.4	-1.2	16.3	$T_{\overline{m}}$ 4 59	1.9	58.1	15.8
12	3 11.6	$T_{\overline{m}_\odot}$ 11 h 56.8 min		Starost 20.3 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 11	.2	45	-4.1	♃	14 2	.0	62	-1.8
♂	11 41	.1	98	1.3	♄	5 43	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 44.2	-23 24.9	87 57.5	132 10.2	-19 1.3	184 45.0	-23 52.7
2	210 43.5	-23 25.0	118 2.5	162 9.4	-18 59.5	214 45.9	-23 52.9
4	240 42.9	-23 25.1	148 7.4	192 8.7	-18 57.8	244 46.8	-23 53.1
6	270 42.3	-23 25.2	178 12.3	222 7.9	-18 56.0	274 47.7	-23 53.4
8	300 41.7	-23 25.3	208 17.2	252 7.1	-18 54.2	304 48.5	-23 53.6
10	330 41.1	-23 25.4	238 22.2	282 6.3	-18 52.4	334 49.4	-23 53.8
12	0 40.5	-23 25.5	268 27.1	312 5.5	-18 50.6	4 50.3	-23 54.0
14	30 39.8	-23 25.5	298 32.0	342 4.8	-18 48.7	34 51.1	-23 54.2
16	60 39.2	-23 25.6	328 37.0	12 4.0	-18 46.9	64 52.0	-23 54.4
18	90 38.6	-23 25.7	358 41.9	42 3.2	-18 45.1	94 52.9	-23 54.6
20	120 38.0	-23 25.7	28 46.8	72 2.5	-18 43.3	124 53.8	-23 54.8
22	150 37.4	-23 25.8	58 51.7	102 1.7	-18 41.5	154 54.6	-23 55.0
Δ	-3	0		-4	9	4	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_{5}	δ_{5}
h	° ′		° ′		° ′	° ′	° ′	° ′
0	276 30.4	142	- 0 4.8	-150	149 54.3	-21 20.3	274 52.8	5 9.1
2	305 36.8	142	- 0 34.7	-149	179 58.1	-21 20.1	304 57.6	5 9.1
4	334 43.2	143	- 1 4.5	-149	210 1.9	-21 19.9	335 2.4	5 9.1
6	3 49.9	144	- 1 34.2	-148	240 5.6	-21 19.7	5 7.2	5 9.1
8	32 56.6	144	- 2 3.9	-148	270 9.4	-21 19.5	35 12.0	5 9.0
10	62 3.5	145	- 2 33.4	-147	300 13.1	-21 19.3	65 16.8	5 9.0
12	91 10.4	145	- 3 2.8	-146	330 16.9	-21 19.1	95 21.6	5 9.0
14	120 17.5	146	- 3 32.1	-146	0 20.7	-21 18.9	125 26.5	5 9.0
16	149 24.6	146	- 4 1.2	-145	30 24.4	-21 18.7	155 31.3	5 8.9
18	178 31.8	146	- 4 30.2	-144	60 28.2	-21 18.5	185 36.1	5 8.9
20	207 39.0	147	- 4 59.1	-144	90 31.9	-21 18.3	215 40.9	5 8.9
22	236 46.3	147	- 5 27.8	-143	120 35.7	-21 18.1	245 45.7	5 8.9
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 1	14 54	0 58	2 46	. . . .	.0	11 33	.1
55	8 22	15 32	0 46	2 18	. . . .	.0	11 37	.4
50	7 55	15 60	0 39	1 60	. . . .	.0	11 40	.6
45	7 34	16 20	0 34	1 47	. . . .	.0	11 42	.8
40	7 17	16 37	0 31	1 38	. . . .	.0	11 44	1.0
35	7 3	16 51	0 28	1 31	. . . .	.0	11 46	1.1
30	6 51	17 4	0 26	1 26	. . . .	.0	11 47	1.2
20	6 30	17 25	0 24	1 19	. . . .	.0	11 50	1.4
10	6 11	17 44	0 23	1 15	. . . .	.0	11 52	1.6
0	5 54	18 1	0 23	1 15	. . . .	.0	11 55	1.8
10	5 36	18 19	0 23	1 18	. . . .	.0	11 57	2.0
20	5 17	18 38	0 25	1 24	. . . .	.0	11 59	2.2
30	4 55	18 60	0 27	1 37	. . . .	.0	12 2	2.4
35	4 42	19 13	0 30	1 47	. . . .	.0	12 3	2.5
40	4 27	19 28	0 33	2 3	23 57	1.0	12 5	2.7
45	4 9	19 46	0 37	2 33	23 53	.8	12 7	2.8
50	3 46	20 9	0 45	: ::	23 48	.6	12 10	3.1
55	3 16	20 39	0 58	: ::	23 43	.4	12 13	3.3
60	2 31	21 23	1 47	: ::	23 35	.1	12 16	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	2 56.8	-1.2	16.3	$T_{\overline{m}}$ 5 44	1.8	57.2	15.6
12	2 42.0	$T_{\overline{m}_\odot}$ 11 h 57.3 min		Starost 21.3 d	Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 12	.2	44	-4.1	♃	13 59	.0	62	-1.8
♂	11 41	.1	97	1.3	♄	5 40	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 36.7	-23 25.9	88 56.7	132 1.0	-18 39.7	184 55.5	-23 55.2
2	210 36.1	-23 25.9	119 1.6	162 .2	-18 37.8	214 56.4	-23 55.4
4	240 35.5	-23 26.0	149 6.5	191 59.5	-18 36.0	244 57.2	-23 55.6
6	270 34.9	-23 26.0	179 11.4	221 58.7	-18 34.2	274 58.1	-23 55.8
8	300 34.3	-23 26.1	209 16.4	251 58.0	-18 32.3	304 59.0	-23 56.0
10	330 33.6	-23 26.1	239 21.3	281 57.3	-18 30.5	334 59.8	-23 56.2
12	0 33.0	-23 26.2	269 26.2	311 56.5	-18 28.7	5 .7	-23 56.4
14	30 32.4	-23 26.2	299 31.2	341 55.8	-18 26.8	35 1.5	-23 56.6
16	60 31.8	-23 26.2	329 36.1	11 55.1	-18 25.0	65 2.4	-23 56.8
18	90 31.1	-23 26.3	359 41.0	41 54.3	-18 23.1	95 3.3	-23 56.9
20	120 30.5	-23 26.3	29 45.9	71 53.6	-18 21.3	125 4.1	-23 57.1
22	150 29.9	-23 26.3	59 50.9	101 52.9	-18 19.4	155 5.0	-23 57.3
Δ	-3	0		-4	9	4	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	265 53.7	147 - 5	56.3	-142	150 39.5	-21 17.9	275 50.5	5 8.9
2	295 1.1	147 - 6	24.7	-141	180 43.2	-21 17.7	305 55.4	5 8.8
4	324 8.5	147 - 6	52.9	-140	210 47.0	-21 17.5	336 .2	5 8.8
6	353 15.9	147 - 7	21.0	-139	240 50.7	-21 17.3	6 5.0	5 8.8
8	22 23.3	147 - 7	48.8	-138	270 54.5	-21 17.1	36 9.8	5 8.8
10	51 30.7	147 - 8	16.5	-137	300 58.2	-21 16.9	66 14.7	5 8.8
12	80 38.1	147 - 8	44.0	-136	331 2.0	-21 16.7	96 19.5	5 8.7
14	109 45.5	147 - 9	11.2	-135	1 5.8	-21 16.5	126 24.3	5 8.7
16	138 52.9	147 - 9	38.3	-134	31 9.5	-21 16.3	156 29.1	5 8.7
18	168 .2	146 -10	5.1	-133	61 13.3	-21 16.1	186 33.9	5 8.7
20	197 7.5	146 -10	31.8	-132	91 17.0	-21 15.9	216 38.8	5 8.7
22	226 14.7	146 -10	58.2	-131	121 20.8	-21 15.7	246 43.6	5 8.6
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	14 54	0 58	2 46	1 3	3.6	11 35	.1
55	8 23	15 33	0 46	2 18	0 55	3.3	11 46	.4
50	7 56	16 0	0 39	1 60	0 48	3.0	11 54	.7
45	7 35	16 21	0 34	1 47	0 43	2.8	12 1	.9
40	7 18	16 38	0 31	1 38	0 39	2.7	12 7	1.0
35	7 4	16 52	0 28	1 31	0 35	2.5	12 12	1.1
30	6 51	17 4	0 26	1 26	0 32	2.4	12 17	1.3
20	6 30	17 26	0 24	1 19	0 27	2.2	12 25	1.5
10	6 12	17 44	0 23	1 15	0 22	2.0	12 32	1.7
0	5 54	18 2	0 23	1 15	0 17	1.8	12 38	1.8
10	5 36	18 19	0 23	1 18	0 13	1.6	12 45	2.0
20	5 17	18 38	0 25	1 24	0 8	1.4	12 52	2.2
30	4 55	19 0	0 27	1 37	0 3	1.2	12 60	2.4
35	4 42	19 13	0 30	1 47	0 0	1.1	13 4	2.5
40	4 27	19 28	0 33	2 3	. . . .	.0	13 9	2.6
45	4 9	19 46	0 37	2 33	. . . .	.0	13 15	2.8
50	3 47	20 9	0 45	: ::	. . . .	.0	13 23	3.0
55	3 16	20 39	0 58	: ::	23 52	.5	13 32	3.3
60	2 32	21 24	1 47	: ::	23 37	.1	13 44	3.6
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	2 27.1	-1.2	16.3	$T_{\overline{m}}$	6 28	1.8	56.4	15.4
12	2 12.2	$T_{\overline{m}_\odot}$	11 h 57.8 min	Starost 22.3 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 12	.2	43	-4.1	♃	13 56	.0	62	-1.8
♂	11 40	.1	96	1.3	♄	5 36	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 29.3	-23 26.3	89 55.8	131 52.2	-18 17.6	185 5.9	-23 57.5
2	210 28.7	-23 26.4	120 .7	161 51.5	-18 15.7	215 6.7	-23 57.7
4	240 28.0	-23 26.4	150 5.7	191 50.8	-18 13.8	245 7.6	-23 57.8
6	270 27.4	-23 26.4	180 10.6	221 50.1	-18 12.0	275 8.4	-23 58.0
8	300 26.8	-23 26.4	210 15.5	251 49.4	-18 10.1	305 9.3	-23 58.2
10	330 26.2	-23 26.4	240 20.4	281 48.7	-18 8.2	335 10.2	-23 58.4
12	0 25.5	-23 26.4	270 25.4	311 48.0	-18 6.3	5 11.0	-23 58.5
14	30 24.9	-23 26.4	300 30.3	341 47.3	-18 4.5	35 11.9	-23 58.7
16	60 24.3	-23 26.4	330 35.2	11 46.6	-18 2.6	65 12.7	-23 58.9
18	90 23.7	-23 26.4	0 40.2	41 45.9	-18 .7	95 13.6	-23 59.0
20	120 23.1	-23 26.4	30 45.1	71 45.2	-17 58.8	125 14.4	-23 59.2
22	150 22.4	-23 26.4	60 50.0	101 44.6	-17 56.9	155 15.3	-23 59.3
Δ	-3	0		-3	9	4	-1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	255 21.8	145 -11	24.4	-130	151 24.5	-21 15.4	276 48.4	5 8.6
2	284 28.9	145 -11	50.3	-128	181 28.3	-21 15.2	306 53.3	5 8.6
4	313 35.9	145 -12	16.0	-127	211 32.0	-21 15.0	336 58.1	5 8.6
6	342 42.9	144 -12	41.4	-126	241 35.8	-21 14.8	7 2.9	5 8.6
8	11 49.7	144 -13	6.6	-125	271 39.5	-21 14.6	37 7.7	5 8.5
10	40 56.4	143 -13	31.5	-123	301 43.3	-21 14.4	67 12.6	5 8.5
12	70 3.1	143 -13	56.2	-122	331 47.1	-21 14.2	97 17.4	5 8.5
14	99 9.6	142 -14	20.6	-121	1 50.8	-21 14.0	127 22.2	5 8.5
16	128 16.0	141 -14	44.7	-119	31 54.6	-21 13.8	157 27.1	5 8.5
18	157 22.3	141 -15	8.5	-118	61 58.3	-21 13.6	187 31.9	5 8.5
20	186 28.5	140 -15	32.0	-116	92 2.1	-21 13.4	217 36.7	5 8.5
22	215 34.5	139 -15	55.3	-115	122 5.8	-21 13.2	247 41.6	5 8.4
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 2	14 54	0 58	2 46	2 30	3.7	11 37	.1
55	8 23	15 33	0 46	2 18	2 14	3.3	11 56	.5
50	7 56	16 0	0 39	1 60	2 1	3.0	12 10	.8
45	7 35	16 21	0 34	1 47	1 51	2.8	12 22	1.0
40	7 18	16 38	0 31	1 38	1 43	2.6	12 32	1.1
35	7 4	16 52	0 28	1 31	1 35	2.5	12 40	1.2
30	6 52	17 5	0 26	1 26	1 29	2.4	12 47	1.4
20	6 31	17 26	0 24	1 19	1 19	2.2	13 0	1.6
10	6 12	17 45	0 23	1 15	1 9	2.0	13 11	1.7
0	5 55	18 2	0 23	1 15	1 1	1.8	13 22	1.9
10	5 37	18 20	0 23	1 18	0 52	1.7	13 32	2.0
20	5 18	18 39	0 25	1 24	0 43	1.5	13 44	2.2
30	4 56	19 1	0 27	1 37	0 33	1.3	13 57	2.4
35	4 43	19 14	0 30	1 47	0 27	1.2	14 4	2.5
40	4 28	19 29	0 33	2 3	0 21	1.1	14 13	2.6
45	4 10	19 47	0 37	2 33	0 13	.9	14 23	2.8
50	3 47	20 10	0 45	: ::	0 4	.7	14 35	3.0
55	3 17	20 40	0 58	: ::	. . . .	.0	14 51	3.3
60	2 32	21 25	1 47	: ::	23 40	.2	15 11	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$	h min	min	′	′
00	1 57.3	-1.2	16.3	$T_{\overline{m}}$	7 11	1.9	55.7	15.2
12	1 42.3	$T_{\overline{m}_\odot}$	11 h 58.3 min	Starost 23.3 d		Faza ◑		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 13	.2	42	-4.1	♃	13 53	.0	61	-1.8
♂	11 39	.1	95	1.3	♄	5 32	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 21.8	−23 26.3	90 54.9	131 43.9	−17 55.0	185 16.1	−23 59.5
2	210 21.2	−23 26.3	120 59.9	161 43.2	−17 53.1	215 17.0	−23 59.7
4	240 20.6	−23 26.3	151 4.8	191 42.6	−17 51.2	245 17.8	−23 59.8
6	270 19.9	−23 26.3	181 9.7	221 41.9	−17 49.3	275 18.7	−23 60.0
8	300 19.3	−23 26.2	211 14.7	251 41.2	−17 47.4	305 19.6	−24 .1
10	330 18.7	−23 26.2	241 19.6	281 40.6	−17 45.5	335 20.4	−24 .3
12	0 18.1	−23 26.2	271 24.5	311 39.9	−17 43.6	5 21.3	−24 .4
14	30 17.4	−23 26.1	301 29.4	341 39.3	−17 41.7	35 22.1	−24 .6
16	60 16.8	−23 26.1	331 34.4	11 38.6	−17 39.8	65 23.0	−24 .7
18	90 16.2	−23 26.0	1 39.3	41 38.0	−17 37.8	95 23.8	−24 .8
20	120 15.6	−23 26.0	31 44.2	71 37.4	−17 35.9	125 24.7	−24 1.0
22	150 14.9	−23 25.9	61 49.2	101 36.7	−17 34.0	155 25.5	−24 1.1
Δ	−3	0		−3	10	4	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	244 40.4	139	−16 18.2	−113	152 9.6	−21 13.0	277 46.4	5 8.4
2	273 46.1	138	−16 40.8	−112	182 13.3	−21 12.7	307 51.2	5 8.4
4	302 51.7	137	−17 3.2	−110	212 17.1	−21 12.5	337 56.1	5 8.4
6	331 57.1	136	−17 25.2	−108	242 20.8	−21 12.3	8 .9	5 8.4
8	1 2.4	136	−17 46.8	−107	272 24.6	−21 12.1	38 5.8	5 8.4
10	30 7.5	135	−18 8.2	−105	302 28.3	−21 11.9	68 10.6	5 8.4
12	59 12.5	134	−18 29.2	−103	332 32.1	−21 11.7	98 15.4	5 8.3
14	88 17.2	133	−18 49.8	−102	2 35.8	−21 11.5	128 20.3	5 8.3
16	117 21.8	132	−19 10.2	−100	32 39.6	−21 11.3	158 25.1	5 8.3
18	146 26.3	131	−19 30.1	−98	62 43.3	−21 11.1	188 30.0	5 8.3
20	175 30.5	130	−19 49.7	−96	92 47.1	−21 10.9	218 34.8	5 8.3
22	204 34.6	129	−20 9.0	−94	122 50.8	−21 10.7	248 39.6	5 8.3
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 55	0 58	2 46	3 58	3.7	11 41	.3
55	8 24	15 34	0 46	2 18	3 32	3.3	12 8	.7
50	7 57	16 1	0 39	1 60	3 13	3.0	12 29	1.0
45	7 36	16 22	0 34	1 47	2 58	2.8	12 45	1.1
40	7 19	16 39	0 31	1 38	2 46	2.6	12 59	1.3
35	7 5	16 53	0 28	1 31	2 35	2.5	13 10	1.4
30	6 52	17 5	0 26	1 26	2 26	2.4	13 20	1.5
20	6 31	17 27	0 24	1 19	2 11	2.2	13 37	1.7
10	6 13	17 45	0 23	1 15	1 57	2.0	13 52	1.8
0	5 55	18 3	0 23	1 15	1 45	1.9	14 7	1.9
10	5 37	18 20	0 23	1 18	1 32	1.8	14 21	2.1
20	5 18	18 39	0 25	1 24	1 19	1.6	14 36	2.2
30	4 56	19 1	0 27	1 37	1 4	1.4	14 54	2.4
35	4 43	19 14	0 30	1 47	0 56	1.3	15 4	2.5
40	4 28	19 29	0 33	2 3	0 46	1.2	15 16	2.6
45	4 10	19 47	0 37	2 33	0 35	1.0	15 30	2.7
50	3 48	20 10	0 45	: ::	0 21	.9	15 47	2.9
55	3 17	20 40	0 58	: ::	0 4	.6	16 9	3.2
60	2 33	21 25	1 47	: ::	23 45	.4	16 40	3.7
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	1 27.4	−1.2	16.3	7 56	1.9	55.1	15.0
12	1 12.4	$T_{\overline{m}_\odot}$ 11 h 58.8 min		Starost 24.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 13	.2	41	−4.1	♄	13 50	.0	61	−1.8
♂	11 39	.1	94	1.3	♃	5 28	.0	187	1.0

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 14.3	−23 25.9	91 54.1	131 36.1	−17 32.1	185 26.4	−24 1.3
2	210 13.7	−23 25.8	121 59.0	161 35.5	−17 30.1	215 27.2	−24 1.4
4	240 13.1	−23 25.7	152 3.9	191 34.8	−17 28.2	245 28.0	−24 1.5
6	270 12.5	−23 25.7	182 8.9	221 34.2	−17 26.3	275 28.9	−24 1.7
8	300 11.8	−23 25.6	212 13.8	251 33.6	−17 24.3	305 29.7	−24 1.8
10	330 11.2	−23 25.5	242 18.7	281 33.0	−17 22.4	335 30.6	−24 1.9
12	0 10.6	−23 25.5	272 23.7	311 32.4	−17 20.4	5 31.4	−24 2.0
14	30 10.0	−23 25.4	302 28.6	341 31.8	−17 18.5	35 32.3	−24 2.2
16	60 9.3	−23 25.3	332 33.5	11 31.2	−17 16.5	65 33.1	−24 2.3
18	90 8.7	−23 25.2	2 38.4	41 30.6	−17 14.6	95 34.0	−24 2.4
20	120 8.1	−23 25.1	32 43.4	71 30.0	−17 12.6	125 34.8	−24 2.5
22	150 7.5	−23 25.0	62 48.3	101 29.4	−17 10.7	155 35.6	−24 2.6
Δ	−3	0		−3	10	4	−1

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\mathrm{♃}}$	$\delta_{\mathrm{♃}}$	$S_{\mathrm{♄}}$	$\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	233 38.5	128	−20 27.9	−92	152 54.6	−21 10.4	278 44.5	5 8.3
2	262 42.2	128	−20 46.3	−91	182 58.3	−21 10.2	308 49.3	5 8.3
4	291 45.7	127	−21 4.5	−89	213 2.1	−21 10.0	338 54.2	5 8.2
6	320 49.0	126	−21 22.2	−87	243 5.8	−21 9.8	8 59.0	5 8.2
8	349 52.1	125	−21 39.5	−85	273 9.5	−21 9.6	39 3.9	5 8.2
10	18 55.0	124	−21 56.5	−83	303 13.3	−21 9.4	69 8.7	5 8.2
12	47 57.8	123	−22 13.0	−81	333 17.0	−21 9.2	99 13.6	5 8.2
14	77 .4	122	−22 29.1	−79	3 20.8	−21 9.0	129 18.4	5 8.2
16	106 2.7	121	−22 44.8	−76	33 24.5	−21 8.7	159 23.3	5 8.2
18	135 4.9	120	−23 .1	−74	63 28.3	−21 8.5	189 28.1	5 8.2
20	164 6.9	119	−23 15.0	−72	93 32.0	−21 8.3	219 33.0	5 8.2
22	193 8.7	118	−23 29.4	−70	123 35.8	−21 8.1	249 37.8	5 8.2
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 56	0 58	2 46	5 27	3.6	11 47	.5
55	8 24	15 34	0 46	2 18	4 50	3.1	12 25	1.0
50	7 57	16 2	0 39	1 60	4 24	2.9	12 52	1.2
45	7 36	16 22	0 34	1 47	4 5	2.7	13 13	1.4
40	7 19	16 39	0 31	1 38	3 49	2.6	13 29	1.5
35	7 5	16 53	0 28	1 31	3 35	2.5	13 44	1.6
30	6 53	17 6	0 26	1 26	3 23	2.4	13 56	1.7
20	6 32	17 27	0 24	1 19	3 4	2.2	14 17	1.8
10	6 13	17 46	0 23	1 15	2 47	2.1	14 36	1.9
0	5 56	18 3	0 23	1 15	2 31	2.0	14 53	2.0
10	5 38	18 21	0 23	1 18	2 15	1.9	15 11	2.1
20	5 19	18 40	0 25	1 24	1 58	1.7	15 29	2.2
30	4 57	19 2	0 27	1 37	1 39	1.6	15 51	2.4
35	4 44	19 15	0 30	1 47	1 27	1.5	16 4	2.4
40	4 29	19 30	0 33	2 3	1 15	1.4	16 18	2.5
45	4 11	19 48	0 37	2 33	0 60	1.3	16 36	2.6
50	3 48	20 10	0 45	: ::	0 41	1.1	16 58	2.8
55	3 18	20 40	0 58	: ::	0 18	.8	17 26	3.0
60	2 33	21 25	1 46	: ::	23 54	.7	18 8	3.5
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	$T_{\overline{m}}$ h min	min	′	′
00	0 57.5	−1.2	16.3	8 42	2.0	54.6	14.9
12	0 42.5	$T_{\overline{m}_\odot}$ 11 h 59.3 min		Starost 25.3 d	Faza ◑		

PLANETE

Pl.	$T_{\overline{m}}$	π	360 − α	Vel.	Pl.	$T_{\overline{m}}$	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 14	.2	40	−4.2	♄	13 47	.0	61	−1.8
♂	11 38	.1	94	1.3	♃	5 24	.0	187	1.0

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	180 6.8	-23 24.9	92 53.2	131 28.8	-17 8.7	185 36.5	-24 2.8
2	210 6.2	-23 24.8	122 58.1	161 28.2	-17 6.7	215 37.3	-24 2.9
4	240 5.6	-23 24.7	153 3.1	191 27.6	-17 4.8	245 38.2	-24 3.0
6	270 5.0	-23 24.6	183 8.0	221 27.0	-17 2.8	275 39.0	-24 3.1
8	300 4.3	-23 24.5	213 12.9	251 26.5	-17 .8	305 39.8	-24 3.2
10	330 3.7	-23 24.4	243 17.9	281 25.9	-16 58.9	335 40.7	-24 3.3
12	0 3.1	-23 24.3	273 22.8	311 25.3	-16 56.9	5 41.5	-24 3.4
14	30 2.5	-23 24.2	303 27.7	341 24.8	-16 54.9	35 42.4	-24 3.5
16	60 1.9	-23 24.0	333 32.6	11 24.2	-16 52.9	65 43.2	-24 3.6
18	90 1.2	-23 23.9	3 37.6	41 23.6	-16 50.9	95 44.0	-24 3.7
20	120 .6	-23 23.8	33 42.5	71 23.1	-16 49.0	125 44.9	-24 3.8
22	150 .0	-23 23.6	63 47.4	101 22.5	-16 47.0	155 45.7	-24 3.9
Δ	-3	1		-3	10	4	-1

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\sun}$	JUPITER $\delta_{\sun}$	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	222 10.3	117	-23 43.4	-68	153 39.5	-21 7.9	279 42.7	5 8.2
2	251 11.8	116	-23 57.0	-66	183 43.2	-21 7.7	309 47.5	5 8.2
4	280 13.0	115	-24 10.1	-63	213 47.0	-21 7.5	339 52.4	5 8.1
6	309 14.1	115	-24 22.7	-61	243 50.7	-21 7.3	9 57.2	5 8.1
8	338 15.0	114	-24 34.9	-59	273 54.5	-21 7.0	40 2.1	5 8.1
10	7 15.7	113	-24 46.7	-56	303 58.2	-21 6.8	70 7.0	5 8.1
12	36 16.3	112	-24 58.0	-54	334 2.0	-21 6.6	100 11.8	5 8.1
14	65 16.7	111	-25 8.8	-52	4 5.7	-21 6.4	130 16.7	5 8.1
16	94 17.0	111	-25 19.1	-49	34 9.4	-21 6.2	160 21.5	5 8.1
18	123 17.1	110	-25 29.0	-47	64 13.2	-21 6.0	190 26.4	5 8.1
20	152 17.1	109	-25 38.4	-45	94 16.9	-21 5.8	220 31.2	5 8.1
22	181 16.9	108	-25 47.3	-42	124 20.7	-21 5.5	250 36.1	5 8.1
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	14 56	0 58	2 46	6 54	3.3	11 59	1.0
55	8 25	15 35	0 46	2 18	6 6	2.9	12 48	1.4
50	7 57	16 2	0 39	1 60	5 33	2.7	13 21	1.6
45	7 37	16 23	0 34	1 47	5 9	2.5	13 46	1.7
40	7 20	16 40	0 31	1 38	4 50	2.5	14 6	1.8
35	7 6	16 54	0 28	1 31	4 34	2.4	14 22	1.8
30	6 53	17 6	0 26	1 26	4 20	2.3	14 37	1.9
20	6 32	17 28	0 24	1 19	3 57	2.2	15 1	2.0
10	6 13	17 46	0 23	1 15	3 37	2.1	15 22	2.0
0	5 56	18 4	0 23	1 15	3 18	2.1	15 42	2.1
10	5 38	18 21	0 23	1 18	2 60	2.0	16 2	2.1
20	5 19	18 40	0 25	1 24	2 40	1.9	16 23	2.2
30	4 57	19 2	0 27	1 37	2 17	1.8	16 48	2.3
35	4 44	19 15	0 30	1 47	2 3	1.7	17 2	2.3
40	4 29	19 30	0 33	2 3	1 48	1.6	17 19	2.4
45	4 11	19 48	0 37	2 33	1 30	1.5	17 39	2.4
50	3 49	20 11	0 45	: ::	1 7	1.4	18 5	2.5
55	3 19	20 41	0 58	: ::	0 37	1.2	18 39	2.7
60	2 34	21 25	1 45	: ::	.. ..	.0	19 33	3.0
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	0 27.5	-1.2	16.3	$T_{\overline{m}}$ 9 30	2.1	54.3	14.8
12	0 12.6	$T_{\overline{m}_\odot}$ 11 h 59.8 min		Starost 26.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 14	.2	39	-4.2	♃	13 44	.0	61	-1.8
♂	11 37	.1	93	1.3	♄	5 20	.0	187	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 59.4	-23 23.5	93 52.4	131 22.0	-16 45.0	185 46.6	-24 4.0
2	209 58.7	-23 23.4	123 57.3	161 21.4	-16 43.0	215 47.4	-24 4.1
4	239 58.1	-23 23.2	154 2.2	191 20.9	-16 41.0	245 48.2	-24 4.2
6	269 57.5	-23 23.1	184 7.1	221 20.3	-16 39.0	275 49.1	-24 4.3
8	299 56.9	-23 22.9	214 12.1	251 19.8	-16 37.0	305 49.9	-24 4.4
10	329 56.3	-23 22.8	244 17.0	281 19.3	-16 35.0	335 50.7	-24 4.5
12	359 55.6	-23 22.6	274 21.9	311 18.8	-16 33.0	5 51.6	-24 4.5
14	29 55.0	-23 22.5	304 26.9	341 18.2	-16 30.9	35 52.4	-24 4.6
16	59 54.4	-23 22.3	334 31.8	11 17.7	-16 28.9	65 53.2	-24 4.7
18	89 53.8	-23 22.1	4 36.7	41 17.2	-16 26.9	95 54.1	-24 4.8
20	119 53.2	-23 22.0	34 41.6	71 16.7	-16 24.9	125 54.9	-24 4.9
22	149 52.5	-23 21.8	64 46.6	101 16.2	-16 22.9	155 55.7	-24 4.9
Δ	-3	1		-3	10	4	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\sun}$	JUPITER $\delta_{\sun}$	SATURN S_η	SATURN δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	210 16.6	108	-25 55.7	-40	154 24.4	-21 5.3	280 41.0	5 8.1
2	239 16.1	107	-26 3.6	-37	184 28.2	-21 5.1	310 45.8	5 8.1
4	268 15.5	107	-26 11.0	-35	214 31.9	-21 4.9	340 50.7	5 8.1
6	297 14.9	106	-26 17.9	-32	244 35.6	-21 4.7	10 55.6	5 8.1
8	326 14.1	106	-26 24.3	-30	274 39.4	-21 4.5	41 .4	5 8.1
10	355 13.2	105	-26 30.3	-27	304 43.1	-21 4.2	71 5.3	5 8.1
12	24 12.2	105	-26 35.7	-25	334 46.9	-21 4.0	101 10.1	5 8.1
14	53 11.1	104	-26 40.6	-22	4 50.6	-21 3.8	131 15.0	5 8.1
16	82 10.0	104	-26 45.0	-19	34 54.3	-21 3.6	161 19.9	5 8.1
18	111 8.8	104	-26 48.9	-17	64 58.1	-21 3.4	191 24.7	5 8.1
20	140 7.5	103	-26 52.2	-14	95 1.8	-21 3.2	221 29.6	5 8.1
22	169 6.2	103	-26 55.1	-12	125 5.5	-21 2.9	251 34.5	5 8.1
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 57	0 58	2 46	8 15	2.6	12 22	1.8
55	8 25	15 36	0 46	2 18	7 15	2.4	13 22	2.0
50	7 58	16 3	0 38	1 60	6 38	2.3	13 59	2.0
45	7 37	16 24	0 34	1 47	6 11	2.3	14 27	2.0
40	7 20	16 40	0 31	1 38	5 49	2.3	14 48	2.1
35	7 6	16 55	0 28	1 31	5 31	2.2	15 6	2.1
30	6 54	17 7	0 26	1 26	5 16	2.2	15 22	2.1
20	6 32	17 28	0 24	1 19	4 50	2.2	15 48	2.1
10	6 14	17 47	0 23	1 15	4 28	2.1	16 11	2.1
0	5 57	18 4	0 23	1 15	4 8	2.1	16 32	2.1
10	5 39	18 22	0 23	1 18	3 47	2.1	16 53	2.1
20	5 20	18 41	0 25	1 24	3 25	2.0	17 16	2.1
30	4 58	19 3	0 27	1 37	2 60	2.0	17 42	2.1
35	4 45	19 16	0 30	1 47	2 45	2.0	17 58	2.1
40	4 30	19 31	0 33	2 3	2 27	1.9	18 16	2.1
45	4 12	19 49	0 37	2 33	2 7	1.9	18 38	2.1
50	3 49	20 11	0 45	: ::	1 41	1.8	19 5	2.1
55	3 19	20 41	0 58	: ::	1 6	1.7	19 43	2.1
60	2 35	21 26	1 45	: ::	0 11	1.3	20 45	2.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 0 2.4	-1.2	16.3	$T_{\overline{m}}$ 10 20	2.1	54.1	14.7
12	- 0 17.3	$T_{\overline{m}_\odot}$ 12 h .3 min		Starost 27.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 15	.2	37	-4.2	♃	13 41	.0	61	-1.8
♂	11 37	.1	92	1.3	♄	5 16	.0	187	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 51.9	-23 21.6	94 51.5	131 15.7	-16 20.9	185 56.6	-24 5.0
2	209 51.3	-23 21.4	124 56.4	161 15.2	-16 18.8	215 57.4	-24 5.1
4	239 50.7	-23 21.3	155 1.4	191 14.7	-16 16.8	245 58.2	-24 5.2
6	269 50.1	-23 21.1	185 6.3	221 14.2	-16 14.8	275 59.0	-24 5.2
8	299 49.4	-23 20.9	215 11.2	251 13.7	-16 12.7	305 59.9	-24 5.3
10	329 48.8	-23 20.7	245 16.1	281 13.2	-16 10.7	336 .7	-24 5.3
12	359 48.2	-23 20.5	275 21.1	311 12.7	-16 8.7	6 1.5	-24 5.4
14	29 47.6	-23 20.3	305 26.0	341 12.2	-16 6.6	36 2.4	-24 5.5
16	59 47.0	-23 20.1	335 30.9	11 11.7	-16 4.6	66 3.2	-24 5.5
18	89 46.3	-23 19.9	5 35.9	41 11.2	-16 2.5	96 4.0	-24 5.6
20	119 45.7	-23 19.7	35 40.8	71 10.8	-16 .5	126 4.8	-24 5.6
22	149 45.1	-23 19.5	65 45.7	101 10.3	-15 58.4	156 5.7	-24 5.7
Δ	-3	1		-2	10	4	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	198 4.8	103	-26 57.4	-9	155 9.3	-21 2.7	281 39.4	5 8.1
2	227 3.4	103	-26 59.2	-7	185 13.0	-21 2.5	311 44.2	5 8.1
4	256 2.0	103	-27 .5	-4	215 16.8	-21 2.3	341 49.1	5 8.1
6	285 .6	103	-27 1.3	-1	245 20.5	-21 2.1	11 54.0	5 8.1
8	313 59.1	103	-27 1.5	1	275 24.2	-21 1.9	41 58.8	5 8.1
10	342 57.7	103	-27 1.3	4	305 28.0	-21 1.6	72 3.7	5 8.1
12	11 56.2	103	-27 .5	6	335 31.7	-21 1.4	102 8.6	5 8.1
14	40 54.8	103	-26 59.2	9	5 35.4	-21 1.2	132 13.5	5 8.1
16	69 53.4	103	-26 57.4	12	35 39.2	-21 1.0	162 18.3	5 8.1
18	98 52.1	103	-26 55.0	14	65 42.9	-21 .8	192 23.2	5 8.1
20	127 50.8	104	-26 52.2	17	95 46.7	-21 .5	222 28.1	5 8.1
22	156 49.5	104	-26 48.8	19	125 50.4	-21 .3	252 33.0	5 8.1
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 58	0 58	2 46	9 17	1.6	13 5	2.8
55	8 25	15 37	0 45	2 18	8 13	1.8	14 9	2.5
50	7 58	16 4	0 38	1 59	7 34	1.9	14 48	2.4
45	7 37	16 24	0 34	1 47	7 6	2.0	15 16	2.4
40	7 21	16 41	0 31	1 38	6 43	2.0	15 38	2.3
35	7 6	16 55	0 28	1 31	6 25	2.0	15 56	2.3
30	6 54	17 8	0 26	1 25	6 9	2.0	16 12	2.2
20	6 33	17 29	0 24	1 19	5 43	2.1	16 39	2.2
10	6 14	17 47	0 23	1 15	5 20	2.1	17 2	2.1
0	5 57	18 5	0 23	1 15	4 58	2.1	17 23	2.1
10	5 39	18 22	0 23	1 18	4 37	2.1	17 44	2.1
20	5 21	18 41	0 25	1 24	4 14	2.2	18 7	2.0
30	4 59	19 3	0 27	1 36	3 47	2.2	18 33	1.9
35	4 46	19 16	0 30	1 47	3 32	2.2	18 49	1.9
40	4 31	19 31	0 33	2 3	3 14	2.2	19 7	1.9
45	4 13	19 49	0 37	2 33	2 52	2.2	19 29	1.8
50	3 50	20 11	0 45	: ::	2 24	2.2	19 56	1.7
55	3 20	20 41	0 58	: ::	1 46	2.3	20 34	1.5
60	2 36	21 25	1 44	: ::	0 44	2.3	21 35	1.1
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 0 32.2	-1.2	16.3	$T_{\overline{m}}$ 11 11	2.1	53.9	14.7
12	- 0 47.1	$T_{\overline{m}_\odot}$ 12 h .8 min		Starost 28.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 15	.2	36	-4.2	♄	13 38	.0	60	-1.8
♂	11 36	.1	91	1.3	♃	5 13	.0	187	.9

UT	SUNCE $S_\odot$	SUNCE $\delta_\odot$	PROLEĆ. TAČKA S_Υ	VENERA S_φ	VENERA δ_φ	MARS S_σ	MARS δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 44.5	-23 19.3	95 50.6	131 9.8	-15 56.4	186 6.5	-24 5.7
2	209 43.9	-23 19.1	125 55.6	161 9.4	-15 54.3	216 7.3	-24 5.8
4	239 43.2	-23 18.8	156 .5	191 8.9	-15 52.3	246 8.1	-24 5.8
6	269 42.6	-23 18.6	186 5.4	221 8.5	-15 50.2	276 9.0	-24 5.9
8	299 42.0	-23 18.4	216 10.3	251 8.0	-15 48.1	306 9.8	-24 5.9
10	329 41.4	-23 18.2	246 15.3	281 7.6	-15 46.1	336 10.6	-24 6.0
12	359 40.8	-23 17.9	276 20.2	311 7.1	-15 44.0	6 11.4	-24 6.0
14	29 40.2	-23 17.7	306 25.1	341 6.7	-15 41.9	36 12.3	-24 6.1
16	59 39.6	-23 17.4	336 30.1	11 6.2	-15 39.9	66 13.1	-24 6.1
18	89 38.9	-23 17.2	6 35.0	41 5.8	-15 37.8	96 13.9	-24 6.1
20	119 38.3	-23 17.0	36 39.9	71 5.4	-15 35.7	126 14.7	-24 6.2
22	149 37.7	-23 16.7	66 44.8	101 4.9	-15 33.6	156 15.5	-24 6.2
Δ	-3	1		-2	10	4	0

UT	MESEC $S_\leftmoon$	MESEC Δ	MESEC $\delta_\leftmoon$	MESEC Δ	JUPITER $S_{\mathrm{♃}}$	JUPITER $\delta_{\mathrm{♃}}$	SATURN $S_{\mathrm{♄}}$	SATURN $\delta_{\mathrm{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	185 48.4	104	-26 44.9	22	155 54.1	-21 .1	282 37.8	5 8.1
2	214 47.2	105	-26 40.5	25	185 57.9	-20 59.9	312 42.7	5 8.1
4	243 46.2	105	-26 35.6	27	216 1.6	-20 59.7	342 47.6	5 8.1
6	272 45.3	106	-26 30.2	30	246 5.3	-20 59.4	12 52.5	5 8.1
8	301 44.4	106	-26 24.3	32	276 9.1	-20 59.2	42 57.4	5 8.1
10	330 43.7	107	-26 17.9	35	306 12.8	-20 59.0	73 2.2	5 8.1
12	359 43.1	108	-26 11.0	37	336 16.5	-20 58.8	103 7.1	5 8.1
14	28 42.6	108	-26 3.5	40	6 20.3	-20 58.6	133 12.0	5 8.1
16	57 42.2	109	-25 55.6	42	36 24.0	-20 58.3	163 16.9	5 8.1
18	86 42.0	110	-25 47.2	44	66 27.7	-20 58.1	193 21.8	5 8.1
20	115 41.9	110	-25 38.3	47	96 31.5	-20 57.9	223 26.7	5 8.1
22	144 42.0	111	-25 29.0	49	126 35.2	-20 57.7	253 31.5	5 8.2
Δ					19	1	24	0

φ	SUNCE IZLAZ	SUNCE ZALAZ	TRAJANJE SUMRAKA GRAĐ.	TRAJANJE SUMRAKA ASTR.	MESEC IZLAZ	MESEC Δ/24	MESEC ZALAZ	MESEC Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	14 59	0 57	2 46	9 54	.8	14 13	3.5
55	8 25	15 38	0 45	2 17	8 56	1.3	15 10	3.0
50	7 58	16 4	0 38	1 59	8 19	1.5	15 46	2.7
45	7 38	16 25	0 34	1 47	7 53	1.6	16 13	2.6
40	7 21	16 42	0 31	1 38	7 31	1.7	16 34	2.5
35	7 7	16 56	0 28	1 31	7 13	1.8	16 51	2.4
30	6 54	17 8	0 26	1 25	6 58	1.8	17 6	2.3
20	6 33	17 29	0 24	1 19	6 32	1.9	17 31	2.2
10	6 15	17 48	0 23	1 15	6 10	2.0	17 53	2.1
0	5 58	18 5	0 23	1 15	5 49	2.1	18 13	2.0
10	5 40	18 23	0 23	1 18	5 28	2.1	18 33	1.9
20	5 21	18 41	0 25	1 24	5 6	2.2	18 55	1.8
30	4 59	19 3	0 27	1 36	4 40	2.3	19 20	1.7
35	4 46	19 16	0 30	1 47	4 24	2.4	19 35	1.7
40	4 31	19 31	0 33	2 3	4 6	2.4	19 51	1.6
45	4 13	19 49	0 37	2 32	3 45	2.5	20 12	1.5
50	3 51	20 11	0 44	: ::	3 18	2.6	20 37	1.3
55	3 21	20 41	0 58	: ::	2 40	2.8	21 11	1.1
60	2 37	21 25	1 42	: ::	1 40	3.2	22 2	.6
S								

SUNCE UT	SUNCE $e = T_p - UT$	SUNCE Δ/24	SUNCE r	MESEC Prolaz	MESEC Δ/24	MESEC $\pi_\leftmoon$	MESEC r
h	min s	s	′	h min	min	′	′
00	- 1 1.9	-1.2	16.3	$T_{\overline{m}}$ 12 1	2.1	53.9	14.7
12	- 1 16.7	$T_{\overline{m}_\odot}$ 12 h 1.3 min		Starost 29.3 d	Faza ●		

PLANETE

Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 16	.2	35	-4.2	♄	13 35	.0	60	-1.8
♂	11 35	.1	90	1.3	♃	5 9	.0	187	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 37.1	-23 16.5	96 49.8	131 4.5	-15 31.6	186 16.4	-24 6.2
2	209 36.5	-23 16.2	126 54.7	161 4.1	-15 29.5	216 17.2	-24 6.3
4	239 35.9	-23 15.9	156 59.6	191 3.7	-15 27.4	246 18.0	-24 6.3
6	269 35.3	-23 15.7	187 4.6	221 3.3	-15 25.3	276 18.8	-24 6.3
8	299 34.6	-23 15.4	217 9.5	251 2.9	-15 23.2	306 19.7	-24 6.3
10	329 34.0	-23 15.1	247 14.4	281 2.5	-15 21.1	336 20.5	-24 6.4
12	359 33.4	-23 14.9	277 19.3	311 2.0	-15 19.0	6 21.3	-24 6.4
14	29 32.8	-23 14.6	307 24.3	341 1.7	-15 16.9	36 22.1	-24 6.4
16	59 32.2	-23 14.3	337 29.2	11 1.3	-15 14.8	66 22.9	-24 6.4
18	89 31.6	-23 14.0	7 34.1	41 .9	-15 12.7	96 23.7	-24 6.4
20	119 31.0	-23 13.7	37 39.1	71 .5	-15 10.6	126 24.6	-24 6.4
22	149 30.4	-23 13.5	67 44.0	101 .1	-15 8.5	156 25.4	-24 6.4
Δ	-3	1		-2	10	4	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	173 42.2	112	-25 19.1	52	156 38.9	-20 57.4	283 36.4	5 8.2
2	202 42.6	113	-25 8.8	54	186 42.7	-20 57.2	313 41.3	5 8.2
4	231 43.1	114	-24 58.0	56	216 46.4	-20 57.0	343 46.2	5 8.2
6	260 43.8	114	-24 46.8	59	246 50.1	-20 56.8	13 51.1	5 8.2
8	289 44.7	115	-24 35.0	61	276 53.9	-20 56.6	43 56.0	5 8.2
10	318 45.8	116	-24 22.9	63	306 57.6	-20 56.3	74 .9	5 8.2
12	347 47.0	117	-24 10.2	65	337 1.3	-20 56.1	104 5.8	5 8.2
14	16 48.5	118	-23 57.2	68	7 5.0	-20 55.9	134 10.7	5 8.2
16	45 50.1	119	-23 43.7	70	37 8.8	-20 55.7	164 15.6	5 8.2
18	74 51.9	120	-23 29.7	72	67 12.5	-20 55.4	194 20.4	5 8.2
20	103 54.0	121	-23 15.4	74	97 16.2	-20 55.2	224 25.3	5 8.3
22	132 56.2	122	-23 .6	76	127 20.0	-20 55.0	254 30.2	5 8.3
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 4	15 0	0 57	2 45	10 13	.4	15 36	3.7
55	8 25	15 38	0 45	2 17	9 27	.9	16 21	3.2
50	7 58	16 5	0 38	1 59	8 55	1.1	16 52	2.9
45	7 38	16 26	0 34	1 47	8 31	1.3	17 15	2.7
40	7 21	16 42	0 31	1 38	8 12	1.4	17 33	2.6
35	7 7	16 57	0 28	1 31	7 56	1.5	17 49	2.5
30	6 55	17 9	0 26	1 25	7 42	1.6	18 2	2.4
20	6 34	17 30	0 24	1 19	7 19	1.8	18 25	2.2
10	6 15	17 48	0 23	1 15	6 58	1.9	18 44	2.1
0	5 58	18 6	0 23	1 15	6 39	2.0	19 2	2.0
10	5 41	18 23	0 23	1 18	6 19	2.1	19 20	1.8
20	5 22	18 42	0 25	1 24	5 59	2.2	19 39	1.7
30	4 60	19 4	0 27	1 36	5 35	2.4	20 1	1.5
35	4 47	19 17	0 30	1 47	5 21	2.4	20 14	1.4
40	4 32	19 31	0 33	2 3	5 4	2.5	20 29	1.3
45	4 14	19 49	0 37	2 32	4 45	2.7	20 47	1.2
50	3 52	20 12	0 44	: ::	4 20	2.8	21 8	1.0
55	3 22	20 41	0 58	: ::	3 47	3.1	21 36	.7
60	2 38	21 25	1 41	: ::	2 56	3.6	22 16	.3
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 1 31.4	-1.2	16.3	$T_{\overline{m}}$ 12 51	2.0	54.0	14.7
12	- 1 46.2	$T_{\overline{m}_\odot}$ 12 h	1.8 min	Starost .5 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 16	.2	34	-4.2	♃	13 32	.0	60	-1.8
♂	11 35	.1	89	1.3	♄	5 5	.0	187	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 29.7	-23 13.2	97 48.9	130 59.7	-15 6.4	186 26.2	-24 6.4
2	209 29.1	-23 12.9	127 53.8	160 59.3	-15 4.3	216 27.0	-24 6.5
4	239 28.5	-23 12.6	157 58.8	190 59.0	-15 2.2	246 27.8	-24 6.5
6	269 27.9	-23 12.3	188 3.7	220 58.6	-15 .1	276 28.6	-24 6.5
8	299 27.3	-23 12.0	218 8.6	250 58.2	-14 58.0	306 29.5	-24 6.5
10	329 26.7	-23 11.7	248 13.6	280 57.9	-14 55.8	336 30.3	-24 6.5
12	359 26.1	-23 11.3	278 18.5	310 57.5	-14 53.7	6 31.1	-24 6.5
14	29 25.5	-23 11.0	308 23.4	340 57.1	-14 51.6	36 31.9	-24 6.5
16	59 24.9	-23 10.7	338 28.3	10 56.8	-14 49.5	66 32.7	-24 6.5
18	89 24.3	-23 10.4	8 33.3	40 56.4	-14 47.3	96 33.5	-24 6.4
20	119 23.7	-23 10.1	38 38.2	70 56.1	-14 45.2	126 34.4	-24 6.4
22	149 23.1	-23 9.7	68 43.1	100 55.7	-14 43.1	156 35.2	-24 6.4
Δ	-3	2		-2	11	4	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	S_{4}	δ_{4}	S_η	δ_η
h	° ′		° ′		° ′	° ′	° ′	° ′
0	161 58.6	123	-22 45.4	78	157 23.7	-20 54.8	284 35.1	5 8.3
2	191 1.3	124	-22 29.7	80	187 27.4	-20 54.5	314 40.0	5 8.3
4	220 4.1	125	-22 13.7	82	217 31.2	-20 54.3	344 44.9	5 8.3
6	249 7.1	126	-21 57.3	84	247 34.9	-20 54.1	14 49.8	5 8.3
8	278 10.4	127	-21 40.4	86	277 38.6	-20 53.9	44 54.7	5 8.3
10	307 13.9	128	-21 23.2	88	307 42.3	-20 53.6	74 59.6	5 8.3
12	336 17.6	129	-21 5.6	90	337 46.1	-20 53.4	105 4.5	5 8.3
14	5 21.4	130	-20 47.7	92	7 49.8	-20 53.2	135 9.4	5 8.4
16	34 25.5	131	-20 29.3	94	37 53.5	-20 53.0	165 14.3	5 8.4
18	63 29.8	133	-20 10.6	95	67 57.3	-20 52.7	195 19.2	5 8.4
20	92 34.3	134	-19 51.5	97	98 1.0	-20 52.5	225 24.1	5 8.4
22	121 39.0	135	-19 32.1	99	128 4.7	-20 52.3	255 29.0	5 8.4
Δ					19	1	24	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 1	0 57	2 45	10 23	.2	17 3	3.7
55	8 25	15 39	0 45	2 17	9 48	.6	17 37	3.2
50	7 59	16 6	0 38	1 59	9 22	.9	18 1	3.0
45	7 38	16 27	0 34	1 47	9 3	1.1	18 20	2.8
40	7 21	16 43	0 31	1 37	8 47	1.2	18 35	2.6
35	7 7	16 57	0 28	1 31	8 33	1.3	18 48	2.5
30	6 55	17 9	0 26	1 25	8 21	1.5	18 59	2.4
20	6 34	17 30	0 24	1 19	8 1	1.6	19 18	2.2
10	6 16	17 49	0 23	1 15	7 43	1.8	19 34	2.0
0	5 59	18 6	0 22	1 15	7 27	1.9	19 49	1.9
10	5 41	18 23	0 23	1 18	7 10	2.0	20 4	1.7
20	5 22	18 42	0 25	1 24	6 52	2.2	20 20	1.6
30	5 0	19 4	0 27	1 36	6 31	2.4	20 38	1.4
35	4 48	19 17	0 30	1 47	6 19	2.5	20 49	1.3
40	4 33	19 32	0 33	2 2	6 5	2.6	21 1	1.1
45	4 15	19 49	0 37	2 31	5 49	2.7	21 15	1.0
50	3 53	20 12	0 44	: ::	5 28	2.9	21 32	.8
55	3 23	20 41	0 57	: ::	5 1	3.2	21 54	.5
60	2 39	21 25	1 40	: ::	4 22	3.7	22 24	.2
S								

SUNCE				MESEC			
UT	e = T_p − UT	Δ/24	r	Prolaz	Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	h min	min	′	′
00	- 2 .8	-1.2	16.3	$T_{\overline{m}}$ 13 38	1.9	54.1	14.8
12	- 2 15.4	$T_{\overline{m}_\odot}$ 12 h	2.3 min	Starost 1.5 d	Faza ●		

PLANETE								
Pl.	$T_{\overline{m}}$	π	360−α	Vel.	Pl.	$T_{\overline{m}}$	π	360−α	Vel.
	h min	′	°			h min	′	°	
♀	15 16	.2	33	-4.2	♃	13 29	.0	60	-1.8
♂	11 34	.1	89	1.3	♄	5 1	.0	187	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 22.5	-23 9.4	98 48.1	130 55.4	-14 40.9	186 36.0	-24 6.4
2	209 21.9	-23 9.1	128 53.0	160 55.1	-14 38.8	216 36.8	-24 6.4
4	239 21.3	-23 8.7	158 57.9	190 54.7	-14 36.7	246 37.6	-24 6.4
6	269 20.7	-23 8.4	189 2.8	220 54.4	-14 34.5	276 38.4	-24 6.4
8	299 20.0	-23 8.1	219 7.8	250 54.1	-14 32.4	306 39.2	-24 6.3
10	329 19.4	-23 7.7	249 12.7	280 53.8	-14 30.2	336 40.0	-24 6.3
12	359 18.8	-23 7.4	279 17.6	310 53.4	-14 28.1	6 40.8	-24 6.3
14	29 18.2	-23 7.0	309 22.6	340 53.1	-14 26.0	36 41.7	-24 6.3
16	59 17.6	-23 6.6	339 27.5	10 52.8	-14 23.8	66 42.5	-24 6.2
18	89 17.0	-23 6.3	9 32.4	40 52.5	-14 21.7	96 43.3	-24 6.2
20	119 16.4	-23 5.9	39 37.3	70 52.2	-14 19.5	126 44.1	-24 6.2
22	149 15.8	-23 5.6	69 42.3	100 51.9	-14 17.3	156 44.9	-24 6.1
Δ	-3	2		-2	11	4	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	150 43.9	136	-19 12.4	101	158 8.4	-20 52.1	285 33.9	5 8.4
2	179 49.1	137	-18 52.2	102	188 12.2	-20 51.8	315 38.8	5 8.4
4	208 54.4	138	-18 31.8	104	218 15.9	-20 51.6	345 43.7	5 8.5
6	237 59.9	138	-18 11.0	105	248 19.6	-20 51.4	15 48.6	5 8.5
8	267 5.6	139	-17 50.0	107	278 23.3	-20 51.2	45 53.6	5 8.5
10	296 11.5	140	-17 28.6	109	308 27.1	-20 50.9	75 58.5	5 8.5
12	325 17.5	141	-17 6.9	110	338 30.8	-20 50.7	106 3.4	5 8.5
14	354 23.8	142	-16 44.8	112	8 34.5	-20 50.5	136 8.3	5 8.5
16	23 30.2	143	-16 22.5	113	38 38.2	-20 50.2	166 13.2	5 8.6
18	52 36.8	144	-16 .0	114	68 42.0	-20 50.0	196 18.1	5 8.6
20	81 43.6	145	-15 37.1	116	98 45.7	-20 49.8	226 23.0	5 8.6
22	110 50.5	145	-15 13.9	117	128 49.4	-20 49.6	256 27.9	5 8.6
Δ					19	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 3	0 57	2 45	10 28	.1	18 31	3.6
55	8 25	15 40	0 45	2 17	10 3	.5	18 55	3.2
50	7 59	16 7	0 38	1 59	9 44	.7	19 12	3.0
45	7 38	16 27	0 34	1 47	9 29	.9	19 26	2.8
40	7 22	16 44	0 30	1 37	9 16	1.1	19 37	2.6
35	7 8	16 58	0 28	1 31	9 6	1.2	19 47	2.5
30	6 55	17 10	0 26	1 25	8 56	1.3	19 55	2.3
20	6 35	17 31	0 24	1 19	8 40	1.5	20 10	2.1
10	6 16	17 49	0 23	1 15	8 26	1.7	20 22	2.0
0	5 59	18 6	0 22	1 15	8 12	1.8	20 34	1.8
10	5 42	18 24	0 23	1 17	7 59	2.0	20 45	1.6
20	5 23	18 43	0 25	1 24	7 45	2.1	20 57	1.5
30	5 1	19 4	0 27	1 36	7 28	2.3	21 11	1.3
35	4 48	19 17	0 30	1 46	7 18	2.5	21 19	1.1
40	4 33	19 32	0 33	2 2	7 7	2.6	21 28	1.0
45	4 16	19 50	0 37	2 31	6 54	2.8	21 39	.9
50	3 53	20 12	0 44	: ::	6 38	3.0	21 51	.7
55	3 24	20 41	0 57	: ::	6 18	3.2	22 7	.4
60	2 40	21 24	1 38	: ::	5 50	3.6	22 28	.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	- 2 30.0	-1.2	16.3	T_m	14 23	1.8	54.4	14.8
12	- 2 44.4	$T_{m_\odot}$ 12 h	2.7 min	Starost	2.5 d	Faza	●	

PLANETE								
Pl.	T_m	π	360 − α	Vel.	Pl.	T_m	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 16	.2	32	-4.2	♄	13 26	.0	59	-1.8
♂	11 33	.1	88	1.3	♇	4 57	.0	187	.9

UT	SUNCE		PROLEĆ. TAČKA	VENERA		MARS	
	$S_\odot$	$\delta_\odot$	S_Υ	S_φ	δ_φ	S_σ	δ_σ
h	° ′	° ′	° ′	° ′	° ′	° ′	° ′
0	179 15.2	-23 5.2	99 47.2	130 51.6	-14 15.2	186 45.7	-24 6.1
2	209 14.6	-23 4.8	129 52.1	160 51.3	-14 13.0	216 46.5	-24 6.1
4	239 14.0	-23 4.4	159 57.0	190 51.0	-14 10.9	246 47.3	-24 6.0
6	269 13.4	-23 4.1	190 2.0	220 50.7	-14 8.7	276 48.1	-24 6.0
8	299 12.9	-23 3.7	220 6.9	250 50.4	-14 6.5	306 48.9	-24 6.0
10	329 12.3	-23 3.3	250 11.8	280 50.2	-14 4.4	336 49.8	-24 5.9
12	359 11.7	-23 2.9	280 16.8	310 49.9	-14 2.2	6 50.6	-24 5.9
14	29 11.1	-23 2.5	310 21.7	340 49.6	-14 .0	36 51.4	-24 5.8
16	59 10.5	-23 2.1	340 26.6	10 49.4	-13 57.8	66 52.2	-24 5.8
18	89 9.9	-23 1.7	10 31.5	40 49.1	-13 55.7	96 53.0	-24 5.7
20	119 9.3	-23 1.3	40 36.5	70 48.8	-13 53.5	126 53.8	-24 5.7
22	149 8.7	-23 .9	70 41.4	100 48.6	-13 51.3	156 54.6	-24 5.6
Δ	-3	2		-1	11	4	0

UT	MESEC				JUPITER		SATURN	
	$S_\leftmoon$	Δ	$\delta_\leftmoon$	Δ	$S_{\text{♃}}$	$\delta_{\text{♃}}$	$S_{\text{♄}}$	$\delta_{\text{♄}}$
h	° ′		° ′		° ′	° ′	° ′	° ′
0	139 57.6	146	-14 50.5	118	158 53.1	-20 49.3	286 32.8	5 8.6
2	169 4.9	147	-14 26.8	120	188 56.9	-20 49.1	316 37.7	5 8.6
4	198 12.3	148	-14 2.9	121	219 .6	-20 48.9	346 42.7	5 8.7
6	227 19.8	148	-13 38.7	122	249 4.3	-20 48.6	16 47.6	5 8.7
8	256 27.5	149	-13 14.2	123	279 8.0	-20 48.4	46 52.5	5 8.7
10	285 35.3	150	-12 49.6	125	309 11.8	-20 48.2	76 57.4	5 8.7
12	314 43.2	150	-12 24.7	126	339 15.5	-20 48.0	107 2.3	5 8.7
14	343 51.3	151	-11 59.5	127	9 19.2	-20 47.7	137 7.2	5 8.8
16	12 59.5	151	-11 34.2	128	39 22.9	-20 47.5	167 12.2	5 8.8
18	42 7.7	152	-11 8.6	129	69 26.7	-20 47.3	197 17.1	5 8.8
20	71 16.1	152	-10 42.8	130	99 30.4	-20 47.0	227 22.0	5 8.8
22	100 24.6	153	-10 16.8	131	129 34.1	-20 46.8	257 26.9	5 8.8
Δ					19	1	25	0

φ	SUNCE		TRAJANJE SUMRAKA		MESEC			
	IZLAZ	ZALAZ	GRAĐ.	ASTR.	IZLAZ	Δ/24	ZALAZ	Δ/24
N	h min	h min	h min	h min	h min	min	h min	min
60	9 3	15 4	0 57	2 45	10 32	.1	19 57	3.5
55	8 25	15 42	0 45	2 17	10 14	.4	20 12	3.2
50	7 59	16 8	0 38	1 59	10 1	.6	20 23	3.0
45	7 38	16 28	0 34	1 46	9 51	.8	20 32	2.8
40	7 22	16 45	0 30	1 37	9 42	1.0	20 39	2.6
35	7 8	16 59	0 28	1 30	9 34	1.1	20 46	2.4
30	6 56	17 11	0 26	1 25	9 28	1.2	20 51	2.3
20	6 35	17 32	0 24	1 18	9 16	1.4	21 1	2.1
10	6 17	17 50	0 23	1 15	9 6	1.6	21 9	1.9
0	5 59	18 7	0 22	1 15	8 56	1.8	21 17	1.8
10	5 42	18 24	0 23	1 17	8 47	1.9	21 24	1.6
20	5 24	18 43	0 24	1 24	8 36	2.1	21 32	1.4
30	5 2	19 5	0 27	1 36	8 24	2.3	21 42	1.2
35	4 49	19 17	0 30	1 46	8 17	2.4	21 47	1.1
40	4 34	19 32	0 33	2 2	8 10	2.6	21 53	.9
45	4 17	19 50	0 37	2 30	8 0	2.8	21 59	.8
50	3 54	20 12	0 44	: ::	7 49	3.0	22 8	.6
55	3 25	20 41	0 57	: ::	7 35	3.2	22 18	.4
60	2 42	21 24	1 37	: ::	7 17	3.6	22 30	.1
S								

SUNCE				MESEC			
UT	e = Tp − UT	Δ/24	r	Prolaz		Δ/24	$\pi_\leftmoon$	r
h	min s	s	′	T_m	h min	min	′	′
00	- 2 58.8	-1.2	16.3	T_m	15 6	1.8	54.7	14.9
12	- 3 13.2	$T_{m_\odot}$ 12 h	3.2 min	Starost	3.5 d	Faza	●	

PLANETE								
Pl.	T_m	π	360 − α	Vel.	Pl.	T_m	π	360 − α	Vel.
	h min	′	°			h min	′	°	
♀	15 17	.2	31	-4.2	♄	13 23	.0	59	-1.8
♂	11 33	.1	87	1.3	♇	4 53	.0	187	.9

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NAUTIČKIH ZVEZDA

SUREKTASCENZIJE NAUTIČKIH ZVEZDA

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R.b.	Ime zvezde	$360^{\circ}-\alpha$	2008 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2009 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	ALPHERATZ	357	47.9	48.0	48.1	48.0	47.9	47.7	47.4	47.2	47.0	46.9	46.9	47.0	47.1
2	CAPH	357	36.0	36.2	36.4	36.3	36.1	35.8	35.4	35.0	34.8	34.7	34.7	34.9	35.1
3	DIPHDA	348	60.0	0.1	0.1	0.1	0.0	59.8	59.6	59.3	59.1	59.0	59.0	59.1	59.2
4	ACHERNAR	335	29.4	29.7	29.9	30.0	29.9	29.7	29.4	29.1	28.7	28.6	28.5	28.6	28.8
5	HAMAL	328	5.4	5.5	5.6	5.6	5.6	5.4	5.2	4.9	4.7	4.5	4.4	4.4	4.4
6	POLARIS	319	31.7	43.9	55.9	4.8	6.5	0.7	49.1	34.3	20.0	8.6	1.8	1.9	9.4
7	MIRFAK	308	46.1	46.2	46.4	46.5	46.6	46.5	46.2	45.8	45.5	45.2	45.0	44.9	44.9
8	ALDEBARAN	290	53.8	53.9	54.0	54.1	54.2	54.1	54.0	53.8	53.5	53.3	53.1	53.0	52.9
9	RIGEL	281	15.7	15.7	15.8	16.0	16.1	16.1	16.0	15.8	15.6	15.3	15.1	15.0	14.9
10	CAPELLA	280	40.1	40.2	40.3	40.5	40.6	40.6	40.5	40.2	39.9	39.6	39.3	39.0	38.9
11	BELLATRIX	278	36.1	36.1	36.2	36.4	36.4	36.4	36.3	36.1	35.9	35.7	35.5	35.3	35.2
12	EL NATH	278	17.5	17.5	17.6	17.8	17.8	17.8	17.7	17.5	17.3	17.0	16.8	16.6	16.5
13	ALNILAM	275	50.2	50.3	50.3	50.5	50.6	50.6	50.5	50.3	50.1	49.9	49.7	49.5	49.4
14	BETELGEUSE	271	5.4	5.4	5.5	5.6	5.7	5.8	5.7	5.5	5.3	5.1	4.8	4.7	4.6
15	CANOPUS	263	57.4	57.5	57.7	58.0	58.2	58.4	58.4	58.2	58.0	57.7	57.4	57.2	57.1
16	SIRIUS	258	37.0	37.0	37.1	37.2	37.4	37.4	37.4	37.3	37.1	36.9	36.6	36.4	36.3
17	ADHARA	255	15.4	15.4	15.5	15.6	15.8	15.9	15.9	15.8	15.6	15.4	15.1	14.9	14.8
18	PROCYON	245	3.7	3.6	3.7	3.8	3.9	4.0	4.0	3.9	3.7	3.5	3.3	3.0	2.9
19	POLLUX	243	32.4	32.3	32.3	32.4	32.5	32.6	32.6	32.5	32.3	32.1	31.8	31.6	31.4
20	AVIOR	234	19.3	19.2	19.3	19.6	19.9	20.2	20.3	20.3	20.2	19.9	19.5	19.2	18.9
21	AL SUHAIL	222	55.2	55.1	55.1	55.2	55.4	55.6	55.7	55.7	55.6	55.4	55.2	54.9	54.6
22	MIAPLACIDUS	221	40.2	40.0	40.1	40.4	40.8	41.3	41.6	41.8	41.7	41.4	40.9	40.3	39.9
23	ALPHARD	217	59.9	59.8	59.7	59.8	59.9	60.0	0.0	0.0	59.9	59.8	59.6	59.3	59.1
24	REGULUS	207	47.7	47.5	47.4	47.4	47.5	47.6	47.7	47.7	47.6	47.5	47.3	47.0	46.8
25	DUBHE	193	56.1	55.7	55.5	55.5	55.7	56.0	56.2	56.3	56.4	56.3	56.0	55.6	55.1
26	DENEBOLA	182	37.7	37.5	37.4	37.3	37.3	37.4	37.5	37.5	37.6	37.5	37.4	37.2	36.9
27	ACRUX	173	14.3	13.9	13.6	13.5	13.5	13.7	13.9	14.2	14.4	14.4	14.2	13.8	13.3
28	GACRUX	172	5.8	5.4	5.2	5.1	5.1	5.2	5.4	5.6	5.7	5.7	5.6	5.3	4.8
29	MINOSA	167	57.2	56.8	56.5	56.3	56.3	56.4	56.6	56.8	57.0	57.1	56.9	56.6	56.2
30	ALIOTH	166	24.1	23.7	23.4	23.3	23.3	23.4	23.6	23.8	24.0	24.1	24.0	23.7	23.4
31	MIZAR	158	56.1	55.8	55.5	55.3	55.3	55.4	55.6	55.8	56.0	56.1	56.1	55.9	55.5
32	SPICA	158	35.7	35.5	35.3	35.1	35.1	35.1	35.1	35.2	35.3	35.3	35.3	35.1	34.8
33	ALKAID	153	2.1	1.8	1.5	1.3	1.3	1.3	1.5	1.7	1.8	1.9	1.9	1.8	1.5
34	MENKENT	148	12.7	12.4	12.2	12.0	11.9	11.9	11.9	12.0	12.2	12.2	12.2	12.0	11.7
35	ARCTURUS	145	59.6	59.3	59.1	59.0	58.9	58.9	58.9	59.0	59.1	59.2	59.2	59.1	58.8
36	RIGEL KENTAURUS	139	58.1	57.6	57.2	56.9	56.8	56.7	56.9	57.1	57.3	57.5	57.5	57.3	56.9
37	KOHAB	137	20.0	19.4	18.8	18.3	18.2	18.3	18.7	19.3	19.9	20.3	20.6	20.5	20.1
38	ALPHECCA	126	14.7	14.5	14.2	14.0	13.9	13.8	13.8	13.9	14.1	14.2	14.3	14.2	14.0
39	DSCHUBBA	119	48.0	47.8	47.5	47.3	47.1	47.0	47.0	47.0	47.1	47.3	47.3	47.2	47.1
40	ANTARES	112	31.7	31.5	31.2	30.9	30.7	30.6	30.6	30.6	30.7	30.8	30.9	30.9	30.7
41	ATRIA	107	37.9	37.4	36.8	36.2	35.7	35.4	35.3	35.5	35.8	36.2	36.4	36.4	36.1
42	SHAULA	96	28.0	27.7	27.4	27.1	26.9	26.7	26.6	26.6	26.7	26.8	27.0	27.0	26.8
43	RASALHAGUE	96	10.6	10.4	10.2	10.0	9.8	9.7	9.6	9.6	9.7	9.8	9.9	9.9	9.9
44	ELTANIN	90	48.6	48.4	48.2	47.8	47.6	47.4	47.3	47.4	47.6	47.9	48.1	48.2	48.2
45	KAUS AUSTRALIS	83	49.7	49.5	49.3	49.0	48.7	48.5	48.3	48.3	48.4	48.5	48.6	48.7	48.6
46	VEGA	80	42.2	42.1	41.9	41.6	41.4	41.2	41.1	41.1	41.2	41.4	41.6	41.7	41.7
47	NUNKI	76	3.8	3.6	3.4	3.2	2.9	2.7	2.5	2.5	2.5	2.7	2.8	2.8	2.8
48	ALTAIR	62	12.6	12.5	12.4	12.2	11.9	11.7	11.6	11.5	11.5	11.6	11.7	11.8	11.8
49	PEACOCK	53	26.1	26.0	25.8	25.5	25.1	24.7	24.4	24.2	24.2	24.4	24.6	24.8	24.9
50	DENEB	49	34.8	34.8	34.7	34.5	34.2	33.9	33.7	33.6	33.6	33.8	34.0	34.2	34.3
51	ENIF	33	51.4	51.5	51.4	51.2	51.0	50.8	50.6	50.4	50.4	50.4	50.5	50.6	50.6
52	AL NA IR	27	49.0	49.1	49.0	48.8	48.5	48.2	47.9	47.7	47.6	47.6	47.7	47.9	48.0
53	FOMALHAUT	15	28.6	28.6	28.6	28.5	28.3	28.1	27.8	27.6	27.5	27.4	27.5	27.6	27.7
54	MARKAB	13	42.6	42.7	42.7	42.6	42.4	42.2	42.0	41.7	41.6	41.6	41.7	41.7	41.8

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R.b.	Zvezda–Sazvežđe	δ	2008 JAN	FEB	MAR	APR	MAJ	JUN	JUL	AVG	SEP	OKT	NOV	DEC	2009 JAN
		°	′	′	′	′	′	′	′	′	′	′	′	′	′
1	α Andromedae	29	8.3	8.2	8.1	8.1	8.1	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.6
2	β Cassiopeae	59	12.0	11.9	11.8	11.7	11.6	11.5	11.6	11.7	11.9	12.1	12.2	12.3	12.3
3	β Ceti	−17	56.6	56.6	56.6	56.5	56.4	56.3	56.2	56.1	56.1	56.1	56.2	56.2	56.3
4	α Eridani	−57	12.0	12.0	11.9	11.7	11.5	11.4	11.2	11.2	11.2	11.3	11.4	11.6	11.6
5	α Arietis	23	30.2	30.2	30.1	30.1	30.1	30.1	30.2	30.2	30.3	30.4	30.5	30.5	30.5
6	α Ursae Minoris	89	18.3	18.4	18.4	18.3	18.1	18.0	17.9	17.9	18.0	18.1	18.3	18.4	18.6
7	α Persei	49	53.7	53.7	53.7	53.6	53.5	53.4	53.4	53.4	53.5	53.6	53.7	53.8	53.9
8	α Tauri	16	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.7	31.7	31.8	31.8	31.8	31.7
9	β Orionis	− 8	11.5	11.6	11.6	11.6	11.5	11.5	11.4	11.3	11.2	11.2	11.3	11.4	11.4
10	α Aurigae	46	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6
11	γ Orionis	6	21.5	21.5	21.4	21.4	21.5	21.5	21.5	21.6	21.6	21.6	21.6	21.6	21.5
12	β Tauri	28	37.0	37.0	37.0	37.0	37.0	36.9	36.9	36.9	36.9	36.9	37.0	37.0	37.0
13	ε Orionis	− 1	11.7	11.8	11.8	11.8	11.8	11.8	11.7	11.6	11.6	11.6	11.6	11.7	11.7
14	α Orionis	7	24.6	24.5	24.5	24.5	24.5	24.6	24.6	24.7	24.7	24.7	24.7	24.6	24.6
15	α Carinae	−52	41.9	42.1	42.2	42.2	42.2	42.1	41.9	41.7	41.6	41.6	41.7	41.8	42.0
16	α Canis Majoris	−16	43.6	43.7	43.8	43.8	43.7	43.7	43.6	43.5	43.4	43.4	43.5	43.6	43.7
17	ε Canis Majoris	−28	58.9	59.1	59.1	59.2	59.1	59.1	59.0	58.8	58.7	58.7	58.8	58.9	59.0
18	α Canis Minoris	5	12.3	12.2	12.2	12.2	12.2	12.2	12.3	12.3	12.3	12.3	12.3	12.2	12.1
19	β Geminorum	28	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2
20	ε Carinae	−59	31.9	32.1	32.3	32.4	32.5	32.4	32.3	32.1	32.0	31.9	31.9	32.0	32.2
21	λ Velorum	−43	27.7	27.9	28.1	28.2	28.2	28.2	28.1	28.0	27.9	27.8	27.8	27.9	28.0
22	β Carinae	−69	44.8	45.0	45.2	45.3	45.4	45.4	45.3	45.2	45.0	44.9	44.9	44.9	45.1
23	α Hydrae	− 8	41.6	41.7	41.8	41.8	41.8	41.8	41.8	41.7	41.6	41.6	41.7	41.8	41.9
24	α Leonis	11	55.6	55.5	55.5	55.5	55.5	55.6	55.6	55.6	55.6	55.5	55.4	55.4	55.3
25	α Ursae Majoris	61	42.1	42.2	42.3	42.4	42.5	42.6	42.5	42.4	42.3	42.1	41.9	41.8	41.8
26	β Leonis	14	31.5	31.4	31.4	31.4	31.4	31.5	31.5	31.5	31.5	31.4	31.3	31.2	31.1
27	α Crucis	−63	8.4	8.5	8.7	8.8	9.0	9.1	9.1	9.1	9.0	8.9	8.7	8.7	8.7
28	γ Crucis	−57	9.3	9.4	9.6	9.7	9.9	10.0	10.0	10.0	9.9	9.7	9.6	9.6	9.6
29	β Crucis	−59	43.7	43.8	44.0	44.2	44.3	44.4	44.5	44.4	44.3	44.2	44.1	44.1	44.1
30	ε Ursae Majoris	55	54.6	54.6	54.6	54.7	54.9	55.0	55.0	55.0	54.9	54.7	54.6	54.4	54.3
31	ζ Ursae Majoris	54	52.6	52.6	52.6	52.7	52.9	53.0	53.0	53.0	52.9	52.8	52.6	52.4	52.3
32	α Virginis	−11	12.2	12.3	12.4	12.5	12.5	12.5	12.5	12.4	12.4	12.4	12.4	12.5	12.6
33	η Ursae Majoris	49	16.0	16.0	16.0	16.1	16.2	16.3	16.4	16.4	16.3	16.2	16.1	15.9	15.7
34	θ Centauri	−36	24.5	24.6	24.7	24.8	24.9	24.9	25.0	25.0	24.9	24.8	24.8	24.8	24.8
35	α Bootis	19	8.2	8.1	8.1	8.1	8.2	8.2	8.3	8.3	8.3	8.3	8.2	8.0	7.9
36	α Centauri	−60	52.0	52.0	52.1	52.2	52.4	52.5	52.6	52.6	52.6	52.5	52.3	52.2	52.2
37	β Ursae Minoris	74	7.0	6.9	6.9	7.0	7.1	7.3	7.4	7.4	7.4	7.2	7.1	6.9	6.7
38	α Coronae Borealis	26	41.0	40.9	40.9	40.9	41.0	41.1	41.2	41.3	41.3	41.2	41.1	41.0	40.8
39	δ Scorpii	−22	38.7	38.8	38.8	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.8	38.8	38.9
40	α Scorpii	−26	27.0	27.1	27.1	27.1	27.2	27.2	27.2	27.2	27.2	27.2	27.1	27.1	27.1
41	α Trianguli Australi	−69	2.5	2.4	2.4	2.4	2.5	2.7	2.8	2.9	2.9	2.9	2.8	2.7	2.6
42	λ Scorpii	−37	6.6	6.6	6.6	6.6	6.6	6.7	6.7	6.7	6.8	6.8	6.7	6.7	6.6
43	α Ophiuchi	12	33.1	33.0	32.9	32.9	33.0	33.1	33.2	33.3	33.3	33.3	33.3	33.2	33.1
44	γ Draconis	51	29.1	28.9	28.8	28.8	28.9	29.1	29.2	29.4	29.5	29.5	29.4	29.3	29.1
45	ε Sagittarii	−34	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	23.0	23.0	22.9	22.9	22.9
46	α Lyrae	38	47.3	47.2	47.1	47.1	47.1	47.3	47.4	47.6	47.7	47.7	47.7	47.6	47.4
47	σ Sagittarii	−26	17.3	17.3	17.3	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2
48	α Aquilae	8	53.3	53.2	53.2	53.2	53.2	53.3	53.4	53.5	53.6	53.6	53.6	53.6	53.5
49	α Pavonis	−56	42.7	42.6	42.5	42.4	42.3	42.3	42.3	42.4	42.5	42.6	42.6	42.6	42.5
50	α Cygni	45	18.6	18.5	18.3	18.3	18.3	18.4	18.5	18.7	18.9	19.0	19.0	19.0	18.9
51	ε Pegasi	9	54.7	54.6	54.6	54.6	54.6	54.7	54.8	55.0	55.0	55.1	55.1	55.1	55.0
52	α Gruis	−46	55.5	55.5	55.3	55.2	55.1	55.0	54.9	55.0	55.0	55.1	55.2	55.2	55.2
53	α Piscis Austrini	−29	34.9	34.9	34.8	34.7	34.6	34.5	34.4	34.4	34.4	34.5	34.5	34.6	34.6
54	α Pegasi	15	15.0	14.9	14.9	14.8	14.9	14.9	15.1	15.2	15.3	15.4	15.4	15.4	15.3

VREMENA GORNJIH PROLAZA NAUTIČKIH ZVEZDA

kroz meridijan u Griniču

za 1. u mesecu

R.b.	Ime zvezde	2008 JAN		FEB		MAR		APR		MAJ		JUN		JUL		AVG		SEP		OKT		NOV		DEC		2009 JAN	
		h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min	h	min
1	ALPHERATZ	17	29	15	26	13	32	11	30	9	32	7	29	5	31	3	29	1	27	23	28	21	26	19	28	17	26
2	CAPH	17	29	15	27	13	33	11	31	9	32	7	30	5	32	3	30	1	28	23	29	21	27	19	29	17	27
3	DIPHDA	18	4	16	2	14	7	12	5	10	7	8	5	6	6	4	4	2	2	0	4	22	1	20	3	18	1
4	ACHERNAR	18	58	16	56	15	1	12	59	11	1	8	59	7	0	4	58	2	56	0	58	22	55	20	57	18	55
5	HAMAL	19	28	17	25	15	31	13	29	11	30	9	28	7	30	5	28	3	26	1	27	23	25	21	27	19	25
6	POLARIS	2	48	0	46	22	51	20	49	18	50	16	48	14	49	12	47	10	45	8	47	6	45	4	47	2	45
7	MIRFAK	20	45	18	43	16	48	14	46	12	48	10	46	8	47	6	45	4	43	2	45	0	42	22	44	20	42
8	ALDEBARAN	21	56	19	54	17	60	15	57	13	59	11	57	9	59	7	57	5	54	3	56	1	54	23	56	21	53
9	RIGEL	22	35	20	33	18	38	16	36	14	38	12	36	10	37	8	35	6	33	4	35	2	32	0	34	22	32
10	CAPELLA	22	37	20	35	18	41	16	38	14	40	12	38	10	40	8	37	6	35	4	37	2	35	0	37	22	34
11	BELLATRIX	22	45	20	43	18	49	16	47	14	48	12	46	10	48	8	46	6	43	4	45	2	43	0	45	22	43
12	EL NATH	22	47	20	44	18	50	16	48	14	50	12	47	10	49	8	47	6	45	4	46	2	44	0	46	22	44
13	ALNILAM	22	57	20	54	18	60	16	58	14	59	12	57	10	59	8	57	6	55	4	56	2	54	0	56	22	54
14	BETELGEUSE	23	16	21	13	19	19	17	17	15	18	13	16	11	18	9	16	7	14	5	15	3	13	1	15	23	13
15	CANOPUS	23	44	21	42	19	47	17	45	15	47	13	45	11	46	9	44	7	42	5	44	3	42	1	43	23	41
16	SIRIUS	0	5	22	3	20	9	18	7	16	8	14	6	12	8	10	6	8	3	6	5	4	3	2	5	0	2
17	ADHARA	0	19	22	17	20	22	18	20	16	22	14	20	12	21	10	19	8	17	6	19	4	16	2	18	0	16
18	PROCYON	0	60	22	57	21	3	19	1	17	3	15	0	13	2	10	60	8	58	6	59	4	57	2	59	0	57
19	POLLUX	1	6	23	4	21	9	19	7	17	9	15	6	13	8	11	6	9	4	7	5	5	3	3	5	1	3
20	AVIOR	1	43	23	40	21	46	19	44	17	45	15	43	13	45	11	43	9	41	7	42	5	40	3	42	1	40
21	AL SUHAIL	2	28	0	26	22	32	20	29	18	31	16	29	14	31	12	28	10	26	8	28	6	26	4	27	2	25
22	MIAPLACIDUS	2	33	0	31	22	37	20	34	18	36	16	34	14	36	12	33	10	31	8	33	6	31	4	32	2	30
23	ALPHARD	2	48	0	46	22	51	20	49	18	51	16	49	14	50	12	48	10	46	8	48	6	45	4	47	2	45
24	REGULUS	3	29	1	26	23	32	21	30	19	32	17	29	15	31	13	29	11	27	9	28	7	26	5	28	3	26
25	DUBHE	4	24	2	22	0	28	22	25	20	27	18	25	16	27	14	24	12	22	10	24	8	22	6	23	4	21
26	DENEBOLA	5	9	3	7	1	13	23	11	21	12	19	10	17	12	15	10	13	7	11	9	9	7	7	9	5	6
27	ACRUX	5	47	3	45	1	50	23	48	21	50	19	48	17	49	15	47	13	45	11	47	9	44	7	46	5	44
28	GACRUX	5	51	3	49	1	55	23	53	21	54	19	52	17	54	15	52	13	49	11	51	9	49	7	51	5	49
29	MINOSA	6	8	4	6	2	12	0	9	22	11	20	9	18	11	16	8	14	6	12	8	10	6	8	7	6	5
30	ALIOTH	6	14	4	12	2	18	0	16	22	17	20	15	18	17	16	15	14	12	12	14	10	12	8	14	6	11
31	MIZAR	6	44	4	42	2	48	0	45	22	47	20	45	18	47	16	44	14	42	12	44	10	42	8	43	6	41
32	SPICA	6	45	4	43	2	49	0	47	22	48	20	46	18	48	16	46	14	44	12	45	10	43	8	45	6	43
33	ALKAID	7	8	5	6	3	11	1	9	23	11	21	9	19	10	17	8	15	6	13	7	11	5	9	7	7	5
34	MENKENT	7	27	5	25	3	31	1	28	23	30	21	28	19	30	17	27	15	25	13	27	11	25	9	26	7	24
35	ARCTURUS	7	36	5	34	3	39	1	37	23	39	21	37	19	38	17	36	15	34	13	36	11	33	9	35	7	33
36	RIGEL KENTAURUS	7	60	5	58	4	4	2	1	0	3	22	1	20	3	18	0	15	58	13	60	11	58	9	59	7	57
37	KOHAB	8	11	6	8	4	14	2	12	0	14	22	11	20	13	18	11	16	9	14	10	12	8	10	10	8	8
38	ALPHECCA	8	55	6	53	4	58	2	56	0	58	22	56	20	57	18	55	16	53	14	55	12	52	10	54	8	52
39	DSCHUBBA	9	21	7	18	5	24	3	22	1	24	23	21	21	23	19	21	17	19	15	20	13	18	11	20	9	18
40	ANTARES	9	50	7	48	5	53	3	51	1	53	23	51	21	52	19	50	17	48	15	50	13	47	11	49	9	47
41	ATRIA	10	9	8	7	6	13	4	11	2	12	0	10	22	12	20	10	18	7	16	9	14	7	12	9	10	6
42	SHAULA	10	54	8	52	6	57	4	55	2	57	0	55	22	57	20	54	18	52	16	54	14	52	12	53	10	51
43	RASALHAGUE	10	55	8	53	6	59	4	56	2	58	0	56	22	58	20	55	18	53	16	55	14	53	12	54	10	52
44	ELTANIN	11	17	9	14	7	20	5	18	3	20	1	17	23	19	21	17	19	15	17	16	15	14	13	16	11	14
45	KAUS AUSTRALIS	11	45	9	42	7	48	5	46	3	48	1	45	23	47	21	45	19	43	17	44	15	42	13	44	11	42
46	VEGA	11	57	9	55	8	1	5	58	4	0	1	58	23	60	21	57	19	55	17	57	15	55	13	56	11	54
47	NUNKI	12	16	10	13	8	19	6	17	4	19	2	16	0	18	22	16	20	14	18	15	16	13	14	15	12	13
48	ALTAIR	13	11	11	9	9	14	7	12	5	14	3	12	1	14	23	11	21	9	19	11	17	9	15	10	13	8
49	PEACOCK	13	46	11	44	9	50	7	47	5	49	3	47	1	49	23	46	21	44	19	46	17	44	15	45	13	43
50	DENEB	14	2	11	59	10	5	8	3	6	5	4	2	2	4	0	2	21	60	20	1	17	59	16	1	13	59
51	ENIF	15	4	13	2	11	8	9	6	7	7	5	5	3	7	1	5	23	3	21	4	19	2	17	4	15	2
52	AL NA IR	15	29	13	26	11	32	9	30	7	32	5	29	3	31	1	29	23	27	21	28	19	26	17	28	15	26
53	FOMALHAUT	16	18	14	16	12	21	10	19	8	21	6	19	4	20	2	18	0	16	22	18	20	16	18	17	16	15
54	MARKAB	16	25	14	23	12	28	10	26	8	28	6	26	4	28	2	25	0	23	22	25	20	23	18	24	16	22

POPRAVKA ZA DATUM

uvek se oduzima

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min	h min
0 00	0 04	0 08	0 12	0 16	0 20	0 24	0 28	0 31	0 35	0 39	0 43	0 47	0 51	0 55	0 59	1 03	1 07	1 11	1 15	1 19	1 23	1 27	1 30	1 34	1 38	1 42	1 46	1 50	1 54	1 58

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Tablice

ZA

ODREĐIVANJE GEOGRAFSKE ŠIRINE

POMOĆU VISINE I AZIMUTA SEVERNJAČE

TABLICA I

S♈	Popravka
°	′
0	-32.3
1	-32.7
2	-33.2
3	-33.6
4	-34.1
5	-34.5
6	-34.9
7	-35.3
8	-35.7
9	-36.0
10	-36.4
11	-36.8
12	-37.1
13	-37.4
14	-37.8
15	-38.1
16	-38.4
17	-38.6
18	-38.9
19	-39.2
20	-39.4
21	-39.7
22	-39.9
23	-40.1
24	-40.3
25	-40.5
26	-40.7
27	-40.8
28	-41.0
29	-41.1
30	-41.2
31	-41.3
32	-41.4
33	-41.5
34	-41.6
35	-41.7
36	-41.7
37	-41.8
38	-41.8
39	-41.8
40	-41.8
41	-41.8
42	-41.8
43	-41.7
44	-41.7
45	-41.6
46	-41.5
47	-41.4
48	-41.3
49	-41.2
50	-41.1
51	-40.9
52	-40.8
53	-40.6
54	-40.5
55	-40.3
56	-40.1
57	-39.8
58	-39.6
59	-39.4
60	-39.1

S♈	Popravka
°	′
60	-39.1
61	-38.9
62	-38.6
63	-38.3
64	-38.0
65	-37.7
66	-37.4
67	-37.1
68	-36.7
69	-36.4
70	-36.0
71	-35.6
72	-35.2
73	-34.8
74	-34.4
75	-34.0
76	-33.6
77	-33.1
78	-32.7
79	-32.2
80	-31.7
81	-31.3
82	-30.8
83	-30.3
84	-29.8
85	-29.3
86	-28.7
87	-28.2
88	-27.7
89	-27.1
90	-26.5
91	-26.0
92	-25.4
93	-24.8
94	-24.2
95	-23.6
96	-23.0
97	-22.4
98	-21.8
99	-21.2
100	-20.5
101	-19.9
102	-19.3
103	-18.6
104	-17.9
105	-17.3
106	-16.6
107	-15.9
108	-15.3
109	-14.6
110	-13.9
111	-13.2
112	-12.5
113	-11.8
114	-11.1
115	-10.4
116	-9.7
117	-9.0
118	-8.3
119	-7.6
120	-6.8

S♈	Popravka
°	′
120	-6.8
121	-6.1
122	-5.4
123	-4.7
124	-4.0
125	-3.2
126	-2.5
127	-1.8
128	-1.0
129	-0.3
130	0.4
131	1.1
132	1.9
133	2.6
134	3.3
135	4.1
136	4.8
137	5.5
138	6.2
139	7.0
140	7.7
141	8.4
142	9.1
143	9.8
144	10.5
145	11.2
146	11.9
147	12.6
148	13.3
149	14.0
150	14.7
151	15.4
152	16.0
153	16.7
154	17.4
155	18.0
156	18.7
157	19.3
158	20.0
159	20.6
160	21.3
161	21.9
162	22.5
163	23.1
164	23.7
165	24.3
166	24.9
167	25.5
168	26.1
169	26.6
170	27.2
171	27.7
172	28.3
173	28.8
174	29.3
175	29.9
176	30.4
177	30.9
178	31.3
179	31.8
180	32.3

S♈	Popravka
°	′
180	32.3
181	32.7
182	33.2
183	33.6
184	34.1
185	34.5
186	34.9
187	35.3
188	35.7
189	36.0
190	36.4
191	36.8
192	37.1
193	37.4
194	37.8
195	38.1
196	38.4
197	38.6
198	38.9
199	39.2
200	39.4
201	39.7
202	39.9
203	40.1
204	40.3
205	40.5
206	40.7
207	40.8
208	41.0
209	41.1
210	41.2
211	41.3
212	41.4
213	41.5
214	41.6
215	41.7
216	41.7
217	41.8
218	41.8
219	41.8
220	41.8
221	41.8
222	41.8
223	41.7
224	41.7
225	41.6
226	41.5
227	41.4
228	41.3
229	41.2
230	41.1
231	40.9
232	40.8
233	40.6
234	40.5
235	40.3
236	40.1
237	39.8
238	39.6
239	39.4
240	39.1

S♈	Popravka
°	′
240	39.1
241	38.9
242	38.6
243	38.3
244	38.0
245	37.7
246	37.4
247	37.1
248	36.7
249	36.4
250	36.0
251	35.6
252	35.2
253	34.8
254	34.4
255	34.0
256	33.6
257	33.1
258	32.7
259	32.2
260	31.7
261	31.3
262	30.8
263	30.3
264	29.8
265	29.3
266	28.7
267	28.2
268	27.7
269	27.1
270	26.5
271	26.0
272	25.4
273	24.8
274	24.2
275	23.6
276	23.0
277	22.4
278	21.8
279	21.2
280	20.5
281	19.9
282	19.3
283	18.6
284	17.9
285	17.3
286	16.6
287	15.9
288	15.3
289	14.6
290	13.9
291	13.2
292	12.5
293	11.8
294	11.1
295	10.4
296	9.7
297	9.0
298	8.3
299	7.6
300	6.8

S♈	Popravka
°	′
300	6.8
301	6.1
302	5.4
303	4.7
304	4.0
305	3.2
306	2.5
307	1.8
308	1.0
309	0.3
310	-0.4
311	-1.1
312	-1.9
313	-2.6
314	-3.3
315	-4.1
316	-4.8
317	-5.5
318	-6.2
319	-7.0
320	-7.7
321	-8.4
322	-9.1
323	-9.8
324	-10.5
325	-11.2
326	-11.9
327	-12.6
328	-13.3
329	-14.0
330	-14.7
331	-15.4
332	-16.0
333	-16.7
334	-17.4
335	-18.0
336	-18.7
337	-19.3
338	-20.0
339	-20.6
340	-21.3
341	-21.9
342	-22.5
343	-23.1
344	-23.7
345	-24.3
346	-24.9
347	-25.5
348	-26.1
349	-26.6
350	-27.2
351	-27.7
352	-28.3
353	-28.8
354	-29.3
355	-29.9
356	-30.4
357	-30.9
358	-31.3
359	-31.8
360	-32.3

TABLICA II

Sϒ \ φ		0°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	62°	64°	66°	φ \ Sϒ	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	15	1
2	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30	2
3	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45	3
4	60	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	60	4
5	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	75	5
6	90	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	90	6
7	105	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	105	7
8	120	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	120	8
9	135	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	135	9
10	150	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	150	10
11	165	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	165	11
12	180	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	180	12
13	195	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	195	13
14	210	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	210	14
15	225	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	225	15
16	240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	240	16
17	255	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	255	17
18	270	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	270	18
19	285	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	285	19
20	300	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	300	20
21	315	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	315	21
22	330	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	330	22
23	345	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	345	23
24	360	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	360	24

TABLICA III

Sϒ \ Datum		2008 1. JAN	1. FEB	1. MAR	1. APR	1. MAJ	1. JUN	1. JUL	1. AVG	1. SEP	1. OKT	1. NOV	1. DEC	2009 1. JAN	Datum \ Sϒ	
h	°	′	′	′	′	′	′	′	′	′	′	′	′	′	°	h
1	15	-.1	-.2	-.2	-.1	.0	.1	.3	.3	.2	.1	.0	-.1	-.3	15	1
2	30	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.2	.1	-.1	-.2	-.4	30	2
3	45	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.2	.1	-.1	-.2	-.4	45	3
4	60	-.1	-.2	-.2	-.1	.1	.2	.3	.3	.2	.1	-.1	-.2	-.4	60	4
5	75	-.1	-.1	-.1	.0	.1	.2	.3	.2	.1	.0	-.1	-.2	-.4	75	5
6	90	-.1	-.1	-.1	.0	.1	.2	.2	.2	.1	.0	-.1	-.2	-.3	90	6
7	105	-.1	-.1	.0	.0	.1	.2	.2	.1	.0	.0	-.1	-.2	-.2	105	7
8	120	.0	.0	.0	.1	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	120	8
9	135	.0	.0	.1	.1	.1	.1	.0	.0	-.1	-.1	-.1	-.1	.0	135	9
10	150	.0	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	-.1	.0	.1	150	10
11	165	.0	.1	.2	.1	.0	.0	-.1	-.2	-.1	-.1	.0	.0	.2	165	11
12	180	.1	.2	.2	.1	.0	-.1	-.2	-.2	-.2	-.1	.0	.1	.3	180	12
13	195	.1	.2	.2	.1	.0	-.1	-.3	-.3	-.2	-.1	.0	.1	.3	195	13
14	210	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	210	14
15	225	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	225	15
16	240	.1	.2	.2	.1	-.1	-.2	-.3	-.3	-.2	-.1	.1	.2	.4	240	16
17	255	.1	.1	.1	.0	-.1	-.2	-.3	-.2	-.1	.0	.1	.2	.4	255	17
18	270	.1	.1	.1	.0	-.1	-.2	-.2	-.2	-.1	.0	.1	.2	.3	270	18
19	285	.1	.1	.0	.0	-.1	-.2	-.2	-.1	.0	.0	.1	.2	.2	285	19
20	300	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	300	20
21	315	.0	.0	-.1	-.1	-.1	-.1	.0	.0	.1	.1	.1	.1	.0	315	21
22	330	.0	-.1	-.1	-.1	-.1	.0	.1	.1	.1	.1	.1	.0	-.1	330	22
23	345	.0	-.1	-.2	-.1	.0	.0	.1	.2	.1	.1	.0	.0	-.2	345	23
24	360	-.1	-.2	-.2	-.1	.0	.1	.2	.2	.2	.1	.0	-.1	-.3	360	24

AZIMUTI SEVERNJAČE

$s\gamma$ \ φ	0°	30°	40°	50°	55°	60°	65°	70°	75°	$+\varphi = \nu$
°	°	°	°	°	°	°	°	°	°	°
0	0.5	0.5	0.6	0.7	0.8	1.0	1.1	1.4	1.9	0
15	0.3	0.4	0.4	0.5	0.6	0.6	0.8	0.9	1.3	15
30	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	30
45	359.9	359.9	359.9	359.9	359.9	359.9	359.9	359.8	359.8	45
60	359.8	359.7	359.7	359.6	359.6	359.5	359.4	359.3	359.0	60
75	359.6	359.5	359.5	359.4	359.3	359.2	359.0	358.8	358.3	75
90	359.4	359.4	359.3	359.1	359.0	358.9	358.7	358.3	357.8	90
105	359.3	359.2	359.1	359.0	358.8	358.7	358.4	358.1	357.4	105
120	359.3	359.2	359.1	358.9	358.8	358.6	358.3	357.9	357.2	120
135	359.3	359.2	359.1	358.9	358.7	358.6	358.3	357.9	357.2	135
150	359.3	359.2	359.1	358.9	358.8	358.6	358.4	358.0	357.4	150
165	359.4	359.3	359.2	359.1	359.0	358.8	358.6	358.3	357.8	165
180	359.5	359.5	359.4	359.3	359.2	359.1	358.9	358.7	358.2	180
195	359.7	359.6	359.6	359.5	359.5	359.4	359.3	359.1	358.8	195
210	359.9	359.8	359.8	359.8	359.8	359.7	359.7	359.6	359.5	210
225	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	225
240	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.9	240
255	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.2	1.5	255
270	0.6	0.6	0.7	0.9	1.0	1.1	1.3	1.6	2.1	270
285	0.7	0.8	0.9	1.0	1.1	1.3	1.5	1.9	2.5	285
300	0.7	0.8	0.9	1.1	1.2	1.4	1.7	2.1	2.7	300
315	0.7	0.8	0.9	1.1	1.3	1.4	1.7	2.1	2.8	315
330	0.7	0.8	0.9	1.1	1.2	1.4	1.6	2.0	2.7	330
345	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.8	2.4	345
360	0.5	0.5	0.6	0.7	0.8	1.0	1.1	1.4	1.9	360

O B J A Š NJ E NJ E

Poslednja rubrika daje podatak, koji algebarski sabran sa geografskom širinom zbirne pozicije broda daje približnu visinu sa tačnošću od nekoliko lučnih minuta radi njenog prethodnog postavljanja na sekstant u cilju olakšanja rada pri merenju visine Severnjače.

⋆ ★ ★ ★ ⋆

Interpolacione

I

POMOĆNE TABLICE

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Meseca

za $\varphi = 0°$ do $\pm 30°$									
$\Delta\varphi$ / Δt_s	1°	2°	3°	4°	5°	6°	7°	8°	9°
1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
2	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8
3	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7
4	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6
5	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4
7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3
8	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2
9	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1
10	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
11	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9
12	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
13	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7
14	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6
15	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5
16	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4
17	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3
18	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2
19	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1
20	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0
21	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9
22	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8
23	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7
24	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6
25	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5
26	2.6	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4
27	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3
28	2.8	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2
29	2.9	5.8	8.7	11.6	14.5	17.4	20.3	23.2	26.1
30	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0
31	3.1	6.2	9.3	12.4	15.5	18.6	21.7	24.8	27.9
32	3.2	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8
33	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7
34	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6
35	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0	31.5
36	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4
37	3.7	7.4	11.1	14.8	18.5	22.2	25.9	29.6	33.3
38	3.8	7.6	11.4	15.2	19.0	22.8	26.6	30.4	34.2
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0

za $\varphi = 0°$ do $\pm 30°$										
0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	$\Delta\varphi$ / Δt_s
0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	1
0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	2
0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	3
0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	4
0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	5
0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	6
0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	7
0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	8
0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	10
0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	11
0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	12
0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.0	1.2	13
0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	14
0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	15
0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	16
0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.5	17
0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	18
0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.7	19
0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	20
0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	21
0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	22
0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.8	2.1	23
0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	24
0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	25
0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	26
0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.4	27
0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	28
0.3	0.6	0.9	1.2	1.5	1.7	2.0	2.3	2.6	29
0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	30
0.3	0.6	0.9	1.2	1.6	1.9	2.2	2.5	2.8	31
0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	32
0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.6	3.0	33
0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	34
0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	35
0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	36
0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0	3.3	37
0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	38
0.4	0.8	1.2	1.6	2.0	2.3	2.7	3.1	3.5	39
0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	40
0.4	0.8	1.2	1.6	2.1	2.5	2.9	3.3	3.7	41
0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	42
0.4	0.9	1.3	1.7	2.2	2.6	3.0	3.4	3.9	43
0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	44
0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	45
0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	46
0.5	0.9	1.4	1.9	2.4	2.8	3.3	3.8	4.2	47
0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	48
0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	49
0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	50
0.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	51
0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	52
0.5	1.1	1.6	2.1	2.7	3.2	3.7	4.2	4.8	53
0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	54
0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	55
0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	56
0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.1	57
0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	58
0.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7	5.3	59
0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	60

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza i zalaza Sunca i Meseca

za $\varphi = \pm(30^\circ$ do $60^\circ)$											
Δt_s \ $\Delta\varphi$	1°	2°	3°	4°	0°.1	0°.2	0°.3	0°.4	0°.5	0°.6	0°.7	0°.8	0°.9	Δt_s \ $\Delta\varphi$
1	0.2	0.4	0.6	0.8	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1
2	0.4	0.8	1.2	1.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	2
3	0.6	1.2	1.8	2.4	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	3
4	0.8	1.6	2.4	3.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	4
5	1.0	2.0	3.0	4.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	5
6	1.2	2.4	3.6	4.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	6
7	1.4	2.8	4.2	5.6	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	7
8	1.6	3.2	4.8	6.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	8
9	1.8	3.6	5.4	7.2	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	9
10	2.0	4.0	6.0	8.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	10
11	2.2	4.4	6.6	8.8	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	11
12	2.4	4.8	7.2	9.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	12
13	2.6	5.2	7.8	10.4	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	13
14	2.8	5.6	8.4	11.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	14
15	3.0	6.0	9.0	12.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	15
16	3.2	6.4	9.6	12.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	16
17	3.4	6.8	10.2	13.6	0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	17
18	3.6	7.2	10.8	14.4	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	18
19	3.8	7.6	11.4	15.2	0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	19
20	4.0	8.0	12.0	16.0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	20
21	4.2	8.4	12.6	16.8	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	21
22	4.4	8.8	13.2	17.6	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	22
23	4.6	9.2	13.8	18.4	0.5	0.9	1.4	1.8	2.3	2.8	3.2	3.7	4.1	23
24	4.8	9.6	14.4	19.2	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	24
25	5.0	10.0	15.0	20.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	25
26	5.2	10.4	15.6	20.8	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	26
27	5.4	10.8	16.2	21.6	0.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	27
28	5.6	11.2	16.8	22.4	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	28
29	5.8	11.6	17.4	23.2	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	29
30	6.0	12.0	18.0	24.0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	30
31	6.2	12.4	18.6	24.8	0.6	1.2	1.9	2.5	3.1	3.7	4.3	5.0	5.6	31
32	6.4	12.8	19.2	25.6	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	32
33	6.6	13.2	19.8	26.4	0.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	33
34	6.8	13.6	20.4	27.2	0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	34
35	7.0	14.0	21.0	28.0	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	35
36	7.2	14.4	21.6	28.8	0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	36
37	7.4	14.8	22.2	29.6	0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9	6.7	37
38	7.6	15.2	22.8	30.4	0.8	1.5	2.3	3.0	3.8	4.6	5.3	6.1	6.8	38
39	7.8	15.6	23.4	31.2	0.8	1.6	2.3	3.1	3.9	4.7	5.5	6.2	7.0	39
40	8.0	16.0	24.0	32.0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	40
41	8.2	16.4	24.6	32.8	0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	41
42	8.4	16.8	25.2	33.6	0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	42
43	8.6	17.2	25.8	34.4	0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	43
44	8.8	17.6	26.4	35.2	0.9	1.8	2.6	3.5	4.4	5.3	6.2	7.0	7.9	44
45	9.0	18.0	27.0	36.0	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	45
46	9.2	18.4	27.6	36.8	0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	46
47	9.4	18.8	28.2	37.6	0.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	47
48	9.6	19.2	28.8	38.4	1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.6	48
49	9.8	19.6	29.4	39.2	1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	49
50	10.0	20.0	30.0	40.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	50
51	10.2	20.4	30.6	40.8	1.0	2.0	3.1	4.1	5.1	6.1	7.1	8.2	9.2	51
52	10.4	20.8	31.2	41.6	1.0	2.1	3.1	4.2	5.2	6.2	7.3	8.3	9.4	52
53	10.6	21.2	31.8	42.4	1.1	2.1	3.2	4.2	5.3	6.4	7.4	8.5	9.5	53
54	10.8	21.6	32.4	43.2	1.1	2.2	3.2	4.3	5.4	6.5	7.6	8.6	9.7	54
55	11.0	22.0	33.0	44.0	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	55
56	11.2	22.4	33.6	44.8	1.1	2.2	3.4	4.5	5.6	6.7	7.8	9.0	10.1	56
57	11.4	22.8	34.2	45.6	1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	57
58	11.6	23.2	34.8	46.4	1.2	2.3	3.5	4.6	5.8	7.0	8.1	9.3	10.4	58
59	11.8	23.6	35.4	47.2	1.2	2.4	3.5	4.7	5.9	7.1	8.3	9.4	10.6	59
60	12.0	24.0	36.0	48.0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	60

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan

$\frac{\Delta}{24}$ \ λ	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	$\frac{\Delta}{24}$ \ λ
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2
0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3
0.4	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4
0.5	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.5
0.6	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.6
0.7	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.7
0.8	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1	0.8
0.9	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	0.9
1.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.0
1.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.1
1.2	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.2
1.3	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.3
1.4	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.4
1.5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	1.5
1.6	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.6
1.7	0.1	0.2	0.3	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.3	1.7
1.8	0.1	0.2	0.4	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	1.8
1.9	0.1	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4	2.5	1.9
2.0	0.1	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.0
2.1	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	2.1
2.2	0.1	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9	2.1	2.2	2.3	2.5	2.6	2.8	2.9	2.2
2.3	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.5	2.6	2.8	2.9	3.1	2.3
2.4	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.4	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.0	3.2	2.4
2.5	0.2	0.3	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	2.5
2.6	0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.6	2.8	2.9	3.1	3.3	3.5	2.6
2.7	0.2	0.4	0.5	0.7	0.9	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	3.1	3.2	3.4	3.6	2.7
2.8	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.5	3.7	2.8
2.9	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	2.9
3.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	3.0
3.1	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	3.1
3.2	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	3.2
3.3	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	3.3
3.4	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.5	2.7	2.9	3.2	3.4	3.6	3.9	4.1	4.3	4.5	3.4
3.5	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	3.5
3.6	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	3.6
3.7	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.7	4.9	3.7
3.8	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.1	4.3	4.6	4.8	5.1	3.8
3.9	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.4	4.7	4.9	5.2	3.9
4.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3	4.0
4.1	0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.6	4.9	5.2	5.5	4.1
4.2	0.3	0.6	0.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.6	4.2
4.3	0.3	0.6	0.9	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.4	5.7	4.3
4.4	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	4.4
4.5	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	4.5
4.6	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	4.6
4.7	0.3	0.6	0.9	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.8	4.1	4.4	4.7	5.0	5.3	5.6	6.0	6.3	4.7
4.8	0.3	0.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.1	5.4	5.8	6.1	6.4	4.8
4.9	0.3	0.7	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.2	4.6	4.9	5.2	5.6	5.9	6.2	6.5	4.9
5.0	0.3	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7	5.0

INTERPOLACIONA TABLICA

za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan

$\frac{\Delta}{24}$ \ λ	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°	160°	170°	180°	$\frac{\Delta}{24}$ \ λ
0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	0.1
0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	0.2
0.3	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	0.3
0.4	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	0.4
0.5	0.7	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	0.5
0.6	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	0.6
0.7	0.9	1.4	1.9	2.3	2.8	3.3	3.7	4.2	4.7	5.1	5.6	6.1	6.5	7.0	7.5	7.9	8.4	0.7
0.8	1.1	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.3	5.9	6.4	6.9	7.5	8.0	8.5	9.1	9.6	0.8
0.9	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	0.9
1.0	1.3	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	1.0
1.1	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.6	7.3	8.1	8.8	9.5	10.3	11.0	11.7	12.5	13.2	1.1
1.2	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	1.2
1.3	1.7	2.6	3.5	4.3	5.2	6.1	6.9	7.8	8.7	9.5	10.4	11.3	12.1	13.0	13.9	14.7	15.6	1.3
1.4	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14.0	14.9	15.9	16.8	1.4
1.5	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	1.5
1.6	2.1	3.2	4.3	5.3	6.4	7.5	8.5	9.6	10.7	11.7	12.8	13.9	14.9	16.0	17.1	18.1	19.2	1.6
1.7	2.3	3.4	4.5	5.7	6.8	7.9	9.1	10.2	11.3	12.5	13.6	14.7	15.9	17.0	18.1	19.3	20.4	1.7
1.8	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	1.8
1.9	2.5	3.8	5.1	6.3	7.6	8.9	10.1	11.4	12.7	13.9	15.2	16.5	17.7	19.0	20.3	21.5	22.8	1.9
2.0	2.7	4.0	5.3	6.7	8.0	9.3	10.7	12.0	13.3	14.7	16.0	17.3	18.7	20.0	21.3	22.7	24.0	2.0
2.1	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	2.1
2.2	2.9	4.4	5.9	7.3	8.8	10.3	11.7	13.2	14.7	16.1	17.6	19.1	20.5	22.0	23.5	24.9	26.4	2.2
2.3	3.1	4.6	6.1	7.7	9.2	10.7	12.3	13.8	15.3	16.9	18.4	19.9	21.5	23.0	24.5	26.1	27.6	2.3
2.4	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0	17.6	19.2	20.8	22.4	24.0	25.6	27.2	28.8	2.4
2.5	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0	21.7	23.3	25.0	26.7	28.3	30.0	2.5
2.6	3.5	5.2	6.9	8.7	10.4	12.1	13.9	15.6	17.3	19.1	20.8	22.5	24.3	26.0	27.7	29.5	31.2	2.6
2.7	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0	19.8	21.6	23.4	25.2	27.0	28.8	30.6	32.4	2.7
2.8	3.7	5.6	7.5	9.3	11.2	13.1	14.9	16.8	18.7	20.5	22.4	24.3	26.1	28.0	29.9	31.7	33.6	2.8
2.9	3.9	5.8	7.7	9.7	11.6	13.5	15.5	17.4	19.3	21.3	23.2	25.1	27.1	29.0	30.9	32.9	34.8	2.9
3.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	3.0
3.1	4.1	6.2	8.3	10.3	12.4	14.5	16.5	18.6	20.7	22.7	24.8	26.9	28.9	31.0	33.1	35.1	37.2	3.1
3.2	4.3	6.4	8.5	10.7	12.8	14.9	17.1	19.2	21.3	23.5	25.6	27.7	29.9	32.0	34.1	36.3	38.4	3.2
3.3	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0	24.2	26.4	28.6	30.8	33.0	35.2	37.4	39.6	3.3
3.4	4.5	6.8	9.1	11.3	13.6	15.9	18.1	20.4	22.7	24.9	27.2	29.5	31.7	34.0	36.3	38.5	40.8	3.4
3.5	4.7	7.0	9.3	11.7	14.0	16.3	18.7	21.0	23.3	25.7	28.0	30.3	32.7	35.0	37.3	39.7	42.0	3.5
3.6	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0	26.4	28.8	31.2	33.6	36.0	38.4	40.8	43.2	3.6
3.7	4.9	7.4	9.9	12.3	14.8	17.3	19.7	22.2	24.7	27.1	29.6	32.1	34.5	37.0	39.5	41.9	44.4	3.7
3.8	5.1	7.6	10.1	12.7	15.2	17.7	20.3	22.8	25.3	27.9	30.4	32.9	35.5	38.0	40.5	43.1	45.6	3.8
3.9	5.2	7.8	10.4	13.0	15.6	18.2	20.8	23.4	26.0	28.6	31.2	33.8	36.4	39.0	41.6	44.2	46.8	3.9
4.0	5.3	8.0	10.7	13.3	16.0	18.7	21.3	24.0	26.7	29.3	32.0	34.7	37.3	40.0	42.7	45.3	48.0	4.0
4.1	5.5	8.2	10.9	13.7	16.4	19.1	21.9	24.6	27.3	30.1	32.8	35.5	38.3	41.0	43.7	46.5	49.2	4.1
4.2	5.6	8.4	11.2	14.0	16.8	19.6	22.4	25.2	28.0	30.8	33.6	36.4	39.2	42.0	44.8	47.6	50.4	4.2
4.3	5.7	8.6	11.5	14.3	17.2	20.1	22.9	25.8	28.7	31.5	34.4	37.3	40.1	43.0	45.9	48.7	51.6	4.3
4.4	5.9	8.8	11.7	14.7	17.6	20.5	23.5	26.4	29.3	32.3	35.2	38.1	41.1	44.0	46.9	49.9	52.8	4.4
4.5	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	4.5
4.6	6.1	9.2	12.3	15.3	18.4	21.5	24.5	27.6	30.7	33.7	36.8	39.9	42.9	46.0	49.1	52.1	55.2	4.6
4.7	6.3	9.4	12.5	15.7	18.8	21.9	25.1	28.2	31.3	34.5	37.6	40.7	43.9	47.0	50.1	53.3	56.4	4.7
4.8	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8	32.0	35.2	38.4	41.6	44.8	48.0	51.2	54.4	57.6	4.8
4.9	6.5	9.8	13.1	16.3	19.6	22.9	26.1	29.4	32.7	35.9	39.2	42.5	45.7	49.0	52.3	55.5	58.8	4.9
5.0	6.7	10.0	13.3	16.7	20.0	23.3	26.7	30.0	33.3	36.7	40.0	43.3	46.7	50.0	53.3	56.7	60.0	5.0

⋆ ★ ★ ★ ⋆

$I_n$terpolaciona tablica

ZA

POPRAVKU ČASOVNOG UGLA I DEKLINACIJE

0 h 0 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 .0	0 .0	0 .0	0	.0	60	.1	120	.1
1	0 .3	0 .3	0 .2	1	.0	61	.1	121	.1
2	0 .5	0 .5	0 .5	2	.0	62	.1	122	.1
3	0 .8	0 .8	0 .7	3	.0	63	.1	123	.1
4	0 1.0	0 1.0	0 1.0	4	.0	64	.1	124	.1
5	0 1.3	0 1.3	0 1.2	5	.0	65	.1	125	.1
6	0 1.5	0 1.5	0 1.4	6	.0	66	.1	126	.1
7	0 1.8	0 1.8	0 1.7	7	.0	67	.1	127	.1
8	0 2.0	0 2.0	0 1.9	8	.0	68	.1	128	.1
9	0 2.3	0 2.3	0 2.1	9	.0	69	.1	129	.1
10	0 2.5	0 2.5	0 2.4	10	.0	70	.1	130	.1
11	0 2.8	0 2.8	0 2.6	11	.0	71	.1	131	.1
12	0 3.0	0 3.0	0 2.9	12	.0	72	.1	132	.1
13	0 3.3	0 3.3	0 3.1	13	.0	73	.1	133	.1
14	0 3.5	0 3.5	0 3.3	14	.0	74	.1	134	.1
15	0 3.8	0 3.8	0 3.6	15	.0	75	.1	135	.1
16	0 4.0	0 4.0	0 3.8	16	.0	76	.1	136	.1
17	0 4.3	0 4.3	0 4.1	17	.0	77	.1	137	.1
18	0 4.5	0 4.5	0 4.3	18	.0	78	.1	138	.1
19	0 4.8	0 4.8	0 4.5	19	.0	79	.1	139	.1
20	0 5.0	0 5.0	0 4.8	20	.0	80	.1	140	.1
21	0 5.3	0 5.3	0 5.0	21	.0	81	.1	141	.1
22	0 5.5	0 5.5	0 5.2	22	.0	82	.1	142	.1
23	0 5.8	0 5.8	0 5.5	23	.0	83	.1	143	.1
24	0 6.0	0 6.0	0 5.7	24	.0	84	.1	144	.1
25	0 6.3	0 6.3	0 6.0	25	.0	85	.1	145	.1
26	0 6.5	0 6.5	0 6.2	26	.0	86	.1	146	.1
27	0 6.8	0 6.8	0 6.4	27	.0	87	.1	147	.1
28	0 7.0	0 7.0	0 6.7	28	.0	88	.1	148	.1
29	0 7.3	0 7.3	0 6.9	29	.0	89	.1	149	.1
30	0 7.5	0 7.5	0 7.2	30	.0	90	.1	150	.1
31	0 7.8	0 7.8	0 7.4	31	.0	91	.1	151	.1
32	0 8.0	0 8.0	0 7.6	32	.0	92	.1	152	.1
33	0 8.3	0 8.3	0 7.9	33	.0	93	.1	153	.1
34	0 8.5	0 8.5	0 8.1	34	.0	94	.1	154	.1
35	0 8.8	0 8.8	0 8.4	35	.0	95	.1	155	.1
36	0 9.0	0 9.0	0 8.6	36	.0	96	.1	156	.1
37	0 9.3	0 9.3	0 8.8	37	.0	97	.1	157	.1
38	0 9.5	0 9.5	0 9.1	38	.0	98	.1	158	.1
39	0 9.8	0 9.8	0 9.3	39	.0	99	.1	159	.1
40	0 10.0	0 10.0	0 9.5	40	.0	100	.1	160	.1
41	0 10.3	0 10.3	0 9.8	41	.0	101	.1	161	.1
42	0 10.5	0 10.5	0 10.0	42	.0	102	.1	162	.1
43	0 10.8	0 10.8	0 10.3	43	.0	103	.1	163	.1
44	0 11.0	0 11.0	0 10.5	44	.0	104	.1	164	.1
45	0 11.3	0 11.3	0 10.7	45	.0	105	.1	165	.1
46	0 11.5	0 11.5	0 11.0	46	.0	106	.1	166	.1
47	0 11.8	0 11.8	0 11.2	47	.0	107	.1	167	.1
48	0 12.0	0 12.0	0 11.5	48	.0	108	.1	168	.1
49	0 12.3	0 12.3	0 11.7	49	.0	109	.1	169	.1
50	0 12.5	0 12.5	0 11.9	50	.0	110	.1	170	.1
51	0 12.8	0 12.8	0 12.2	51	.0	111	.1	171	.1
52	0 13.0	0 13.0	0 12.4	52	.0	112	.1	172	.1
53	0 13.3	0 13.3	0 12.6	53	.0	113	.1	173	.1
54	0 13.5	0 13.5	0 12.9	54	.0	114	.1	174	.1
55	0 13.8	0 13.8	0 13.1	55	.0	115	.1	175	.1
56	0 14.0	0 14.0	0 13.4	56	.0	116	.1	176	.1
57	0 14.3	0 14.3	0 13.6	57	.0	117	.1	177	.1
58	0 14.5	0 14.5	0 13.8	58	.0	118	.1	178	.1
59	0 14.8	0 14.8	0 14.1	59	.0	119	.1	179	.1
60	0 15.0	0 15.0	0 14.3	60	.1	120	.1	180	.2

0 h 1 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 15.0	0 15.0	0 14.3	0	.0	60	.2	120	.3
1	0 15.3	0 15.3	0 14.6	1	.0	61	.2	121	.3
2	0 15.5	0 15.5	0 14.8	2	.0	62	.2	122	.3
3	0 15.8	0 15.8	0 15.0	3	.0	63	.2	123	.3
4	0 16.0	0 16.0	0 15.3	4	.0	64	.2	124	.3
5	0 16.3	0 16.3	0 15.5	5	.0	65	.2	125	.3
6	0 16.5	0 16.5	0 15.7	6	.0	66	.2	126	.3
7	0 16.8	0 16.8	0 16.0	7	.0	67	.2	127	.3
8	0 17.0	0 17.0	0 16.2	8	.0	68	.2	128	.3
9	0 17.3	0 17.3	0 16.5	9	.0	69	.2	129	.3
10	0 17.5	0 17.5	0 16.7	10	.0	70	.2	130	.3
11	0 17.8	0 17.8	0 16.9	11	.0	71	.2	131	.3
12	0 18.0	0 18.1	0 17.2	12	.0	72	.2	132	.3
13	0 18.3	0 18.3	0 17.4	13	.0	73	.2	133	.3
14	0 18.5	0 18.6	0 17.7	14	.0	74	.2	134	.3
15	0 18.8	0 18.8	0 17.9	15	.0	75	.2	135	.3
16	0 19.0	0 19.1	0 18.1	16	.0	76	.2	136	.3
17	0 19.3	0 19.3	0 18.4	17	.0	77	.2	137	.3
18	0 19.5	0 19.6	0 18.6	18	.0	78	.2	138	.3
19	0 19.8	0 19.8	0 18.9	19	.0	79	.2	139	.3
20	0 20.0	0 20.1	0 19.1	20	.1	80	.2	140	.4
21	0 20.3	0 20.3	0 19.3	21	.1	81	.2	141	.4
22	0 20.5	0 20.6	0 19.6	22	.1	82	.2	142	.4
23	0 20.8	0 20.8	0 19.8	23	.1	83	.2	143	.4
24	0 21.0	0 21.1	0 20.0	24	.1	84	.2	144	.4
25	0 21.3	0 21.3	0 20.3	25	.1	85	.2	145	.4
26	0 21.5	0 21.6	0 20.5	26	.1	86	.2	146	.4
27	0 21.8	0 21.8	0 20.8	27	.1	87	.2	147	.4
28	0 22.0	0 22.1	0 21.0	28	.1	88	.2	148	.4
29	0 22.3	0 22.3	0 21.2	29	.1	89	.2	149	.4
30	0 22.5	0 22.6	0 21.5	30	.1	90	.2	150	.4
31	0 22.8	0 22.8	0 21.7	31	.1	91	.2	151	.4
32	0 23.0	0 23.1	0 22.0	32	.1	92	.2	152	.4
33	0 23.3	0 23.3	0 22.2	33	.1	93	.2	153	.4
34	0 23.5	0 23.6	0 22.4	34	.1	94	.2	154	.4
35	0 23.8	0 23.8	0 22.7	35	.1	95	.2	155	.4
36	0 24.0	0 24.1	0 22.9	36	.1	96	.2	156	.4
37	0 24.3	0 24.3	0 23.1	37	.1	97	.2	157	.4
38	0 24.5	0 24.6	0 23.4	38	.1	98	.2	158	.4
39	0 24.8	0 24.8	0 23.6	39	.1	99	.2	159	.4
40	0 25.0	0 25.1	0 23.9	40	.1	100	.3	160	.4
41	0 25.3	0 25.3	0 24.1	41	.1	101	.3	161	.4
42	0 25.5	0 25.6	0 24.3	42	.1	102	.3	162	.4
43	0 25.8	0 25.8	0 24.6	43	.1	103	.3	163	.4
44	0 26.0	0 26.1	0 24.8	44	.1	104	.3	164	.4
45	0 26.3	0 26.3	0 25.1	45	.1	105	.3	165	.4
46	0 26.5	0 26.6	0 25.3	46	.1	106	.3	166	.4
47	0 26.8	0 26.8	0 25.5	47	.1	107	.3	167	.4
48	0 27.0	0 27.1	0 25.8	48	.1	108	.3	168	.4
49	0 27.3	0 27.3	0 26.0	49	.1	109	.3	169	.4
50	0 27.5	0 27.6	0 26.2	50	.1	110	.3	170	.4
51	0 27.8	0 27.8	0 26.5	51	.1	111	.3	171	.4
52	0 28.0	0 28.1	0 26.7	52	.1	112	.3	172	.4
53	0 28.3	0 28.3	0 27.0	53	.1	113	.3	173	.4
54	0 28.5	0 28.6	0 27.2	54	.1	114	.3	174	.4
55	0 28.8	0 28.8	0 27.4	55	.1	115	.3	175	.4
56	0 29.0	0 29.1	0 27.7	56	.1	116	.3	176	.4
57	0 29.3	0 29.3	0 27.9	57	.1	117	.3	177	.4
58	0 29.5	0 29.6	0 28.2	58	.1	118	.3	178	.4
59	0 29.8	0 29.8	0 28.4	59	.1	119	.3	179	.4
60	0 30.0	0 30.1	0 28.6	60	.2	120	.3	180	.5

0 h 2 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 30.0	0 30.1	0 28.6	0	.0	60	.3	120	.5
1	0 30.3	0 30.3	0 28.9	1	.0	61	.3	121	.5
2	0 30.5	0 30.6	0 29.1	2	.0	62	.3	122	.5
3	0 30.8	0 30.8	0 29.3	3	.0	63	.3	123	.5
4	0 31.0	0 31.1	0 29.6	4	.0	64	.3	124	.5
5	0 31.3	0 31.3	0 29.8	5	.0	65	.3	125	.5
6	0 31.5	0 31.6	0 30.1	6	.0	66	.3	126	.5
7	0 31.8	0 31.8	0 30.3	7	.0	67	.3	127	.5
8	0 32.0	0 32.1	0 30.5	8	.0	68	.3	128	.5
9	0 32.3	0 32.3	0 30.8	9	.0	69	.3	129	.5
10	0 32.5	0 32.6	0 31.0	10	.0	70	.3	130	.5
11	0 32.8	0 32.8	0 31.3	11	.0	71	.3	131	.5
12	0 33.0	0 33.1	0 31.5	12	.1	72	.3	132	.6
13	0 33.3	0 33.3	0 31.7	13	.1	73	.3	133	.6
14	0 33.5	0 33.6	0 32.0	14	.1	74	.3	134	.6
15	0 33.8	0 33.8	0 32.2	15	.1	75	.3	135	.6
16	0 34.0	0 34.1	0 32.5	16	.1	76	.3	136	.6
17	0 34.3	0 34.3	0 32.7	17	.1	77	.3	137	.6
18	0 34.5	0 34.6	0 32.9	18	.1	78	.3	138	.6
19	0 34.8	0 34.8	0 33.2	19	.1	79	.3	139	.6
20	0 35.0	0 35.1	0 33.4	20	.1	80	.3	140	.6
21	0 35.3	0 35.3	0 33.6	21	.1	81	.3	141	.6
22	0 35.5	0 35.6	0 33.9	22	.1	82	.3	142	.6
23	0 35.8	0 35.8	0 34.1	23	.1	83	.3	143	.6
24	0 36.0	0 36.1	0 34.4	24	.1	84	.4	144	.6
25	0 36.3	0 36.4	0 34.6	25	.1	85	.4	145	.6
26	0 36.5	0 36.6	0 34.8	26	.1	86	.4	146	.6
27	0 36.8	0 36.9	0 35.1	27	.1	87	.4	147	.6
28	0 37.0	0 37.1	0 35.3	28	.1	88	.4	148	.6
29	0 37.3	0 37.4	0 35.6	29	.1	89	.4	149	.6
30	0 37.5	0 37.6	0 35.8	30	.1	90	.4	150	.6
31	0 37.8	0 37.9	0 36.0	31	.1	91	.4	151	.6
32	0 38.0	0 38.1	0 36.3	32	.1	92	.4	152	.6
33	0 38.3	0 38.4	0 36.5	33	.1	93	.4	153	.6
34	0 38.5	0 38.6	0 36.7	34	.1	94	.4	154	.6
35	0 38.8	0 38.9	0 37.0	35	.1	95	.4	155	.6
36	0 39.0	0 39.1	0 37.2	36	.2	96	.4	156	.7
37	0 39.3	0 39.4	0 37.5	37	.2	97	.4	157	.7
38	0 39.5	0 39.6	0 37.7	38	.2	98	.4	158	.7
39	0 39.8	0 39.9	0 37.9	39	.2	99	.4	159	.7
40	0 40.0	0 40.1	0 38.2	40	.2	100	.4	160	.7
41	0 40.3	0 40.4	0 38.4	41	.2	101	.4	161	.7
42	0 40.5	0 40.6	0 38.7	42	.2	102	.4	162	.7
43	0 40.8	0 40.9	0 38.9	43	.2	103	.4	163	.7
44	0 41.0	0 41.1	0 39.1	44	.2	104	.4	164	.7
45	0 41.3	0 41.4	0 39.4	45	.2	105	.4	165	.7
46	0 41.5	0 41.6	0 39.6	46	.2	106	.4	166	.7
47	0 41.8	0 41.9	0 39.8	47	.2	107	.4	167	.7
48	0 42.0	0 42.1	0 40.1	48	.2	108	.5	168	.7
49	0 42.3	0 42.4	0 40.3	49	.2	109	.5	169	.7
50	0 42.5	0 42.6	0 40.6	50	.2	110	.5	170	.7
51	0 42.8	0 42.9	0 40.8	51	.2	111	.5	171	.7
52	0 43.0	0 43.1	0 41.0	52	.2	112	.5	172	.7
53	0 43.3	0 43.4	0 41.3	53	.2	113	.5	173	.7
54	0 43.5	0 43.6	0 41.5	54	.2	114	.5	174	.7
55	0 43.8	0 43.9	0 41.8	55	.2	115	.5	175	.7
56	0 44.0	0 44.1	0 42.0	56	.2	116	.5	176	.7
57	0 44.3	0 44.4	0 42.2	57	.2	117	.5	177	.7
58	0 44.5	0 44.6	0 42.5	58	.2	118	.5	178	.7
59	0 44.8	0 44.9	0 42.7	59	.2	119	.5	179	.7
60	0 45.0	0 45.1	0 43.0	60	.3	120	.5	180	.8

0 h 3 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	0 45.0	0 45.1	0 43.0	0	.0	60	.4	120	.7
1	0 45.3	0 45.4	0 43.2	1	.0	61	.4	121	.7
2	0 45.5	0 45.6	0 43.4	2	.0	62	.4	122	.7
3	0 45.8	0 45.9	0 43.7	3	.0	63	.4	123	.7
4	0 46.0	0 46.1	0 43.9	4	.0	64	.4	124	.7
5	0 46.3	0 46.4	0 44.1	5	.0	65	.4	125	.7
6	0 46.5	0 46.6	0 44.4	6	.0	66	.4	126	.7
7	0 46.8	0 46.9	0 44.6	7	.0	67	.4	127	.7
8	0 47.0	0 47.1	0 44.9	8	.0	68	.4	128	.7
9	0 47.3	0 47.4	0 45.1	9	.1	69	.4	129	.8
10	0 47.5	0 47.6	0 45.3	10	.1	70	.4	130	.8
11	0 47.8	0 47.9	0 45.6	11	.1	71	.4	131	.8
12	0 48.0	0 48.1	0 45.8	12	.1	72	.4	132	.8
13	0 48.3	0 48.4	0 46.1	13	.1	73	.4	133	.8
14	0 48.5	0 48.6	0 46.3	14	.1	74	.4	134	.8
15	0 48.8	0 48.9	0 46.5	15	.1	75	.4	135	.8
16	0 49.0	0 49.1	0 46.8	16	.1	76	.4	136	.8
17	0 49.3	0 49.4	0 47.0	17	.1	77	.4	137	.8
18	0 49.5	0 49.6	0 47.2	18	.1	78	.5	138	.8
19	0 49.8	0 49.9	0 47.5	19	.1	79	.5	139	.8
20	0 50.0	0 50.1	0 47.7	20	.1	80	.5	140	.8
21	0 50.3	0 50.4	0 48.0	21	.1	81	.5	141	.8
22	0 50.5	0 50.6	0 48.2	22	.1	82	.5	142	.8
23	0 50.8	0 50.9	0 48.4	23	.1	83	.5	143	.8
24	0 51.0	0 51.1	0 48.7	24	.1	84	.5	144	.8
25	0 51.3	0 51.4	0 48.9	25	.1	85	.5	145	.8
26	0 51.5	0 51.6	0 49.2	26	.2	86	.5	146	.9
27	0 51.8	0 51.9	0 49.4	27	.2	87	.5	147	.9
28	0 52.0	0 52.1	0 49.6	28	.2	88	.5	148	.9
29	0 52.3	0 52.4	0 49.9	29	.2	89	.5	149	.9
30	0 52.5	0 52.6	0 50.1	30	.2	90	.5	150	.9
31	0 52.8	0 52.9	0 50.3	31	.2	91	.5	151	.9
32	0 53.0	0 53.1	0 50.6	32	.2	92	.5	152	.9
33	0 53.3	0 53.4	0 50.8	33	.2	93	.5	153	.9
34	0 53.5	0 53.6	0 51.1	34	.2	94	.5	154	.9
35	0 53.8	0 53.9	0 51.3	35	.2	95	.6	155	.9
36	0 54.0	0 54.2	0 51.5	36	.2	96	.6	156	.9
37	0 54.3	0 54.4	0 51.8	37	.2	97	.6	157	.9
38	0 54.5	0 54.7	0 52.0	38	.2	98	.6	158	.9
39	0 54.8	0 54.9	0 52.3	39	.2	99	.6	159	.9
40	0 55.0	0 55.2	0 52.5	40	.2	100	.6	160	.9
41	0 55.3	0 55.4	0 52.7	41	.2	101	.6	161	.9
42	0 55.5	0 55.7	0 53.0	42	.2	102	.6	162	.9
43	0 55.8	0 55.9	0 53.2	43	.3	103	.6	163	1.0
44	0 56.0	0 56.2	0 53.4	44	.3	104	.6	164	1.0
45	0 56.3	0 56.4	0 53.7	45	.3	105	.6	165	1.0
46	0 56.5	0 56.7	0 53.9	46	.3	106	.6	166	1.0
47	0 56.8	0 56.9	0 54.2	47	.3	107	.6	167	1.0
48	0 57.0	0 57.2	0 54.4	48	.3	108	.6	168	1.0
49	0 57.3	0 57.4	0 54.6	49	.3	109	.6	169	1.0
50	0 57.5	0 57.7	0 54.9	50	.3	110	.6	170	1.0
51	0 57.8	0 57.9	0 55.1	51	.3	111	.6	171	1.0
52	0 58.0	0 58.2	0 55.4	52	.3	112	.7	172	1.0
53	0 58.3	0 58.4	0 55.6	53	.3	113	.7	173	1.0
54	0 58.5	0 58.7	0 55.8	54	.3	114	.7	174	1.0
55	0 58.8	0 58.9	0 56.1	55	.3	115	.7	175	1.0
56	0 59.0	0 59.2	0 56.3	56	.3	116	.7	176	1.0
57	0 59.3	0 59.4	0 56.6	57	.3	117	.7	177	1.0
58	0 59.5	0 59.7	0 56.8	58	.3	118	.7	178	1.0
59	0 59.8	0 59.9	0 57.0	59	.3	119	.7	179	1.0
60	1 .0	1 .2	0 57.3	60	.4	120	.7	180	1.1

0 h 4 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 .0	1 .2	0 57.3	0	.0	60	.5	120	.9
1	1 .3	1 .4	0 57.5	1	.0	61	.5	121	.9
2	1 .5	1 .7	0 57.7	2	.0	62	.5	122	.9
3	1 .8	1 .9	0 58.0	3	.0	63	.5	123	.9
4	1 1.0	1 1.2	0 58.2	4	.0	64	.5	124	.9
5	1 1.3	1 1.4	0 58.5	5	.0	65	.5	125	.9
6	1 1.5	1 1.7	0 58.7	6	.0	66	.5	126	.9
7	1 1.8	1 1.9	0 58.9	7	.1	67	.5	127	1.0
8	1 2.0	1 2.2	0 59.2	8	.1	68	.5	128	1.0
9	1 2.3	1 2.4	0 59.4	9	.1	69	.5	129	1.0
10	1 2.5	1 2.7	0 59.7	10	.1	70	.5	130	1.0
11	1 2.8	1 2.9	0 59.9	11	.1	71	.5	131	1.0
12	1 3.0	1 3.2	1 .1	12	.1	72	.5	132	1.0
13	1 3.3	1 3.4	1 .4	13	.1	73	.5	133	1.0
14	1 3.5	1 3.7	1 .6	14	.1	74	.6	134	1.0
15	1 3.8	1 3.9	1 .8	15	.1	75	.6	135	1.0
16	1 4.0	1 4.2	1 1.1	16	.1	76	.6	136	1.0
17	1 4.3	1 4.4	1 1.3	17	.1	77	.6	137	1.0
18	1 4.5	1 4.7	1 1.6	18	.1	78	.6	138	1.0
19	1 4.8	1 4.9	1 1.8	19	.1	79	.6	139	1.0
20	1 5.0	1 5.2	1 2.0	20	.2	80	.6	140	1.1
21	1 5.3	1 5.4	1 2.3	21	.2	81	.6	141	1.1
22	1 5.5	1 5.7	1 2.5	22	.2	82	.6	142	1.1
23	1 5.8	1 5.9	1 2.8	23	.2	83	.6	143	1.1
24	1 6.0	1 6.2	1 3.0	24	.2	84	.6	144	1.1
25	1 6.3	1 6.4	1 3.2	25	.2	85	.6	145	1.1
26	1 6.5	1 6.7	1 3.5	26	.2	86	.6	146	1.1
27	1 6.8	1 6.9	1 3.7	27	.2	87	.7	147	1.1
28	1 7.0	1 7.2	1 3.9	28	.2	88	.7	148	1.1
29	1 7.3	1 7.4	1 4.2	29	.2	89	.7	149	1.1
30	1 7.5	1 7.7	1 4.4	30	.2	90	.7	150	1.1
31	1 7.8	1 7.9	1 4.7	31	.2	91	.7	151	1.1
32	1 8.0	1 8.2	1 4.9	32	.2	92	.7	152	1.1
33	1 8.3	1 8.4	1 5.1	33	.2	93	.7	153	1.1
34	1 8.5	1 8.7	1 5.4	34	.3	94	.7	154	1.2
35	1 8.8	1 8.9	1 5.6	35	.3	95	.7	155	1.2
36	1 9.0	1 9.2	1 5.9	36	.3	96	.7	156	1.2
37	1 9.3	1 9.4	1 6.1	37	.3	97	.7	157	1.2
38	1 9.5	1 9.7	1 6.3	38	.3	98	.7	158	1.2
39	1 9.8	1 9.9	1 6.6	39	.3	99	.7	159	1.2
40	1 10.0	1 10.2	1 6.8	40	.3	100	.8	160	1.2
41	1 10.3	1 10.4	1 7.0	41	.3	101	.8	161	1.2
42	1 10.5	1 10.7	1 7.3	42	.3	102	.8	162	1.2
43	1 10.8	1 10.9	1 7.5	43	.3	103	.8	163	1.2
44	1 11.0	1 11.2	1 7.8	44	.3	104	.8	164	1.2
45	1 11.3	1 11.4	1 8.0	45	.3	105	.8	165	1.2
46	1 11.5	1 11.7	1 8.2	46	.3	106	.8	166	1.2
47	1 11.8	1 11.9	1 8.5	47	.4	107	.8	167	1.3
48	1 12.0	1 12.2	1 8.7	48	.4	108	.8	168	1.3
49	1 12.3	1 12.5	1 9.0	49	.4	109	.8	169	1.3
50	1 12.5	1 12.7	1 9.2	50	.4	110	.8	170	1.3
51	1 12.8	1 13.0	1 9.4	51	.4	111	.8	171	1.3
52	1 13.0	1 13.2	1 9.7	52	.4	112	.8	172	1.3
53	1 13.3	1 13.5	1 9.9	53	.4	113	.8	173	1.3
54	1 13.5	1 13.7	1 10.2	54	.4	114	.9	174	1.3
55	1 13.8	1 14.0	1 10.4	55	.4	115	.9	175	1.3
56	1 14.0	1 14.2	1 10.6	56	.4	116	.9	176	1.3
57	1 14.3	1 14.5	1 10.9	57	.4	117	.9	177	1.3
58	1 14.5	1 14.7	1 11.1	58	.4	118	.9	178	1.3
59	1 14.8	1 15.0	1 11.3	59	.4	119	.9	179	1.3
60	1 15.0	1 15.2	1 11.6	60	.5	120	.9	180	1.4

0 h 5 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 15.0	1 15.2	1 11.6	0	.0	60	.6	120	1.1
1	1 15.3	1 15.5	1 11.8	1	.0	61	.6	121	1.1
2	1 15.5	1 15.7	1 12.1	2	.0	62	.6	122	1.1
3	1 15.8	1 16.0	1 12.3	3	.0	63	.6	123	1.1
4	1 16.0	1 16.2	1 12.5	4	.0	64	.6	124	1.1
5	1 16.3	1 16.5	1 12.8	5	.0	65	.6	125	1.1
6	1 16.5	1 16.7	1 13.0	6	.1	66	.6	126	1.2
7	1 16.8	1 17.0	1 13.3	7	.1	67	.6	127	1.2
8	1 17.0	1 17.2	1 13.5	8	.1	68	.6	128	1.2
9	1 17.3	1 17.5	1 13.7	9	.1	69	.6	129	1.2
10	1 17.5	1 17.7	1 14.0	10	.1	70	.6	130	1.2
11	1 17.8	1 18.0	1 14.2	11	.1	71	.7	131	1.2
12	1 18.0	1 18.2	1 14.4	12	.1	72	.7	132	1.2
13	1 18.3	1 18.5	1 14.7	13	.1	73	.7	133	1.2
14	1 18.5	1 18.7	1 14.9	14	.1	74	.7	134	1.2
15	1 18.8	1 19.0	1 15.2	15	.1	75	.7	135	1.2
16	1 19.0	1 19.2	1 15.4	16	.1	76	.7	136	1.2
17	1 19.3	1 19.5	1 15.6	17	.2	77	.7	137	1.3
18	1 19.5	1 19.7	1 15.9	18	.2	78	.7	138	1.3
19	1 19.8	1 20.0	1 16.1	19	.2	79	.7	139	1.3
20	1 20.0	1 20.2	1 16.4	20	.2	80	.7	140	1.3
21	1 20.3	1 20.5	1 16.6	21	.2	81	.7	141	1.3
22	1 20.5	1 20.7	1 16.8	22	.2	82	.8	142	1.3
23	1 20.8	1 21.0	1 17.1	23	.2	83	.8	143	1.3
24	1 21.0	1 21.2	1 17.3	24	.2	84	.8	144	1.3
25	1 21.3	1 21.5	1 17.5	25	.2	85	.8	145	1.3
26	1 21.5	1 21.7	1 17.8	26	.2	86	.8	146	1.3
27	1 21.8	1 22.0	1 18.0	27	.2	87	.8	147	1.3
28	1 22.0	1 22.2	1 18.3	28	.3	88	.8	148	1.4
29	1 22.3	1 22.5	1 18.5	29	.3	89	.8	149	1.4
30	1 22.5	1 22.7	1 18.7	30	.3	90	.8	150	1.4
31	1 22.8	1 23.0	1 19.0	31	.3	91	.8	151	1.4
32	1 23.0	1 23.2	1 19.2	32	.3	92	.8	152	1.4
33	1 23.3	1 23.5	1 19.5	33	.3	93	.9	153	1.4
34	1 23.5	1 23.7	1 19.7	34	.3	94	.9	154	1.4
35	1 23.8	1 24.0	1 19.9	35	.3	95	.9	155	1.4
36	1 24.0	1 24.2	1 20.2	36	.3	96	.9	156	1.4
37	1 24.3	1 24.5	1 20.4	37	.3	97	.9	157	1.4
38	1 24.5	1 24.7	1 20.7	38	.3	98	.9	158	1.4
39	1 24.8	1 25.0	1 20.9	39	.4	99	.9	159	1.5
40	1 25.0	1 25.2	1 21.1	40	.4	100	.9	160	1.5
41	1 25.3	1 25.5	1 21.4	41	.4	101	.9	161	1.5
42	1 25.5	1 25.7	1 21.6	42	.4	102	.9	162	1.5
43	1 25.8	1 26.0	1 21.8	43	.4	103	.9	163	1.5
44	1 26.0	1 26.2	1 22.1	44	.4	104	1.0	164	1.5
45	1 26.3	1 26.5	1 22.3	45	.4	105	1.0	165	1.5
46	1 26.5	1 26.7	1 22.6	46	.4	106	1.0	166	1.5
47	1 26.8	1 27.0	1 22.8	47	.4	107	1.0	167	1.5
48	1 27.0	1 27.2	1 23.0	48	.4	108	1.0	168	1.5
49	1 27.3	1 27.5	1 23.3	49	.4	109	1.0	169	1.5
50	1 27.5	1 27.7	1 23.5	50	.5	110	1.0	170	1.6
51	1 27.8	1 28.0	1 23.8	51	.5	111	1.0	171	1.6
52	1 28.0	1 28.2	1 24.0	52	.5	112	1.0	172	1.6
53	1 28.3	1 28.5	1 24.2	53	.5	113	1.0	173	1.6
54	1 28.5	1 28.7	1 24.5	54	.5	114	1.0	174	1.6
55	1 28.8	1 29.0	1 24.7	55	.5	115	1.1	175	1.6
56	1 29.0	1 29.2	1 24.9	56	.5	116	1.1	176	1.6
57	1 29.3	1 29.5	1 25.2	57	.5	117	1.1	177	1.6
58	1 29.5	1 29.7	1 25.4	58	.5	118	1.1	178	1.6
59	1 29.8	1 30.0	1 25.7	59	.5	119	1.1	179	1.6
60	1 30.0	1 30.3	1 25.9	60	.6	120	1.1	180	1.7

0 h 6 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 30.0	1 30.3	1 25.9	0	.0	60	.7	120	1.3
1	1 30.3	1 30.5	1 26.1	1	.0	61	.7	121	1.3
2	1 30.5	1 30.8	1 26.4	2	.0	62	.7	122	1.3
3	1 30.8	1 31.0	1 26.6	3	.0	63	.7	123	1.3
4	1 31.0	1 31.3	1 26.9	4	.0	64	.7	124	1.3
5	1 31.3	1 31.5	1 27.1	5	.1	65	.7	125	1.4
6	1 31.5	1 31.8	1 27.3	6	.1	66	.7	126	1.4
7	1 31.8	1 32.0	1 27.6	7	.1	67	.7	127	1.4
8	1 32.0	1 32.3	1 27.8	8	.1	68	.7	128	1.4
9	1 32.3	1 32.5	1 28.0	9	.1	69	.7	129	1.4
10	1 32.5	1 32.8	1 28.3	10	.1	70	.8	130	1.4
11	1 32.8	1 33.0	1 28.5	11	.1	71	.8	131	1.4
12	1 33.0	1 33.3	1 28.8	12	.1	72	.8	132	1.4
13	1 33.3	1 33.5	1 29.0	13	.1	73	.8	133	1.4
14	1 33.5	1 33.8	1 29.2	14	.2	74	.8	134	1.5
15	1 33.8	1 34.0	1 29.5	15	.2	75	.8	135	1.5
16	1 34.0	1 34.3	1 29.7	16	.2	76	.8	136	1.5
17	1 34.3	1 34.5	1 30.0	17	.2	77	.8	137	1.5
18	1 34.5	1 34.8	1 30.2	18	.2	78	.8	138	1.5
19	1 34.8	1 35.0	1 30.4	19	.2	79	.9	139	1.5
20	1 35.0	1 35.3	1 30.7	20	.2	80	.9	140	1.5
21	1 35.3	1 35.5	1 30.9	21	.2	81	.9	141	1.5
22	1 35.5	1 35.8	1 31.1	22	.2	82	.9	142	1.5
23	1 35.8	1 36.0	1 31.4	23	.2	83	.9	143	1.5
24	1 36.0	1 36.3	1 31.6	24	.3	84	.9	144	1.6
25	1 36.3	1 36.5	1 31.9	25	.3	85	.9	145	1.6
26	1 36.5	1 36.8	1 32.1	26	.3	86	.9	146	1.6
27	1 36.8	1 37.0	1 32.3	27	.3	87	.9	147	1.6
28	1 37.0	1 37.3	1 32.6	28	.3	88	1.0	148	1.6
29	1 37.3	1 37.5	1 32.8	29	.3	89	1.0	149	1.6
30	1 37.5	1 37.8	1 33.1	30	.3	90	1.0	150	1.6
31	1 37.8	1 38.0	1 33.3	31	.3	91	1.0	151	1.6
32	1 38.0	1 38.3	1 33.5	32	.3	92	1.0	152	1.6
33	1 38.3	1 38.5	1 33.8	33	.4	93	1.0	153	1.7
34	1 38.5	1 38.8	1 34.0	34	.4	94	1.0	154	1.7
35	1 38.8	1 39.0	1 34.3	35	.4	95	1.0	155	1.7
36	1 39.0	1 39.3	1 34.5	36	.4	96	1.0	156	1.7
37	1 39.3	1 39.5	1 34.7	37	.4	97	1.1	157	1.7
38	1 39.5	1 39.8	1 35.0	38	.4	98	1.1	158	1.7
39	1 39.8	1 40.0	1 35.2	39	.4	99	1.1	159	1.7
40	1 40.0	1 40.3	1 35.4	40	.4	100	1.1	160	1.7
41	1 40.3	1 40.5	1 35.7	41	.4	101	1.1	161	1.7
42	1 40.5	1 40.8	1 35.9	42	.5	102	1.1	162	1.8
43	1 40.8	1 41.0	1 36.2	43	.5	103	1.1	163	1.8
44	1 41.0	1 41.3	1 36.4	44	.5	104	1.1	164	1.8
45	1 41.3	1 41.5	1 36.6	45	.5	105	1.1	165	1.8
46	1 41.5	1 41.8	1 36.9	46	.5	106	1.1	166	1.8
47	1 41.8	1 42.0	1 37.1	47	.5	107	1.2	167	1.8
48	1 42.0	1 42.3	1 37.4	48	.5	108	1.2	168	1.8
49	1 42.3	1 42.5	1 37.6	49	.5	109	1.2	169	1.8
50	1 42.5	1 42.8	1 37.8	50	.5	110	1.2	170	1.8
51	1 42.8	1 43.0	1 38.1	51	.6	111	1.2	171	1.9
52	1 43.0	1 43.3	1 38.3	52	.6	112	1.2	172	1.9
53	1 43.3	1 43.5	1 38.5	53	.6	113	1.2	173	1.9
54	1 43.5	1 43.8	1 38.8	54	.6	114	1.2	174	1.9
55	1 43.8	1 44.0	1 39.0	55	.6	115	1.2	175	1.9
56	1 44.0	1 44.3	1 39.3	56	.6	116	1.3	176	1.9
57	1 44.3	1 44.5	1 39.5	57	.6	117	1.3	177	1.9
58	1 44.5	1 44.8	1 39.7	58	.6	118	1.3	178	1.9
59	1 44.8	1 45.0	1 40.0	59	.6	119	1.3	179	1.9
60	1 45.0	1 45.3	1 40.2	60	.7	120	1.3	180	2.0

0 h 7 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	1 45.0	1 45.3	1 40.2	0	.0	60	.8	120	1.5
1	1 45.3	1 45.5	1 40.5	1	.0	61	.8	121	1.5
2	1 45.5	1 45.8	1 40.7	2	.0	62	.8	122	1.5
3	1 45.8	1 46.0	1 40.9	3	.0	63	.8	123	1.5
4	1 46.0	1 46.3	1 41.2	4	.1	64	.8	124	1.6
5	1 46.3	1 46.5	1 41.4	5	.1	65	.8	125	1.6
6	1 46.5	1 46.8	1 41.6	6	.1	66	.8	126	1.6
7	1 46.8	1 47.0	1 41.9	7	.1	67	.8	127	1.6
8	1 47.0	1 47.3	1 42.1	8	.1	68	.9	128	1.6
9	1 47.3	1 47.5	1 42.4	9	.1	69	.9	129	1.6
10	1 47.5	1 47.8	1 42.6	10	.1	70	.9	130	1.6
11	1 47.8	1 48.0	1 42.8	11	.1	71	.9	131	1.6
12	1 48.0	1 48.3	1 43.1	12	.2	72	.9	132	1.7
13	1 48.3	1 48.6	1 43.3	13	.2	73	.9	133	1.7
14	1 48.5	1 48.8	1 43.6	14	.2	74	.9	134	1.7
15	1 48.8	1 49.1	1 43.8	15	.2	75	.9	135	1.7
16	1 49.0	1 49.3	1 44.0	16	.2	76	1.0	136	1.7
17	1 49.3	1 49.6	1 44.3	17	.2	77	1.0	137	1.7
18	1 49.5	1 49.8	1 44.5	18	.2	78	1.0	138	1.7
19	1 49.8	1 50.1	1 44.8	19	.2	79	1.0	139	1.7
20	1 50.0	1 50.3	1 45.0	20	.3	80	1.0	140	1.8
21	1 50.3	1 50.6	1 45.2	21	.3	81	1.0	141	1.8
22	1 50.5	1 50.8	1 45.5	22	.3	82	1.0	142	1.8
23	1 50.8	1 51.1	1 45.7	23	.3	83	1.0	143	1.8
24	1 51.0	1 51.3	1 45.9	24	.3	84	1.1	144	1.8
25	1 51.3	1 51.6	1 46.2	25	.3	85	1.1	145	1.8
26	1 51.5	1 51.8	1 46.4	26	.3	86	1.1	146	1.8
27	1 51.8	1 52.1	1 46.7	27	.3	87	1.1	147	1.8
28	1 52.0	1 52.3	1 46.9	28	.4	88	1.1	148	1.9
29	1 52.3	1 52.6	1 47.1	29	.4	89	1.1	149	1.9
30	1 52.5	1 52.8	1 47.4	30	.4	90	1.1	150	1.9
31	1 52.8	1 53.1	1 47.6	31	.4	91	1.1	151	1.9
32	1 53.0	1 53.3	1 47.9	32	.4	92	1.2	152	1.9
33	1 53.3	1 53.6	1 48.1	33	.4	93	1.2	153	1.9
34	1 53.5	1 53.8	1 48.3	34	.4	94	1.2	154	1.9
35	1 53.8	1 54.1	1 48.6	35	.4	95	1.2	155	1.9
36	1 54.0	1 54.3	1 48.8	36	.5	96	1.2	156	2.0
37	1 54.3	1 54.6	1 49.0	37	.5	97	1.2	157	2.0
38	1 54.5	1 54.8	1 49.3	38	.5	98	1.2	158	2.0
39	1 54.8	1 55.1	1 49.5	39	.5	99	1.2	159	2.0
40	1 55.0	1 55.3	1 49.8	40	.5	100	1.3	160	2.0
41	1 55.3	1 55.6	1 50.0	41	.5	101	1.3	161	2.0
42	1 55.5	1 55.8	1 50.2	42	.5	102	1.3	162	2.0
43	1 55.8	1 56.1	1 50.5	43	.5	103	1.3	163	2.0
44	1 56.0	1 56.3	1 50.7	44	.6	104	1.3	164	2.1
45	1 56.3	1 56.6	1 51.0	45	.6	105	1.3	165	2.1
46	1 56.5	1 56.8	1 51.2	46	.6	106	1.3	166	2.1
47	1 56.8	1 57.1	1 51.4	47	.6	107	1.3	167	2.1
48	1 57.0	1 57.3	1 51.7	48	.6	108	1.4	168	2.1
49	1 57.3	1 57.6	1 51.9	49	.6	109	1.4	169	2.1
50	1 57.5	1 57.8	1 52.1	50	.6	110	1.4	170	2.1
51	1 57.8	1 58.1	1 52.4	51	.6	111	1.4	171	2.1
52	1 58.0	1 58.3	1 52.6	52	.7	112	1.4	172	2.2
53	1 58.3	1 58.6	1 52.9	53	.7	113	1.4	173	2.2
54	1 58.5	1 58.8	1 53.1	54	.7	114	1.4	174	2.2
55	1 58.8	1 59.1	1 53.3	55	.7	115	1.4	175	2.2
56	1 59.0	1 59.3	1 53.6	56	.7	116	1.5	176	2.2
57	1 59.3	1 59.6	1 53.8	57	.7	117	1.5	177	2.2
58	1 59.5	1 59.8	1 54.1	58	.7	118	1.5	178	2.2
59	1 59.8	2 .1	1 54.3	59	.7	119	1.5	179	2.2
60	2 .0	2 .3	1 54.5	60	.8	120	1.5	180	2.3

0 h 8 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 .0	2 .3	1 54.5	0	.0	60	.9	120	1.7
1	2 .3	2 .6	1 54.8	1	.0	61	.9	121	1.7
2	2 .5	2 .8	1 55.0	2	.0	62	.9	122	1.7
3	2 .8	2 1.1	1 55.2	3	.0	63	.9	123	1.7
4	2 1.0	2 1.3	1 55.5	4	.1	64	.9	124	1.8
5	2 1.3	2 1.6	1 55.7	5	.1	65	.9	125	1.8
6	2 1.5	2 1.8	1 56.0	6	.1	66	.9	126	1.8
7	2 1.8	2 2.1	1 56.2	7	.1	67	.9	127	1.8
8	2 2.0	2 2.3	1 56.4	8	.1	68	1.0	128	1.8
9	2 2.3	2 2.6	1 56.7	9	.1	69	1.0	129	1.8
10	2 2.5	2 2.8	1 56.9	10	.1	70	1.0	130	1.8
11	2 2.8	2 3.1	1 57.2	11	.2	71	1.0	131	1.9
12	2 3.0	2 3.3	1 57.4	12	.2	72	1.0	132	1.9
13	2 3.3	2 3.6	1 57.6	13	.2	73	1.0	133	1.9
14	2 3.5	2 3.8	1 57.9	14	.2	74	1.0	134	1.9
15	2 3.8	2 4.1	1 58.1	15	.2	75	1.1	135	1.9
16	2 4.0	2 4.3	1 58.4	16	.2	76	1.1	136	1.9
17	2 4.3	2 4.6	1 58.6	17	.2	77	1.1	137	1.9
18	2 4.5	2 4.8	1 58.8	18	.3	78	1.1	138	2.0
19	2 4.8	2 5.1	1 59.1	19	.3	79	1.1	139	2.0
20	2 5.0	2 5.3	1 59.3	20	.3	80	1.1	140	2.0
21	2 5.3	2 5.6	1 59.5	21	.3	81	1.1	141	2.0
22	2 5.5	2 5.8	1 59.8	22	.3	82	1.2	142	2.0
23	2 5.8	2 6.1	2 .0	23	.3	83	1.2	143	2.0
24	2 6.0	2 6.4	2 .3	24	.3	84	1.2	144	2.0
25	2 6.3	2 6.6	2 .5	25	.4	85	1.2	145	2.1
26	2 6.5	2 6.9	2 .7	26	.4	86	1.2	146	2.1
27	2 6.8	2 7.1	2 1.0	27	.4	87	1.2	147	2.1
28	2 7.0	2 7.4	2 1.2	28	.4	88	1.2	148	2.1
29	2 7.3	2 7.6	2 1.5	29	.4	89	1.3	149	2.1
30	2 7.5	2 7.9	2 1.7	30	.4	90	1.3	150	2.1
31	2 7.8	2 8.1	2 1.9	31	.4	91	1.3	151	2.1
32	2 8.0	2 8.4	2 2.2	32	.5	92	1.3	152	2.2
33	2 8.3	2 8.6	2 2.4	33	.5	93	1.3	153	2.2
34	2 8.5	2 8.9	2 2.6	34	.5	94	1.3	154	2.2
35	2 8.8	2 9.1	2 2.9	35	.5	95	1.3	155	2.2
36	2 9.0	2 9.4	2 3.1	36	.5	96	1.4	156	2.2
37	2 9.3	2 9.6	2 3.4	37	.5	97	1.4	157	2.2
38	2 9.5	2 9.9	2 3.6	38	.5	98	1.4	158	2.2
39	2 9.8	2 10.1	2 3.8	39	.6	99	1.4	159	2.3
40	2 10.0	2 10.4	2 4.1	40	.6	100	1.4	160	2.3
41	2 10.3	2 10.6	2 4.3	41	.6	101	1.4	161	2.3
42	2 10.5	2 10.9	2 4.6	42	.6	102	1.4	162	2.3
43	2 10.8	2 11.1	2 4.8	43	.6	103	1.5	163	2.3
44	2 11.0	2 11.4	2 5.0	44	.6	104	1.5	164	2.3
45	2 11.3	2 11.6	2 5.3	45	.6	105	1.5	165	2.3
46	2 11.5	2 11.9	2 5.5	46	.7	106	1.5	166	2.4
47	2 11.8	2 12.1	2 5.7	47	.7	107	1.5	167	2.4
48	2 12.0	2 12.4	2 6.0	48	.7	108	1.5	168	2.4
49	2 12.3	2 12.6	2 6.2	49	.7	109	1.5	169	2.4
50	2 12.5	2 12.9	2 6.5	50	.7	110	1.6	170	2.4
51	2 12.8	2 13.1	2 6.7	51	.7	111	1.6	171	2.4
52	2 13.0	2 13.4	2 6.9	52	.7	112	1.6	172	2.4
53	2 13.3	2 13.6	2 7.2	53	.8	113	1.6	173	2.5
54	2 13.5	2 13.9	2 7.4	54	.8	114	1.6	174	2.5
55	2 13.8	2 14.1	2 7.7	55	.8	115	1.6	175	2.5
56	2 14.0	2 14.4	2 7.9	56	.8	116	1.6	176	2.5
57	2 14.3	2 14.6	2 8.1	57	.8	117	1.7	177	2.5
58	2 14.5	2 14.9	2 8.4	58	.8	118	1.7	178	2.5
59	2 14.8	2 15.1	2 8.6	59	.8	119	1.7	179	2.5
60	2 15.0	2 15.4	2 8.9	60	.9	120	1.7	180	2.6

0 h 9 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 15.0	2 15.4	2 8.9	0	.0	60	1.0	120	1.9
1	2 15.3	2 15.6	2 9.1	1	.0	61	1.0	121	1.9
2	2 15.5	2 15.9	2 9.3	2	.0	62	1.0	122	1.9
3	2 15.8	2 16.1	2 9.6	3	.0	63	1.0	123	1.9
4	2 16.0	2 16.4	2 9.8	4	.1	64	1.0	124	2.0
5	2 16.3	2 16.6	2 10.0	5	.1	65	1.0	125	2.0
6	2 16.5	2 16.9	2 10.3	6	.1	66	1.0	126	2.0
7	2 16.8	2 17.1	2 10.5	7	.1	67	1.1	127	2.0
8	2 17.0	2 17.4	2 10.8	8	.1	68	1.1	128	2.0
9	2 17.3	2 17.6	2 11.0	9	.1	69	1.1	129	2.0
10	2 17.5	2 17.9	2 11.2	10	.2	70	1.1	130	2.1
11	2 17.8	2 18.1	2 11.5	11	.2	71	1.1	131	2.1
12	2 18.0	2 18.4	2 11.7	12	.2	72	1.1	132	2.1
13	2 18.3	2 18.6	2 12.0	13	.2	73	1.2	133	2.1
14	2 18.5	2 18.9	2 12.2	14	.2	74	1.2	134	2.1
15	2 18.8	2 19.1	2 12.4	15	.2	75	1.2	135	2.1
16	2 19.0	2 19.4	2 12.7	16	.3	76	1.2	136	2.2
17	2 19.3	2 19.6	2 12.9	17	.3	77	1.2	137	2.2
18	2 19.5	2 19.9	2 13.1	18	.3	78	1.2	138	2.2
19	2 19.8	2 20.1	2 13.4	19	.3	79	1.3	139	2.2
20	2 20.0	2 20.4	2 13.6	20	.3	80	1.3	140	2.2
21	2 20.3	2 20.6	2 13.9	21	.3	81	1.3	141	2.2
22	2 20.5	2 20.9	2 14.1	22	.3	82	1.3	142	2.2
23	2 20.8	2 21.1	2 14.3	23	.4	83	1.3	143	2.3
24	2 21.0	2 21.4	2 14.6	24	.4	84	1.3	144	2.3
25	2 21.3	2 21.6	2 14.8	25	.4	85	1.3	145	2.3
26	2 21.5	2 21.9	2 15.1	26	.4	86	1.4	146	2.3
27	2 21.8	2 22.1	2 15.3	27	.4	87	1.4	147	2.3
28	2 22.0	2 22.4	2 15.5	28	.4	88	1.4	148	2.3
29	2 22.3	2 22.6	2 15.8	29	.5	89	1.4	149	2.4
30	2 22.5	2 22.9	2 16.0	30	.5	90	1.4	150	2.4
31	2 22.8	2 23.1	2 16.2	31	.5	91	1.4	151	2.4
32	2 23.0	2 23.4	2 16.5	32	.5	92	1.5	152	2.4
33	2 23.3	2 23.6	2 16.7	33	.5	93	1.5	153	2.4
34	2 23.5	2 23.9	2 17.0	34	.5	94	1.5	154	2.4
35	2 23.8	2 24.1	2 17.2	35	.6	95	1.5	155	2.5
36	2 24.0	2 24.4	2 17.4	36	.6	96	1.5	156	2.5
37	2 24.3	2 24.7	2 17.7	37	.6	97	1.5	157	2.5
38	2 24.5	2 24.9	2 17.9	38	.6	98	1.6	158	2.5
39	2 24.8	2 25.2	2 18.2	39	.6	99	1.6	159	2.5
40	2 25.0	2 25.4	2 18.4	40	.6	100	1.6	160	2.5
41	2 25.3	2 25.7	2 18.6	41	.6	101	1.6	161	2.5
42	2 25.5	2 25.9	2 18.9	42	.7	102	1.6	162	2.6
43	2 25.8	2 26.2	2 19.1	43	.7	103	1.6	163	2.6
44	2 26.0	2 26.4	2 19.3	44	.7	104	1.6	164	2.6
45	2 26.3	2 26.7	2 19.6	45	.7	105	1.7	165	2.6
46	2 26.5	2 26.9	2 19.8	46	.7	106	1.7	166	2.6
47	2 26.8	2 27.2	2 20.1	47	.7	107	1.7	167	2.6
48	2 27.0	2 27.4	2 20.3	48	.8	108	1.7	168	2.7
49	2 27.3	2 27.7	2 20.5	49	.8	109	1.7	169	2.7
50	2 27.5	2 27.9	2 20.8	50	.8	110	1.7	170	2.7
51	2 27.8	2 28.2	2 21.0	51	.8	111	1.8	171	2.7
52	2 28.0	2 28.4	2 21.3	52	.8	112	1.8	172	2.7
53	2 28.3	2 28.7	2 21.5	53	.8	113	1.8	173	2.7
54	2 28.5	2 28.9	2 21.7	54	.9	114	1.8	174	2.8
55	2 28.8	2 29.2	2 22.0	55	.9	115	1.8	175	2.8
56	2 29.0	2 29.4	2 22.2	56	.9	116	1.8	176	2.8
57	2 29.3	2 29.7	2 22.5	57	.9	117	1.9	177	2.8
58	2 29.5	2 29.9	2 22.7	58	.9	118	1.9	178	2.8
59	2 29.8	2 30.2	2 22.9	59	.9	119	1.9	179	2.8
60	2 30.0	2 30.4	2 23.2	60	1.0	120	1.9	180	2.9

0 h 10 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 30.0	2 30.4	2 23.2	0	.0	60	1.1	120	2.1
1	2 30.3	2 30.7	2 23.4	1	.0	61	1.1	121	2.1
2	2 30.5	2 30.9	2 23.6	2	.0	62	1.1	122	2.1
3	2 30.8	2 31.2	2 23.9	3	.1	63	1.1	123	2.2
4	2 31.0	2 31.4	2 24.1	4	.1	64	1.1	124	2.2
5	2 31.3	2 31.7	2 24.4	5	.1	65	1.1	125	2.2
6	2 31.5	2 31.9	2 24.6	6	.1	66	1.2	126	2.2
7	2 31.8	2 32.2	2 24.8	7	.1	67	1.2	127	2.2
8	2 32.0	2 32.4	2 25.1	8	.1	68	1.2	128	2.2
9	2 32.3	2 32.7	2 25.3	9	.2	69	1.2	129	2.3
10	2 32.5	2 32.9	2 25.6	10	.2	70	1.2	130	2.3
11	2 32.8	2 33.2	2 25.8	11	.2	71	1.2	131	2.3
12	2 33.0	2 33.4	2 26.0	12	.2	72	1.3	132	2.3
13	2 33.3	2 33.7	2 26.3	13	.2	73	1.3	133	2.3
14	2 33.5	2 33.9	2 26.5	14	.2	74	1.3	134	2.3
15	2 33.8	2 34.2	2 26.7	15	.3	75	1.3	135	2.4
16	2 34.0	2 34.4	2 27.0	16	.3	76	1.3	136	2.4
17	2 34.3	2 34.7	2 27.2	17	.3	77	1.3	137	2.4
18	2 34.5	2 34.9	2 27.5	18	.3	78	1.4	138	2.4
19	2 34.8	2 35.2	2 27.7	19	.3	79	1.4	139	2.4
20	2 35.0	2 35.4	2 27.9	20	.4	80	1.4	140	2.5
21	2 35.3	2 35.7	2 28.2	21	.4	81	1.4	141	2.5
22	2 35.5	2 35.9	2 28.4	22	.4	82	1.4	142	2.5
23	2 35.8	2 36.2	2 28.7	23	.4	83	1.5	143	2.5
24	2 36.0	2 36.4	2 28.9	24	.4	84	1.5	144	2.5
25	2 36.3	2 36.7	2 29.1	25	.4	85	1.5	145	2.5
26	2 36.5	2 36.9	2 29.4	26	.5	86	1.5	146	2.6
27	2 36.8	2 37.2	2 29.6	27	.5	87	1.5	147	2.6
28	2 37.0	2 37.4	2 29.8	28	.5	88	1.5	148	2.6
29	2 37.3	2 37.7	2 30.1	29	.5	89	1.6	149	2.6
30	2 37.5	2 37.9	2 30.3	30	.5	90	1.6	150	2.6
31	2 37.8	2 38.2	2 30.6	31	.5	91	1.6	151	2.6
32	2 38.0	2 38.4	2 30.8	32	.6	92	1.6	152	2.7
33	2 38.3	2 38.7	2 31.0	33	.6	93	1.6	153	2.7
34	2 38.5	2 38.9	2 31.3	34	.6	94	1.6	154	2.7
35	2 38.8	2 39.2	2 31.5	35	.6	95	1.7	155	2.7
36	2 39.0	2 39.4	2 31.8	36	.6	96	1.7	156	2.7
37	2 39.3	2 39.7	2 32.0	37	.6	97	1.7	157	2.7
38	2 39.5	2 39.9	2 32.2	38	.7	98	1.7	158	2.8
39	2 39.8	2 40.2	2 32.5	39	.7	99	1.7	159	2.8
40	2 40.0	2 40.4	2 32.7	40	.7	100	1.8	160	2.8
41	2 40.3	2 40.7	2 32.9	41	.7	101	1.8	161	2.8
42	2 40.5	2 40.9	2 33.2	42	.7	102	1.8	162	2.8
43	2 40.8	2 41.2	2 33.4	43	.8	103	1.8	163	2.9
44	2 41.0	2 41.4	2 33.7	44	.8	104	1.8	164	2.9
45	2 41.3	2 41.7	2 33.9	45	.8	105	1.8	165	2.9
46	2 41.5	2 41.9	2 34.1	46	.8	106	1.9	166	2.9
47	2 41.8	2 42.2	2 34.4	47	.8	107	1.9	167	2.9
48	2 42.0	2 42.5	2 34.6	48	.8	108	1.9	168	2.9
49	2 42.3	2 42.7	2 34.9	49	.9	109	1.9	169	3.0
50	2 42.5	2 43.0	2 35.1	50	.9	110	1.9	170	3.0
51	2 42.8	2 43.2	2 35.3	51	.9	111	1.9	171	3.0
52	2 43.0	2 43.5	2 35.6	52	.9	112	2.0	172	3.0
53	2 43.3	2 43.7	2 35.8	53	.9	113	2.0	173	3.0
54	2 43.5	2 44.0	2 36.1	54	.9	114	2.0	174	3.0
55	2 43.8	2 44.2	2 36.3	55	1.0	115	2.0	175	3.1
56	2 44.0	2 44.5	2 36.5	56	1.0	116	2.0	176	3.1
57	2 44.3	2 44.7	2 36.8	57	1.0	117	2.0	177	3.1
58	2 44.5	2 45.0	2 37.0	58	1.0	118	2.1	178	3.1
59	2 44.8	2 45.2	2 37.2	59	1.0	119	2.1	179	3.1
60	2 45.0	2 45.5	2 37.5	60	1.1	120	2.1	180	3.2

0 h 11 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	2 45.0	2 45.5	2 37.5	0	.0	60	1.2	120	2.3
1	2 45.3	2 45.7	2 37.7	1	.0	61	1.2	121	2.3
2	2 45.5	2 46.0	2 38.0	2	.0	62	1.2	122	2.3
3	2 45.8	2 46.2	2 38.2	3	.1	63	1.2	123	2.4
4	2 46.0	2 46.5	2 38.4	4	.1	64	1.2	124	2.4
5	2 46.3	2 46.7	2 38.7	5	.1	65	1.2	125	2.4
6	2 46.5	2 47.0	2 38.9	6	.1	66	1.3	126	2.4
7	2 46.8	2 47.2	2 39.2	7	.1	67	1.3	127	2.4
8	2 47.0	2 47.5	2 39.4	8	.2	68	1.3	128	2.5
9	2 47.3	2 47.7	2 39.6	9	.2	69	1.3	129	2.5
10	2 47.5	2 48.0	2 39.9	10	.2	70	1.3	130	2.5
11	2 47.8	2 48.2	2 40.1	11	.2	71	1.4	131	2.5
12	2 48.0	2 48.5	2 40.3	12	.2	72	1.4	132	2.5
13	2 48.3	2 48.7	2 40.6	13	.2	73	1.4	133	2.5
14	2 48.5	2 49.0	2 40.8	14	.3	74	1.4	134	2.6
15	2 48.8	2 49.2	2 41.1	15	.3	75	1.4	135	2.6
16	2 49.0	2 49.5	2 41.3	16	.3	76	1.5	136	2.6
17	2 49.3	2 49.7	2 41.5	17	.3	77	1.5	137	2.6
18	2 49.5	2 50.0	2 41.8	18	.3	78	1.5	138	2.6
19	2 49.8	2 50.2	2 42.0	19	.4	79	1.5	139	2.7
20	2 50.0	2 50.5	2 42.3	20	.4	80	1.5	140	2.7
21	2 50.3	2 50.7	2 42.5	21	.4	81	1.6	141	2.7
22	2 50.5	2 51.0	2 42.7	22	.4	82	1.6	142	2.7
23	2 50.8	2 51.2	2 43.0	23	.4	83	1.6	143	2.7
24	2 51.0	2 51.5	2 43.2	24	.5	84	1.6	144	2.8
25	2 51.3	2 51.7	2 43.4	25	.5	85	1.6	145	2.8
26	2 51.5	2 52.0	2 43.7	26	.5	86	1.6	146	2.8
27	2 51.8	2 52.2	2 43.9	27	.5	87	1.7	147	2.8
28	2 52.0	2 52.5	2 44.2	28	.5	88	1.7	148	2.8
29	2 52.3	2 52.7	2 44.4	29	.6	89	1.7	149	2.9
30	2 52.5	2 53.0	2 44.6	30	.6	90	1.7	150	2.9
31	2 52.8	2 53.2	2 44.9	31	.6	91	1.7	151	2.9
32	2 53.0	2 53.5	2 45.1	32	.6	92	1.8	152	2.9
33	2 53.3	2 53.7	2 45.4	33	.6	93	1.8	153	2.9
34	2 53.5	2 54.0	2 45.6	34	.7	94	1.8	154	3.0
35	2 53.8	2 54.2	2 45.8	35	.7	95	1.8	155	3.0
36	2 54.0	2 54.5	2 46.1	36	.7	96	1.8	156	3.0
37	2 54.3	2 54.7	2 46.3	37	.7	97	1.9	157	3.0
38	2 54.5	2 55.0	2 46.6	38	.7	98	1.9	158	3.0
39	2 54.8	2 55.2	2 46.8	39	.7	99	1.9	159	3.0
40	2 55.0	2 55.5	2 47.0	40	.8	100	1.9	160	3.1
41	2 55.3	2 55.7	2 47.3	41	.8	101	1.9	161	3.1
42	2 55.5	2 56.0	2 47.5	42	.8	102	2.0	162	3.1
43	2 55.8	2 56.2	2 47.7	43	.8	103	2.0	163	3.1
44	2 56.0	2 56.5	2 48.0	44	.8	104	2.0	164	3.1
45	2 56.3	2 56.7	2 48.2	45	.9	105	2.0	165	3.2
46	2 56.5	2 57.0	2 48.5	46	.9	106	2.0	166	3.2
47	2 56.8	2 57.2	2 48.7	47	.9	107	2.1	167	3.2
48	2 57.0	2 57.5	2 48.9	48	.9	108	2.1	168	3.2
49	2 57.3	2 57.7	2 49.2	49	.9	109	2.1	169	3.2
50	2 57.5	2 58.0	2 49.4	50	1.0	110	2.1	170	3.3
51	2 57.8	2 58.2	2 49.7	51	1.0	111	2.1	171	3.3
52	2 58.0	2 58.5	2 49.9	52	1.0	112	2.1	172	3.3
53	2 58.3	2 58.7	2 50.1	53	1.0	113	2.2	173	3.3
54	2 58.5	2 59.0	2 50.4	54	1.0	114	2.2	174	3.3
55	2 58.8	2 59.2	2 50.6	55	1.1	115	2.2	175	3.4
56	2 59.0	2 59.5	2 50.8	56	1.1	116	2.2	176	3.4
57	2 59.3	2 59.7	2 51.1	57	1.1	117	2.2	177	3.4
58	2 59.5	2 60.0	2 51.3	58	1.1	118	2.3	178	3.4
59	2 59.8	3 .2	2 51.6	59	1.1	119	2.3	179	3.4
60	3 .0	3 .5	2 51.8	60	1.2	120	2.3	180	3.5

0 h 12 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 .0	3 .5	2 51.8	0	.0	60	1.3	120	2.5
1	3 .3	3 .8	2 52.0	1	.0	61	1.3	121	2.5
2	3 .5	3 1.0	2 52.3	2	.0	62	1.3	122	2.5
3	3 .8	3 1.3	2 52.5	3	.1	63	1.3	123	2.6
4	3 1.0	3 1.5	2 52.8	4	.1	64	1.3	124	2.6
5	3 1.3	3 1.8	2 53.0	5	.1	65	1.4	125	2.6
6	3 1.5	3 2.0	2 53.2	6	.1	66	1.4	126	2.6
7	3 1.8	3 2.3	2 53.5	7	.1	67	1.4	127	2.6
8	3 2.0	3 2.5	2 53.7	8	.2	68	1.4	128	2.7
9	3 2.3	3 2.8	2 53.9	9	.2	69	1.4	129	2.7
10	3 2.5	3 3.0	2 54.2	10	.2	70	1.5	130	2.7
11	3 2.8	3 3.3	2 54.4	11	.2	71	1.5	131	2.7
12	3 3.0	3 3.5	2 54.7	12	.3	72	1.5	132	2.8
13	3 3.3	3 3.8	2 54.9	13	.3	73	1.5	133	2.8
14	3 3.5	3 4.0	2 55.1	14	.3	74	1.5	134	2.8
15	3 3.8	3 4.3	2 55.4	15	.3	75	1.6	135	2.8
16	3 4.0	3 4.5	2 55.6	16	.3	76	1.6	136	2.8
17	3 4.3	3 4.8	2 55.9	17	.4	77	1.6	137	2.9
18	3 4.5	3 5.0	2 56.1	18	.4	78	1.6	138	2.9
19	3 4.8	3 5.3	2 56.3	19	.4	79	1.6	139	2.9
20	3 5.0	3 5.5	2 56.6	20	.4	80	1.7	140	2.9
21	3 5.3	3 5.8	2 56.8	21	.4	81	1.7	141	2.9
22	3 5.5	3 6.0	2 57.0	22	.5	82	1.7	142	3.0
23	3 5.8	3 6.3	2 57.3	23	.5	83	1.7	143	3.0
24	3 6.0	3 6.5	2 57.5	24	.5	84	1.8	144	3.0
25	3 6.3	3 6.8	2 57.8	25	.5	85	1.8	145	3.0
26	3 6.5	3 7.0	2 58.0	26	.5	86	1.8	146	3.0
27	3 6.8	3 7.3	2 58.2	27	.6	87	1.8	147	3.1
28	3 7.0	3 7.5	2 58.5	28	.6	88	1.8	148	3.1
29	3 7.3	3 7.8	2 58.7	29	.6	89	1.9	149	3.1
30	3 7.5	3 8.0	2 59.0	30	.6	90	1.9	150	3.1
31	3 7.8	3 8.3	2 59.2	31	.6	91	1.9	151	3.1
32	3 8.0	3 8.5	2 59.4	32	.7	92	1.9	152	3.2
33	3 8.3	3 8.8	2 59.7	33	.7	93	1.9	153	3.2
34	3 8.5	3 9.0	2 59.9	34	.7	94	2.0	154	3.2
35	3 8.8	3 9.3	3 .2	35	.7	95	2.0	155	3.2
36	3 9.0	3 9.5	3 .4	36	.8	96	2.0	156	3.3
37	3 9.3	3 9.8	3 .6	37	.8	97	2.0	157	3.3
38	3 9.5	3 10.0	3 .9	38	.8	98	2.0	158	3.3
39	3 9.8	3 10.3	3 1.1	39	.8	99	2.1	159	3.3
40	3 10.0	3 10.5	3 1.3	40	.8	100	2.1	160	3.3
41	3 10.3	3 10.8	3 1.6	41	.9	101	2.1	161	3.4
42	3 10.5	3 11.0	3 1.8	42	.9	102	2.1	162	3.4
43	3 10.8	3 11.3	3 2.1	43	.9	103	2.1	163	3.4
44	3 11.0	3 11.5	3 2.3	44	.9	104	2.2	164	3.4
45	3 11.3	3 11.8	3 2.5	45	.9	105	2.2	165	3.4
46	3 11.5	3 12.0	3 2.8	46	1.0	106	2.2	166	3.5
47	3 11.8	3 12.3	3 3.0	47	1.0	107	2.2	167	3.5
48	3 12.0	3 12.5	3 3.3	48	1.0	108	2.3	168	3.5
49	3 12.3	3 12.8	3 3.5	49	1.0	109	2.3	169	3.5
50	3 12.5	3 13.0	3 3.7	50	1.0	110	2.3	170	3.5
51	3 12.8	3 13.3	3 4.0	51	1.1	111	2.3	171	3.6
52	3 13.0	3 13.5	3 4.2	52	1.1	112	2.3	172	3.6
53	3 13.3	3 13.8	3 4.4	53	1.1	113	2.4	173	3.6
54	3 13.5	3 14.0	3 4.7	54	1.1	114	2.4	174	3.6
55	3 13.8	3 14.3	3 4.9	55	1.1	115	2.4	175	3.6
56	3 14.0	3 14.5	3 5.2	56	1.2	116	2.4	176	3.7
57	3 14.3	3 14.8	3 5.4	57	1.2	117	2.4	177	3.7
58	3 14.5	3 15.0	3 5.6	58	1.2	118	2.5	178	3.7
59	3 14.8	3 15.3	3 5.9	59	1.2	119	2.5	179	3.7
60	3 15.0	3 15.5	3 6.1	60	1.3	120	2.5	180	3.8

0 h 13 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 15.0	3 15.5	3 6.1	0	.0	60	1.4	120	2.7
1	3 15.3	3 15.8	3 6.4	1	.0	61	1.4	121	2.7
2	3 15.5	3 16.0	3 6.6	2	.0	62	1.4	122	2.7
3	3 15.8	3 16.3	3 6.8	3	.1	63	1.4	123	2.8
4	3 16.0	3 16.5	3 7.1	4	.1	64	1.4	124	2.8
5	3 16.3	3 16.8	3 7.3	5	.1	65	1.5	125	2.8
6	3 16.5	3 17.0	3 7.5	6	.1	66	1.5	126	2.8
7	3 16.8	3 17.3	3 7.8	7	.2	67	1.5	127	2.9
8	3 17.0	3 17.5	3 8.0	8	.2	68	1.5	128	2.9
9	3 17.3	3 17.8	3 8.3	9	.2	69	1.6	129	2.9
10	3 17.5	3 18.0	3 8.5	10	.2	70	1.6	130	2.9
11	3 17.8	3 18.3	3 8.7	11	.2	71	1.6	131	2.9
12	3 18.0	3 18.6	3 9.0	12	.3	72	1.6	132	3.0
13	3 18.3	3 18.8	3 9.2	13	.3	73	1.6	133	3.0
14	3 18.5	3 19.1	3 9.5	14	.3	74	1.7	134	3.0
15	3 18.8	3 19.3	3 9.7	15	.3	75	1.7	135	3.0
16	3 19.0	3 19.6	3 9.9	16	.4	76	1.7	136	3.1
17	3 19.3	3 19.8	3 10.2	17	.4	77	1.7	137	3.1
18	3 19.5	3 20.1	3 10.4	18	.4	78	1.8	138	3.1
19	3 19.8	3 20.3	3 10.7	19	.4	79	1.8	139	3.1
20	3 20.0	3 20.6	3 10.9	20	.5	80	1.8	140	3.2
21	3 20.3	3 20.8	3 11.1	21	.5	81	1.8	141	3.2
22	3 20.5	3 21.1	3 11.4	22	.5	82	1.8	142	3.2
23	3 20.8	3 21.3	3 11.6	23	.5	83	1.9	143	3.2
24	3 21.0	3 21.6	3 11.8	24	.5	84	1.9	144	3.2
25	3 21.3	3 21.8	3 12.1	25	.6	85	1.9	145	3.3
26	3 21.5	3 22.1	3 12.3	26	.6	86	1.9	146	3.3
27	3 21.8	3 22.3	3 12.6	27	.6	87	2.0	147	3.3
28	3 22.0	3 22.6	3 12.8	28	.6	88	2.0	148	3.3
29	3 22.3	3 22.8	3 13.0	29	.7	89	2.0	149	3.4
30	3 22.5	3 23.1	3 13.3	30	.7	90	2.0	150	3.4
31	3 22.8	3 23.3	3 13.5	31	.7	91	2.0	151	3.4
32	3 23.0	3 23.6	3 13.8	32	.7	92	2.1	152	3.4
33	3 23.3	3 23.8	3 14.0	33	.7	93	2.1	153	3.4
34	3 23.5	3 24.1	3 14.2	34	.8	94	2.1	154	3.5
35	3 23.8	3 24.3	3 14.5	35	.8	95	2.1	155	3.5
36	3 24.0	3 24.6	3 14.7	36	.8	96	2.2	156	3.5
37	3 24.3	3 24.8	3 14.9	37	.8	97	2.2	157	3.5
38	3 24.5	3 25.1	3 15.2	38	.9	98	2.2	158	3.6
39	3 24.8	3 25.3	3 15.4	39	.9	99	2.2	159	3.6
40	3 25.0	3 25.6	3 15.7	40	.9	100	2.3	160	3.6
41	3 25.3	3 25.8	3 15.9	41	.9	101	2.3	161	3.6
42	3 25.5	3 26.1	3 16.1	42	.9	102	2.3	162	3.6
43	3 25.8	3 26.3	3 16.4	43	1.0	103	2.3	163	3.7
44	3 26.0	3 26.6	3 16.6	44	1.0	104	2.3	164	3.7
45	3 26.3	3 26.8	3 16.9	45	1.0	105	2.4	165	3.7
46	3 26.5	3 27.1	3 17.1	46	1.0	106	2.4	166	3.7
47	3 26.8	3 27.3	3 17.3	47	1.1	107	2.4	167	3.8
48	3 27.0	3 27.6	3 17.6	48	1.1	108	2.4	168	3.8
49	3 27.3	3 27.8	3 17.8	49	1.1	109	2.5	169	3.8
50	3 27.5	3 28.1	3 18.0	50	1.1	110	2.5	170	3.8
51	3 27.8	3 28.3	3 18.3	51	1.1	111	2.5	171	3.8
52	3 28.0	3 28.6	3 18.5	52	1.2	112	2.5	172	3.9
53	3 28.3	3 28.8	3 18.8	53	1.2	113	2.5	173	3.9
54	3 28.5	3 29.1	3 19.0	54	1.2	114	2.6	174	3.9
55	3 28.8	3 29.3	3 19.2	55	1.2	115	2.6	175	3.9
56	3 29.0	3 29.6	3 19.5	56	1.3	116	2.6	176	4.0
57	3 29.3	3 29.8	3 19.7	57	1.3	117	2.6	177	4.0
58	3 29.5	3 30.1	3 20.0	58	1.3	118	2.7	178	4.0
59	3 29.8	3 30.3	3 20.2	59	1.3	119	2.7	179	4.0
60	3 30.0	3 30.6	3 20.4	60	1.4	120	2.7	180	4.1

0 h 14 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 30.0	3 30.6	3 20.4	0	.0	60	1.5	120	2.9
1	3 30.3	3 30.8	3 20.7	1	.0	61	1.5	121	2.9
2	3 30.5	3 31.1	3 20.9	2	.0	62	1.5	122	2.9
3	3 30.8	3 31.3	3 21.1	3	.1	63	1.5	123	3.0
4	3 31.0	3 31.6	3 21.4	4	.1	64	1.5	124	3.0
5	3 31.3	3 31.8	3 21.6	5	.1	65	1.6	125	3.0
6	3 31.5	3 32.1	3 21.9	6	.1	66	1.6	126	3.0
7	3 31.8	3 32.3	3 22.1	7	.2	67	1.6	127	3.1
8	3 32.0	3 32.6	3 22.3	8	.2	68	1.6	128	3.1
9	3 32.3	3 32.8	3 22.6	9	.2	69	1.7	129	3.1
10	3 32.5	3 33.1	3 22.8	10	.2	70	1.7	130	3.1
11	3 32.8	3 33.3	3 23.1	11	.3	71	1.7	131	3.2
12	3 33.0	3 33.6	3 23.3	12	.3	72	1.7	132	3.2
13	3 33.3	3 33.8	3 23.5	13	.3	73	1.8	133	3.2
14	3 33.5	3 34.1	3 23.8	14	.3	74	1.8	134	3.2
15	3 33.8	3 34.3	3 24.0	15	.4	75	1.8	135	3.3
16	3 34.0	3 34.6	3 24.3	16	.4	76	1.8	136	3.3
17	3 34.3	3 34.8	3 24.5	17	.4	77	1.9	137	3.3
18	3 34.5	3 35.1	3 24.7	18	.4	78	1.9	138	3.3
19	3 34.8	3 35.3	3 25.0	19	.5	79	1.9	139	3.4
20	3 35.0	3 35.6	3 25.2	20	.5	80	1.9	140	3.4
21	3 35.3	3 35.8	3 25.4	21	.5	81	2.0	141	3.4
22	3 35.5	3 36.1	3 25.7	22	.5	82	2.0	142	3.4
23	3 35.8	3 36.3	3 25.9	23	.6	83	2.0	143	3.5
24	3 36.0	3 36.6	3 26.2	24	.6	84	2.0	144	3.5
25	3 36.3	3 36.9	3 26.4	25	.6	85	2.1	145	3.5
26	3 36.5	3 37.1	3 26.6	26	.6	86	2.1	146	3.5
27	3 36.8	3 37.4	3 26.9	27	.7	87	2.1	147	3.6
28	3 37.0	3 37.6	3 27.1	28	.7	88	2.1	148	3.6
29	3 37.3	3 37.9	3 27.4	29	.7	89	2.2	149	3.6
30	3 37.5	3 38.1	3 27.6	30	.7	90	2.2	150	3.6
31	3 37.8	3 38.4	3 27.8	31	.7	91	2.2	151	3.6
32	3 38.0	3 38.6	3 28.1	32	.8	92	2.2	152	3.7
33	3 38.3	3 38.9	3 28.3	33	.8	93	2.2	153	3.7
34	3 38.5	3 39.1	3 28.5	34	.8	94	2.3	154	3.7
35	3 38.8	3 39.4	3 28.8	35	.8	95	2.3	155	3.7
36	3 39.0	3 39.6	3 29.0	36	.9	96	2.3	156	3.8
37	3 39.3	3 39.9	3 29.3	37	.9	97	2.3	157	3.8
38	3 39.5	3 40.1	3 29.5	38	.9	98	2.4	158	3.8
39	3 39.8	3 40.4	3 29.7	39	.9	99	2.4	159	3.8
40	3 40.0	3 40.6	3 30.0	40	1.0	100	2.4	160	3.9
41	3 40.3	3 40.9	3 30.2	41	1.0	101	2.4	161	3.9
42	3 40.5	3 41.1	3 30.5	42	1.0	102	2.5	162	3.9
43	3 40.8	3 41.4	3 30.7	43	1.0	103	2.5	163	3.9
44	3 41.0	3 41.6	3 30.9	44	1.1	104	2.5	164	4.0
45	3 41.3	3 41.9	3 31.2	45	1.1	105	2.5	165	4.0
46	3 41.5	3 42.1	3 31.4	46	1.1	106	2.6	166	4.0
47	3 41.8	3 42.4	3 31.6	47	1.1	107	2.6	167	4.0
48	3 42.0	3 42.6	3 31.9	48	1.2	108	2.6	168	4.1
49	3 42.3	3 42.9	3 32.1	49	1.2	109	2.6	169	4.1
50	3 42.5	3 43.1	3 32.4	50	1.2	110	2.7	170	4.1
51	3 42.8	3 43.4	3 32.6	51	1.2	111	2.7	171	4.1
52	3 43.0	3 43.6	3 32.8	52	1.3	112	2.7	172	4.2
53	3 43.3	3 43.9	3 33.1	53	1.3	113	2.7	173	4.2
54	3 43.5	3 44.1	3 33.3	54	1.3	114	2.8	174	4.2
55	3 43.8	3 44.4	3 33.6	55	1.3	115	2.8	175	4.2
56	3 44.0	3 44.6	3 33.8	56	1.4	116	2.8	176	4.3
57	3 44.3	3 44.9	3 34.0	57	1.4	117	2.8	177	4.3
58	3 44.5	3 45.1	3 34.3	58	1.4	118	2.9	178	4.3
59	3 44.8	3 45.4	3 34.5	59	1.4	119	2.9	179	4.3
60	3 45.0	3 45.6	3 34.8	60	1.5	120	2.9	180	4.4

0 h 15 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	3 45.0	3 45.6	3 34.8	0	.0	60	1.6	120	3.1
1	3 45.3	3 45.9	3 35.0	1	.0	61	1.6	121	3.1
2	3 45.5	3 46.1	3 35.2	2	.1	62	1.6	122	3.2
3	3 45.8	3 46.4	3 35.5	3	.1	63	1.6	123	3.2
4	3 46.0	3 46.6	3 35.7	4	.1	64	1.7	124	3.2
5	3 46.3	3 46.9	3 35.9	5	.1	65	1.7	125	3.2
6	3 46.5	3 47.1	3 36.2	6	.2	66	1.7	126	3.3
7	3 46.8	3 47.4	3 36.4	7	.2	67	1.7	127	3.3
8	3 47.0	3 47.6	3 36.7	8	.2	68	1.8	128	3.3
9	3 47.3	3 47.9	3 36.9	9	.2	69	1.8	129	3.3
10	3 47.5	3 48.1	3 37.1	10	.3	70	1.8	130	3.4
11	3 47.8	3 48.4	3 37.4	11	.3	71	1.8	131	3.4
12	3 48.0	3 48.6	3 37.6	12	.3	72	1.9	132	3.4
13	3 48.3	3 48.9	3 37.9	13	.3	73	1.9	133	3.4
14	3 48.5	3 49.1	3 38.1	14	.4	74	1.9	134	3.5
15	3 48.8	3 49.4	3 38.3	15	.4	75	1.9	135	3.5
16	3 49.0	3 49.6	3 38.6	16	.4	76	2.0	136	3.5
17	3 49.3	3 49.9	3 38.8	17	.4	77	2.0	137	3.5
18	3 49.5	3 50.1	3 39.0	18	.5	78	2.0	138	3.6
19	3 49.8	3 50.4	3 39.3	19	.5	79	2.0	139	3.6
20	3 50.0	3 50.6	3 39.5	20	.5	80	2.1	140	3.6
21	3 50.3	3 50.9	3 39.8	21	.5	81	2.1	141	3.6
22	3 50.5	3 51.1	3 40.0	22	.6	82	2.1	142	3.7
23	3 50.8	3 51.4	3 40.2	23	.6	83	2.1	143	3.7
24	3 51.0	3 51.6	3 40.5	24	.6	84	2.2	144	3.7
25	3 51.3	3 51.9	3 40.7	25	.6	85	2.2	145	3.7
26	3 51.5	3 52.1	3 41.0	26	.7	86	2.2	146	3.8
27	3 51.8	3 52.4	3 41.2	27	.7	87	2.2	147	3.8
28	3 52.0	3 52.6	3 41.4	28	.7	88	2.3	148	3.8
29	3 52.3	3 52.9	3 41.7	29	.7	89	2.3	149	3.8
30	3 52.5	3 53.1	3 41.9	30	.8	90	2.3	150	3.9
31	3 52.8	3 53.4	3 42.1	31	.8	91	2.4	151	3.9
32	3 53.0	3 53.6	3 42.4	32	.8	92	2.4	152	3.9
33	3 53.3	3 53.9	3 42.6	33	.9	93	2.4	153	4.0
34	3 53.5	3 54.1	3 42.9	34	.9	94	2.4	154	4.0
35	3 53.8	3 54.4	3 43.1	35	.9	95	2.5	155	4.0
36	3 54.0	3 54.7	3 43.3	36	.9	96	2.5	156	4.0
37	3 54.3	3 54.9	3 43.6	37	1.0	97	2.5	157	4.1
38	3 54.5	3 55.2	3 43.8	38	1.0	98	2.5	158	4.1
39	3 54.8	3 55.4	3 44.1	39	1.0	99	2.6	159	4.1
40	3 55.0	3 55.7	3 44.3	40	1.0	100	2.6	160	4.1
41	3 55.3	3 55.9	3 44.5	41	1.1	101	2.6	161	4.2
42	3 55.5	3 56.2	3 44.8	42	1.1	102	2.6	162	4.2
43	3 55.8	3 56.4	3 45.0	43	1.1	103	2.7	163	4.2
44	3 56.0	3 56.7	3 45.2	44	1.1	104	2.7	164	4.2
45	3 56.3	3 56.9	3 45.5	45	1.2	105	2.7	165	4.3
46	3 56.5	3 57.2	3 45.7	46	1.2	106	2.7	166	4.3
47	3 56.8	3 57.4	3 46.0	47	1.2	107	2.8	167	4.3
48	3 57.0	3 57.7	3 46.2	48	1.2	108	2.8	168	4.3
49	3 57.3	3 57.9	3 46.4	49	1.3	109	2.8	169	4.4
50	3 57.5	3 58.2	3 46.7	50	1.3	110	2.8	170	4.4
51	3 57.8	3 58.4	3 46.9	51	1.3	111	2.9	171	4.4
52	3 58.0	3 58.7	3 47.2	52	1.3	112	2.9	172	4.4
53	3 58.3	3 58.9	3 47.4	53	1.4	113	2.9	173	4.5
54	3 58.5	3 59.2	3 47.6	54	1.4	114	2.9	174	4.5
55	3 58.8	3 59.4	3 47.9	55	1.4	115	3.0	175	4.5
56	3 59.0	3 59.7	3 48.1	56	1.4	116	3.0	176	4.5
57	3 59.3	3 59.9	3 48.4	57	1.5	117	3.0	177	4.6
58	3 59.5	4 .2	3 48.6	58	1.5	118	3.0	178	4.6
59	3 59.8	4 .4	3 48.8	59	1.5	119	3.1	179	4.6
60	4 .0	4 .7	3 49.1	60	1.6	120	3.1	180	4.7

0 h 16 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 .0	4 .7	3 49.1	0	.0	60	1.7	120	3.3
1	4 .3	4 .9	3 49.3	1	.0	61	1.7	121	3.3
2	4 .5	4 1.2	3 49.5	2	.1	62	1.7	122	3.4
3	4 .8	4 1.4	3 49.8	3	.1	63	1.7	123	3.4
4	4 1.0	4 1.7	3 50.0	4	.1	64	1.8	124	3.4
5	4 1.3	4 1.9	3 50.3	5	.1	65	1.8	125	3.4
6	4 1.5	4 2.2	3 50.5	6	.2	66	1.8	126	3.5
7	4 1.8	4 2.4	3 50.7	7	.2	67	1.8	127	3.5
8	4 2.0	4 2.7	3 51.0	8	.2	68	1.9	128	3.5
9	4 2.3	4 2.9	3 51.2	9	.2	69	1.9	129	3.5
10	4 2.5	4 3.2	3 51.5	10	.3	70	1.9	130	3.6
11	4 2.8	4 3.4	3 51.7	11	.3	71	2.0	131	3.6
12	4 3.0	4 3.7	3 51.9	12	.3	72	2.0	132	3.6
13	4 3.3	4 3.9	3 52.2	13	.4	73	2.0	133	3.7
14	4 3.5	4 4.2	3 52.4	14	.4	74	2.0	134	3.7
15	4 3.8	4 4.4	3 52.6	15	.4	75	2.1	135	3.7
16	4 4.0	4 4.7	3 52.9	16	.4	76	2.1	136	3.7
17	4 4.3	4 4.9	3 53.1	17	.5	77	2.1	137	3.8
18	4 4.5	4 5.2	3 53.4	18	.5	78	2.1	138	3.8
19	4 4.8	4 5.4	3 53.6	19	.5	79	2.2	139	3.8
20	4 5.0	4 5.7	3 53.8	20	.6	80	2.2	140	3.9
21	4 5.3	4 5.9	3 54.1	21	.6	81	2.2	141	3.9
22	4 5.5	4 6.2	3 54.3	22	.6	82	2.3	142	3.9
23	4 5.8	4 6.4	3 54.6	23	.6	83	2.3	143	3.9
24	4 6.0	4 6.7	3 54.8	24	.7	84	2.3	144	4.0
25	4 6.3	4 6.9	3 55.0	25	.7	85	2.3	145	4.0
26	4 6.5	4 7.2	3 55.3	26	.7	86	2.4	146	4.0
27	4 6.8	4 7.4	3 55.5	27	.7	87	2.4	147	4.0
28	4 7.0	4 7.7	3 55.7	28	.8	88	2.4	148	4.1
29	4 7.3	4 7.9	3 56.0	29	.8	89	2.4	149	4.1
30	4 7.5	4 8.2	3 56.2	30	.8	90	2.5	150	4.1
31	4 7.8	4 8.4	3 56.5	31	.9	91	2.5	151	4.2
32	4 8.0	4 8.7	3 56.7	32	.9	92	2.5	152	4.2
33	4 8.3	4 8.9	3 56.9	33	.9	93	2.6	153	4.2
34	4 8.5	4 9.2	3 57.2	34	.9	94	2.6	154	4.2
35	4 8.8	4 9.4	3 57.4	35	1.0	95	2.6	155	4.3
36	4 9.0	4 9.7	3 57.7	36	1.0	96	2.6	156	4.3
37	4 9.3	4 9.9	3 57.9	37	1.0	97	2.7	157	4.3
38	4 9.5	4 10.2	3 58.1	38	1.0	98	2.7	158	4.3
39	4 9.8	4 10.4	3 58.4	39	1.1	99	2.7	159	4.4
40	4 10.0	4 10.7	3 58.6	40	1.1	100	2.8	160	4.4
41	4 10.3	4 10.9	3 58.8	41	1.1	101	2.8	161	4.4
42	4 10.5	4 11.2	3 59.1	42	1.2	102	2.8	162	4.5
43	4 10.8	4 11.4	3 59.3	43	1.2	103	2.8	163	4.5
44	4 11.0	4 11.7	3 59.6	44	1.2	104	2.9	164	4.5
45	4 11.3	4 11.9	3 59.8	45	1.2	105	2.9	165	4.5
46	4 11.5	4 12.2	4 .0	46	1.3	106	2.9	166	4.6
47	4 11.8	4 12.4	4 .3	47	1.3	107	2.9	167	4.6
48	4 12.0	4 12.7	4 .5	48	1.3	108	3.0	168	4.6
49	4 12.3	4 13.0	4 .8	49	1.3	109	3.0	169	4.6
50	4 12.5	4 13.2	4 1.0	50	1.4	110	3.0	170	4.7
51	4 12.8	4 13.5	4 1.2	51	1.4	111	3.1	171	4.7
52	4 13.0	4 13.7	4 1.5	52	1.4	112	3.1	172	4.7
53	4 13.3	4 14.0	4 1.7	53	1.5	113	3.1	173	4.8
54	4 13.5	4 14.2	4 2.0	54	1.5	114	3.1	174	4.8
55	4 13.8	4 14.5	4 2.2	55	1.5	115	3.2	175	4.8
56	4 14.0	4 14.7	4 2.4	56	1.5	116	3.2	176	4.8
57	4 14.3	4 15.0	4 2.7	57	1.6	117	3.2	177	4.9
58	4 14.5	4 15.2	4 2.9	58	1.6	118	3.2	178	4.9
59	4 14.8	4 15.5	4 3.1	59	1.6	119	3.3	179	4.9
60	4 15.0	4 15.7	4 3.4	60	1.7	120	3.3	180	5.0

0 h 17 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 15.0	4 15.7	4 3.4	0	.0	60	1.8	120	3.5
1	4 15.3	4 16.0	4 3.6	1	.0	61	1.8	121	3.5
2	4 15.5	4 16.2	4 3.9	2	.1	62	1.8	122	3.6
3	4 15.8	4 16.5	4 4.1	3	.1	63	1.8	123	3.6
4	4 16.0	4 16.7	4 4.3	4	.1	64	1.9	124	3.6
5	4 16.3	4 17.0	4 4.6	5	.1	65	1.9	125	3.6
6	4 16.5	4 17.2	4 4.8	6	.2	66	1.9	126	3.7
7	4 16.8	4 17.5	4 5.1	7	.2	67	2.0	127	3.7
8	4 17.0	4 17.7	4 5.3	8	.2	68	2.0	128	3.7
9	4 17.3	4 18.0	4 5.5	9	.3	69	2.0	129	3.8
10	4 17.5	4 18.2	4 5.8	10	.3	70	2.0	130	3.8
11	4 17.8	4 18.5	4 6.0	11	.3	71	2.1	131	3.8
12	4 18.0	4 18.7	4 6.2	12	.4	72	2.1	132	3.9
13	4 18.3	4 19.0	4 6.5	13	.4	73	2.1	133	3.9
14	4 18.5	4 19.2	4 6.7	14	.4	74	2.2	134	3.9
15	4 18.8	4 19.5	4 7.0	15	.4	75	2.2	135	3.9
16	4 19.0	4 19.7	4 7.2	16	.5	76	2.2	136	4.0
17	4 19.3	4 20.0	4 7.4	17	.5	77	2.2	137	4.0
18	4 19.5	4 20.2	4 7.7	18	.5	78	2.3	138	4.0
19	4 19.8	4 20.5	4 7.9	19	.6	79	2.3	139	4.1
20	4 20.0	4 20.7	4 8.2	20	.6	80	2.3	140	4.1
21	4 20.3	4 21.0	4 8.4	21	.6	81	2.4	141	4.1
22	4 20.5	4 21.2	4 8.6	22	.6	82	2.4	142	4.1
23	4 20.8	4 21.5	4 8.9	23	.7	83	2.4	143	4.2
24	4 21.0	4 21.7	4 9.1	24	.7	84	2.5	144	4.2
25	4 21.3	4 22.0	4 9.3	25	.7	85	2.5	145	4.2
26	4 21.5	4 22.2	4 9.6	26	.8	86	2.5	146	4.3
27	4 21.8	4 22.5	4 9.8	27	.8	87	2.5	147	4.3
28	4 22.0	4 22.7	4 10.1	28	.8	88	2.6	148	4.3
29	4 22.3	4 23.0	4 10.3	29	.8	89	2.6	149	4.3
30	4 22.5	4 23.2	4 10.5	30	.9	90	2.6	150	4.4
31	4 22.8	4 23.5	4 10.8	31	.9	91	2.7	151	4.4
32	4 23.0	4 23.7	4 11.0	32	.9	92	2.7	152	4.4
33	4 23.3	4 24.0	4 11.3	33	1.0	93	2.7	153	4.5
34	4 23.5	4 24.2	4 11.5	34	1.0	94	2.7	154	4.5
35	4 23.8	4 24.5	4 11.7	35	1.0	95	2.8	155	4.5
36	4 24.0	4 24.7	4 12.0	36	1.1	96	2.8	156	4.6
37	4 24.3	4 25.0	4 12.2	37	1.1	97	2.8	157	4.6
38	4 24.5	4 25.2	4 12.5	38	1.1	98	2.9	158	4.6
39	4 24.8	4 25.5	4 12.7	39	1.1	99	2.9	159	4.6
40	4 25.0	4 25.7	4 12.9	40	1.2	100	2.9	160	4.7
41	4 25.3	4 26.0	4 13.2	41	1.2	101	2.9	161	4.7
42	4 25.5	4 26.2	4 13.4	42	1.2	102	3.0	162	4.7
43	4 25.8	4 26.5	4 13.6	43	1.3	103	3.0	163	4.8
44	4 26.0	4 26.7	4 13.9	44	1.3	104	3.0	164	4.8
45	4 26.3	4 27.0	4 14.1	45	1.3	105	3.1	165	4.8
46	4 26.5	4 27.2	4 14.4	46	1.3	106	3.1	166	4.8
47	4 26.8	4 27.5	4 14.6	47	1.4	107	3.1	167	4.9
48	4 27.0	4 27.7	4 14.8	48	1.4	108	3.2	168	4.9
49	4 27.3	4 28.0	4 15.1	49	1.4	109	3.2	169	4.9
50	4 27.5	4 28.2	4 15.3	50	1.5	110	3.2	170	5.0
51	4 27.8	4 28.5	4 15.6	51	1.5	111	3.2	171	5.0
52	4 28.0	4 28.7	4 15.8	52	1.5	112	3.3	172	5.0
53	4 28.3	4 29.0	4 16.0	53	1.5	113	3.3	173	5.0
54	4 28.5	4 29.2	4 16.3	54	1.6	114	3.3	174	5.1
55	4 28.8	4 29.5	4 16.5	55	1.6	115	3.4	175	5.1
56	4 29.0	4 29.7	4 16.7	56	1.6	116	3.4	176	5.1
57	4 29.3	4 30.0	4 17.0	57	1.7	117	3.4	177	5.2
58	4 29.5	4 30.2	4 17.2	58	1.7	118	3.4	178	5.2
59	4 29.8	4 30.5	4 17.5	59	1.7	119	3.5	179	5.2
60	4 30.0	4 30.8	4 17.7	60	1.8	120	3.5	180	5.3

0 h 18 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 30.0	4 30.8	4 17.7	0	.0	60	1.9	120	3.7
1	4 30.3	4 31.0	4 17.9	1	.0	61	1.9	121	3.7
2	4 30.5	4 31.3	4 18.2	2	.1	62	1.9	122	3.8
3	4 30.8	4 31.5	4 18.4	3	.1	63	1.9	123	3.8
4	4 31.0	4 31.8	4 18.7	4	.1	64	2.0	124	3.8
5	4 31.3	4 32.0	4 18.9	5	.2	65	2.0	125	3.9
6	4 31.5	4 32.3	4 19.1	6	.2	66	2.0	126	3.9
7	4 31.8	4 32.5	4 19.4	7	.2	67	2.1	127	3.9
8	4 32.0	4 32.8	4 19.6	8	.2	68	2.1	128	3.9
9	4 32.3	4 33.0	4 19.8	9	.3	69	2.1	129	4.0
10	4 32.5	4 33.3	4 20.1	10	.3	70	2.2	130	4.0
11	4 32.8	4 33.5	4 20.3	11	.3	71	2.2	131	4.0
12	4 33.0	4 33.8	4 20.6	12	.4	72	2.2	132	4.1
13	4 33.3	4 34.0	4 20.8	13	.4	73	2.3	133	4.1
14	4 33.5	4 34.3	4 21.0	14	.4	74	2.3	134	4.1
15	4 33.8	4 34.5	4 21.3	15	.5	75	2.3	135	4.2
16	4 34.0	4 34.8	4 21.5	16	.5	76	2.3	136	4.2
17	4 34.3	4 35.0	4 21.8	17	.5	77	2.4	137	4.2
18	4 34.5	4 35.3	4 22.0	18	.6	78	2.4	138	4.3
19	4 34.8	4 35.5	4 22.2	19	.6	79	2.4	139	4.3
20	4 35.0	4 35.8	4 22.5	20	.6	80	2.5	140	4.3
21	4 35.3	4 36.0	4 22.7	21	.6	81	2.5	141	4.3
22	4 35.5	4 36.3	4 22.9	22	.7	82	2.5	142	4.4
23	4 35.8	4 36.5	4 23.2	23	.7	83	2.6	143	4.4
24	4 36.0	4 36.8	4 23.4	24	.7	84	2.6	144	4.4
25	4 36.3	4 37.0	4 23.7	25	.8	85	2.6	145	4.5
26	4 36.5	4 37.3	4 23.9	26	.8	86	2.7	146	4.5
27	4 36.8	4 37.5	4 24.1	27	.8	87	2.7	147	4.5
28	4 37.0	4 37.8	4 24.4	28	.9	88	2.7	148	4.6
29	4 37.3	4 38.0	4 24.6	29	.9	89	2.7	149	4.6
30	4 37.5	4 38.3	4 24.9	30	.9	90	2.8	150	4.6
31	4 37.8	4 38.5	4 25.1	31	1.0	91	2.8	151	4.7
32	4 38.0	4 38.8	4 25.3	32	1.0	92	2.8	152	4.7
33	4 38.3	4 39.0	4 25.6	33	1.0	93	2.9	153	4.7
34	4 38.5	4 39.3	4 25.8	34	1.0	94	2.9	154	4.7
35	4 38.8	4 39.5	4 26.1	35	1.1	95	2.9	155	4.8
36	4 39.0	4 39.8	4 26.3	36	1.1	96	3.0	156	4.8
37	4 39.3	4 40.0	4 26.5	37	1.1	97	3.0	157	4.8
38	4 39.5	4 40.3	4 26.8	38	1.2	98	3.0	158	4.9
39	4 39.8	4 40.5	4 27.0	39	1.2	99	3.1	159	4.9
40	4 40.0	4 40.8	4 27.2	40	1.2	100	3.1	160	4.9
41	4 40.3	4 41.0	4 27.5	41	1.3	101	3.1	161	5.0
42	4 40.5	4 41.3	4 27.7	42	1.3	102	3.1	162	5.0
43	4 40.8	4 41.5	4 28.0	43	1.3	103	3.2	163	5.0
44	4 41.0	4 41.8	4 28.2	44	1.4	104	3.2	164	5.1
45	4 41.3	4 42.0	4 28.4	45	1.4	105	3.2	165	5.1
46	4 41.5	4 42.3	4 28.7	46	1.4	106	3.3	166	5.1
47	4 41.8	4 42.5	4 28.9	47	1.4	107	3.3	167	5.1
48	4 42.0	4 42.8	4 29.2	48	1.5	108	3.3	168	5.2
49	4 42.3	4 43.0	4 29.4	49	1.5	109	3.4	169	5.2
50	4 42.5	4 43.3	4 29.6	50	1.5	110	3.4	170	5.2
51	4 42.8	4 43.5	4 29.9	51	1.6	111	3.4	171	5.3
52	4 43.0	4 43.8	4 30.1	52	1.6	112	3.5	172	5.3
53	4 43.3	4 44.0	4 30.3	53	1.6	113	3.5	173	5.3
54	4 43.5	4 44.3	4 30.6	54	1.7	114	3.5	174	5.4
55	4 43.8	4 44.5	4 30.8	55	1.7	115	3.5	175	5.4
56	4 44.0	4 44.8	4 31.1	56	1.7	116	3.6	176	5.4
57	4 44.3	4 45.0	4 31.3	57	1.8	117	3.6	177	5.5
58	4 44.5	4 45.3	4 31.5	58	1.8	118	3.6	178	5.5
59	4 44.8	4 45.5	4 31.8	59	1.8	119	3.7	179	5.5
60	4 45.0	4 45.8	4 32.0	60	1.9	120	3.7	180	5.6

0 h 19 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	4 45.0	4 45.8	4 32.0	0	.0	60	2.0	120	3.9
1	4 45.3	4 46.0	4 32.3	1	.0	61	2.0	121	3.9
2	4 45.5	4 46.3	4 32.5	2	.1	62	2.0	122	4.0
3	4 45.8	4 46.5	4 32.7	3	.1	63	2.0	123	4.0
4	4 46.0	4 46.8	4 33.0	4	.1	64	2.1	124	4.0
5	4 46.3	4 47.0	4 33.2	5	.2	65	2.1	125	4.1
6	4 46.5	4 47.3	4 33.4	6	.2	66	2.1	126	4.1
7	4 46.8	4 47.5	4 33.7	7	.2	67	2.2	127	4.1
8	4 47.0	4 47.8	4 33.9	8	.3	68	2.2	128	4.2
9	4 47.3	4 48.0	4 34.2	9	.3	69	2.2	129	4.2
10	4 47.5	4 48.3	4 34.4	10	.3	70	2.3	130	4.2
11	4 47.8	4 48.5	4 34.6	11	.4	71	2.3	131	4.3
12	4 48.0	4 48.8	4 34.9	12	.4	72	2.3	132	4.3
13	4 48.3	4 49.1	4 35.1	13	.4	73	2.4	133	4.3
14	4 48.5	4 49.3	4 35.4	14	.5	74	2.4	134	4.4
15	4 48.8	4 49.6	4 35.6	15	.5	75	2.4	135	4.4
16	4 49.0	4 49.8	4 35.8	16	.5	76	2.5	136	4.4
17	4 49.3	4 50.1	4 36.1	17	.6	77	2.5	137	4.5
18	4 49.5	4 50.3	4 36.3	18	.6	78	2.5	138	4.5
19	4 49.8	4 50.6	4 36.6	19	.6	79	2.6	139	4.5
20	4 50.0	4 50.8	4 36.8	20	.7	80	2.6	140	4.6
21	4 50.3	4 51.1	4 37.0	21	.7	81	2.6	141	4.6
22	4 50.5	4 51.3	4 37.3	22	.7	82	2.7	142	4.6
23	4 50.8	4 51.6	4 37.5	23	.7	83	2.7	143	4.6
24	4 51.0	4 51.8	4 37.7	24	.8	84	2.7	144	4.7
25	4 51.3	4 52.1	4 38.0	25	.8	85	2.8	145	4.7
26	4 51.5	4 52.3	4 38.2	26	.8	86	2.8	146	4.7
27	4 51.8	4 52.6	4 38.5	27	.9	87	2.8	147	4.8
28	4 52.0	4 52.8	4 38.7	28	.9	88	2.9	148	4.8
29	4 52.3	4 53.1	4 38.9	29	.9	89	2.9	149	4.8
30	4 52.5	4 53.3	4 39.2	30	1.0	90	2.9	150	4.9
31	4 52.8	4 53.6	4 39.4	31	1.0	91	3.0	151	4.9
32	4 53.0	4 53.8	4 39.7	32	1.0	92	3.0	152	4.9
33	4 53.3	4 54.1	4 39.9	33	1.1	93	3.0	153	5.0
34	4 53.5	4 54.3	4 40.1	34	1.1	94	3.1	154	5.0
35	4 53.8	4 54.6	4 40.4	35	1.1	95	3.1	155	5.0
36	4 54.0	4 54.8	4 40.6	36	1.2	96	3.1	156	5.1
37	4 54.3	4 55.1	4 40.8	37	1.2	97	3.2	157	5.1
38	4 54.5	4 55.3	4 41.1	38	1.2	98	3.2	158	5.1
39	4 54.8	4 55.6	4 41.3	39	1.3	99	3.2	159	5.2
40	4 55.0	4 55.8	4 41.6	40	1.3	100	3.3	160	5.2
41	4 55.3	4 56.1	4 41.8	41	1.3	101	3.3	161	5.2
42	4 55.5	4 56.3	4 42.0	42	1.4	102	3.3	162	5.3
43	4 55.8	4 56.6	4 42.3	43	1.4	103	3.3	163	5.3
44	4 56.0	4 56.8	4 42.5	44	1.4	104	3.4	164	5.3
45	4 56.3	4 57.1	4 42.8	45	1.5	105	3.4	165	5.4
46	4 56.5	4 57.3	4 43.0	46	1.5	106	3.4	166	5.4
47	4 56.8	4 57.6	4 43.2	47	1.5	107	3.5	167	5.4
48	4 57.0	4 57.8	4 43.5	48	1.6	108	3.5	168	5.5
49	4 57.3	4 58.1	4 43.7	49	1.6	109	3.5	169	5.5
50	4 57.5	4 58.3	4 43.9	50	1.6	110	3.6	170	5.5
51	4 57.8	4 58.6	4 44.2	51	1.7	111	3.6	171	5.6
52	4 58.0	4 58.8	4 44.4	52	1.7	112	3.6	172	5.6
53	4 58.3	4 59.1	4 44.7	53	1.7	113	3.7	173	5.6
54	4 58.5	4 59.3	4 44.9	54	1.8	114	3.7	174	5.7
55	4 58.8	4 59.6	4 45.1	55	1.8	115	3.7	175	5.7
56	4 59.0	4 59.8	4 45.4	56	1.8	116	3.8	176	5.7
57	4 59.3	5 .1	4 45.6	57	1.9	117	3.8	177	5.8
58	4 59.5	5 .3	4 45.9	58	1.9	118	3.8	178	5.8
59	4 59.8	5 .6	4 46.1	59	1.9	119	3.9	179	5.8
60	5 .0	5 .8	4 46.3	60	2.0	120	3.9	180	5.9

0 h 20 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 .0	5 .8	4 46.3	0	.0	60	2.1	120	4.1
1	5 .3	5 1.1	4 46.6	1	.0	61	2.1	121	4.1
2	5 .5	5 1.3	4 46.8	2	.1	62	2.1	122	4.2
3	5 .8	5 1.6	4 47.0	3	.1	63	2.2	123	4.2
4	5 1.0	5 1.8	4 47.3	4	.1	64	2.2	124	4.2
5	5 1.3	5 2.1	4 47.5	5	.2	65	2.2	125	4.3
6	5 1.5	5 2.3	4 47.8	6	.2	66	2.3	126	4.3
7	5 1.8	5 2.6	4 48.0	7	.2	67	2.3	127	4.3
8	5 2.0	5 2.8	4 48.2	8	.3	68	2.3	128	4.4
9	5 2.3	5 3.1	4 48.5	9	.3	69	2.4	129	4.4
10	5 2.5	5 3.3	4 48.7	10	.3	70	2.4	130	4.4
11	5 2.8	5 3.6	4 49.0	11	.4	71	2.4	131	4.5
12	5 3.0	5 3.8	4 49.2	12	.4	72	2.5	132	4.5
13	5 3.3	5 4.1	4 49.4	13	.4	73	2.5	133	4.5
14	5 3.5	5 4.3	4 49.7	14	.5	74	2.5	134	4.6
15	5 3.8	5 4.6	4 49.9	15	.5	75	2.6	135	4.6
16	5 4.0	5 4.8	4 50.2	16	.5	76	2.6	136	4.6
17	5 4.3	5 5.1	4 50.4	17	.6	77	2.6	137	4.7
18	5 4.5	5 5.3	4 50.6	18	.6	78	2.7	138	4.7
19	5 4.8	5 5.6	4 50.9	19	.6	79	2.7	139	4.7
20	5 5.0	5 5.8	4 51.1	20	.7	80	2.7	140	4.8
21	5 5.3	5 6.1	4 51.3	21	.7	81	2.8	141	4.8
22	5 5.5	5 6.3	4 51.6	22	.8	82	2.8	142	4.9
23	5 5.8	5 6.6	4 51.8	23	.8	83	2.8	143	4.9
24	5 6.0	5 6.9	4 52.1	24	.8	84	2.9	144	4.9
25	5 6.3	5 7.1	4 52.3	25	.9	85	2.9	145	5.0
26	5 6.5	5 7.4	4 52.5	26	.9	86	2.9	146	5.0
27	5 6.8	5 7.6	4 52.8	27	.9	87	3.0	147	5.0
28	5 7.0	5 7.9	4 53.0	28	1.0	88	3.0	148	5.1
29	5 7.3	5 8.1	4 53.3	29	1.0	89	3.0	149	5.1
30	5 7.5	5 8.4	4 53.5	30	1.0	90	3.1	150	5.1
31	5 7.8	5 8.6	4 53.7	31	1.1	91	3.1	151	5.2
32	5 8.0	5 8.9	4 54.0	32	1.1	92	3.1	152	5.2
33	5 8.3	5 9.1	4 54.2	33	1.1	93	3.2	153	5.2
34	5 8.5	5 9.4	4 54.4	34	1.2	94	3.2	154	5.3
35	5 8.8	5 9.6	4 54.7	35	1.2	95	3.2	155	5.3
36	5 9.0	5 9.9	4 54.9	36	1.2	96	3.3	156	5.3
37	5 9.3	5 10.1	4 55.2	37	1.3	97	3.3	157	5.4
38	5 9.5	5 10.4	4 55.4	38	1.3	98	3.3	158	5.4
39	5 9.8	5 10.6	4 55.6	39	1.3	99	3.4	159	5.4
40	5 10.0	5 10.9	4 55.9	40	1.4	100	3.4	160	5.5
41	5 10.3	5 11.1	4 56.1	41	1.4	101	3.5	161	5.5
42	5 10.5	5 11.4	4 56.4	42	1.4	102	3.5	162	5.5
43	5 10.8	5 11.6	4 56.6	43	1.5	103	3.5	163	5.6
44	5 11.0	5 11.9	4 56.8	44	1.5	104	3.6	164	5.6
45	5 11.3	5 12.1	4 57.1	45	1.5	105	3.6	165	5.6
46	5 11.5	5 12.4	4 57.3	46	1.6	106	3.6	166	5.7
47	5 11.8	5 12.6	4 57.5	47	1.6	107	3.7	167	5.7
48	5 12.0	5 12.9	4 57.8	48	1.6	108	3.7	168	5.7
49	5 12.3	5 13.1	4 58.0	49	1.7	109	3.7	169	5.8
50	5 12.5	5 13.4	4 58.3	50	1.7	110	3.8	170	5.8
51	5 12.8	5 13.6	4 58.5	51	1.7	111	3.8	171	5.8
52	5 13.0	5 13.9	4 58.7	52	1.8	112	3.8	172	5.9
53	5 13.3	5 14.1	4 59.0	53	1.8	113	3.9	173	5.9
54	5 13.5	5 14.4	4 59.2	54	1.8	114	3.9	174	5.9
55	5 13.8	5 14.6	4 59.5	55	1.9	115	3.9	175	6.0
56	5 14.0	5 14.9	4 59.7	56	1.9	116	4.0	176	6.0
57	5 14.3	5 15.1	4 59.9	57	1.9	117	4.0	177	6.0
58	5 14.5	5 15.4	5 .2	58	2.0	118	4.0	178	6.1
59	5 14.8	5 15.6	5 .4	59	2.0	119	4.1	179	6.1
60	5 15.0	5 15.9	5 .7	60	2.1	120	4.1	180	6.2

0 h 21 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 15.0	5 15.9	5 .7	0	.0	60	2.2	120	4.3
1	5 15.3	5 16.1	5 .9	1	.0	61	2.2	121	4.3
2	5 15.5	5 16.4	5 1.1	2	.1	62	2.2	122	4.4
3	5 15.8	5 16.6	5 1.4	3	.1	63	2.3	123	4.4
4	5 16.0	5 16.9	5 1.6	4	.1	64	2.3	124	4.4
5	5 16.3	5 17.1	5 1.8	5	.2	65	2.3	125	4.5
6	5 16.5	5 17.4	5 2.1	6	.2	66	2.4	126	4.5
7	5 16.8	5 17.6	5 2.3	7	.3	67	2.4	127	4.6
8	5 17.0	5 17.9	5 2.6	8	.3	68	2.4	128	4.6
9	5 17.3	5 18.1	5 2.8	9	.3	69	2.5	129	4.6
10	5 17.5	5 18.4	5 3.0	10	.4	70	2.5	130	4.7
11	5 17.8	5 18.6	5 3.3	11	.4	71	2.5	131	4.7
12	5 18.0	5 18.9	5 3.5	12	.4	72	2.6	132	4.7
13	5 18.3	5 19.1	5 3.8	13	.5	73	2.6	133	4.8
14	5 18.5	5 19.4	5 4.0	14	.5	74	2.7	134	4.8
15	5 18.8	5 19.6	5 4.2	15	.5	75	2.7	135	4.8
16	5 19.0	5 19.9	5 4.5	16	.6	76	2.7	136	4.9
17	5 19.3	5 20.1	5 4.7	17	.6	77	2.8	137	4.9
18	5 19.5	5 20.4	5 4.9	18	.6	78	2.8	138	4.9
19	5 19.8	5 20.6	5 5.2	19	.7	79	2.8	139	5.0
20	5 20.0	5 20.9	5 5.4	20	.7	80	2.9	140	5.0
21	5 20.3	5 21.1	5 5.7	21	.8	81	2.9	141	5.1
22	5 20.5	5 21.4	5 5.9	22	.8	82	2.9	142	5.1
23	5 20.8	5 21.6	5 6.1	23	.8	83	3.0	143	5.1
24	5 21.0	5 21.9	5 6.4	24	.9	84	3.0	144	5.2
25	5 21.3	5 22.1	5 6.6	25	.9	85	3.0	145	5.2
26	5 21.5	5 22.4	5 6.9	26	.9	86	3.1	146	5.2
27	5 21.8	5 22.6	5 7.1	27	1.0	87	3.1	147	5.3
28	5 22.0	5 22.9	5 7.3	28	1.0	88	3.2	148	5.3
29	5 22.3	5 23.1	5 7.6	29	1.0	89	3.2	149	5.3
30	5 22.5	5 23.4	5 7.8	30	1.1	90	3.2	150	5.4
31	5 22.8	5 23.6	5 8.0	31	1.1	91	3.3	151	5.4
32	5 23.0	5 23.9	5 8.3	32	1.1	92	3.3	152	5.4
33	5 23.3	5 24.1	5 8.5	33	1.2	93	3.3	153	5.5
34	5 23.5	5 24.4	5 8.8	34	1.2	94	3.4	154	5.5
35	5 23.8	5 24.6	5 9.0	35	1.3	95	3.4	155	5.6
36	5 24.0	5 24.9	5 9.2	36	1.3	96	3.4	156	5.6
37	5 24.3	5 25.2	5 9.5	37	1.3	97	3.5	157	5.6
38	5 24.5	5 25.4	5 9.7	38	1.4	98	3.5	158	5.7
39	5 24.8	5 25.7	5 10.0	39	1.4	99	3.5	159	5.7
40	5 25.0	5 25.9	5 10.2	40	1.4	100	3.6	160	5.7
41	5 25.3	5 26.2	5 10.4	41	1.5	101	3.6	161	5.8
42	5 25.5	5 26.4	5 10.7	42	1.5	102	3.7	162	5.8
43	5 25.8	5 26.7	5 10.9	43	1.5	103	3.7	163	5.8
44	5 26.0	5 26.9	5 11.1	44	1.6	104	3.7	164	5.9
45	5 26.3	5 27.2	5 11.4	45	1.6	105	3.8	165	5.9
46	5 26.5	5 27.4	5 11.6	46	1.6	106	3.8	166	5.9
47	5 26.8	5 27.7	5 11.9	47	1.7	107	3.8	167	6.0
48	5 27.0	5 27.9	5 12.1	48	1.7	108	3.9	168	6.0
49	5 27.3	5 28.2	5 12.3	49	1.8	109	3.9	169	6.1
50	5 27.5	5 28.4	5 12.6	50	1.8	110	3.9	170	6.1
51	5 27.8	5 28.7	5 12.8	51	1.8	111	4.0	171	6.1
52	5 28.0	5 28.9	5 13.1	52	1.9	112	4.0	172	6.2
53	5 28.3	5 29.2	5 13.3	53	1.9	113	4.0	173	6.2
54	5 28.5	5 29.4	5 13.5	54	1.9	114	4.1	174	6.2
55	5 28.8	5 29.7	5 13.8	55	2.0	115	4.1	175	6.3
56	5 29.0	5 29.9	5 14.0	56	2.0	116	4.2	176	6.3
57	5 29.3	5 30.2	5 14.3	57	2.0	117	4.2	177	6.3
58	5 29.5	5 30.4	5 14.5	58	2.1	118	4.2	178	6.4
59	5 29.8	5 30.7	5 14.7	59	2.1	119	4.3	179	6.4
60	5 30.0	5 30.9	5 15.0	60	2.2	120	4.3	180	6.5

0 h 22 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 30.0	5 30.9	5 15.0	0	.0	60	2.3	120	4.5
1	5 30.3	5 31.2	5 15.2	1	.0	61	2.3	121	4.5
2	5 30.5	5 31.4	5 15.4	2	.1	62	2.3	122	4.6
3	5 30.8	5 31.7	5 15.7	3	.1	63	2.4	123	4.6
4	5 31.0	5 31.9	5 15.9	4	.2	64	2.4	124	4.7
5	5 31.3	5 32.2	5 16.2	5	.2	65	2.4	125	4.7
6	5 31.5	5 32.4	5 16.4	6	.2	66	2.5	126	4.7
7	5 31.8	5 32.7	5 16.6	7	.3	67	2.5	127	4.8
8	5 32.0	5 32.9	5 16.9	8	.3	68	2.6	128	4.8
9	5 32.3	5 33.2	5 17.1	9	.3	69	2.6	129	4.8
10	5 32.5	5 33.4	5 17.4	10	.4	70	2.6	130	4.9
11	5 32.8	5 33.7	5 17.6	11	.4	71	2.7	131	4.9
12	5 33.0	5 33.9	5 17.8	12	.5	72	2.7	132	5.0
13	5 33.3	5 34.2	5 18.1	13	.5	73	2.7	133	5.0
14	5 33.5	5 34.4	5 18.3	14	.5	74	2.8	134	5.0
15	5 33.8	5 34.7	5 18.5	15	.6	75	2.8	135	5.1
16	5 34.0	5 34.9	5 18.8	16	.6	76	2.9	136	5.1
17	5 34.3	5 35.2	5 19.0	17	.6	77	2.9	137	5.1
18	5 34.5	5 35.4	5 19.3	18	.7	78	2.9	138	5.2
19	5 34.8	5 35.7	5 19.5	19	.7	79	3.0	139	5.2
20	5 35.0	5 35.9	5 19.7	20	.8	80	3.0	140	5.3
21	5 35.3	5 36.2	5 20.0	21	.8	81	3.0	141	5.3
22	5 35.5	5 36.4	5 20.2	22	.8	82	3.1	142	5.3
23	5 35.8	5 36.7	5 20.5	23	.9	83	3.1	143	5.4
24	5 36.0	5 36.9	5 20.7	24	.9	84	3.2	144	5.4
25	5 36.3	5 37.2	5 20.9	25	.9	85	3.2	145	5.4
26	5 36.5	5 37.4	5 21.2	26	1.0	86	3.2	146	5.5
27	5 36.8	5 37.7	5 21.4	27	1.0	87	3.3	147	5.5
28	5 37.0	5 37.9	5 21.6	28	1.1	88	3.3	148	5.6
29	5 37.3	5 38.2	5 21.9	29	1.1	89	3.3	149	5.6
30	5 37.5	5 38.4	5 22.1	30	1.1	90	3.4	150	5.6
31	5 37.8	5 38.7	5 22.4	31	1.2	91	3.4	151	5.7
32	5 38.0	5 38.9	5 22.6	32	1.2	92	3.5	152	5.7
33	5 38.3	5 39.2	5 22.8	33	1.2	93	3.5	153	5.7
34	5 38.5	5 39.4	5 23.1	34	1.3	94	3.5	154	5.8
35	5 38.8	5 39.7	5 23.3	35	1.3	95	3.6	155	5.8
36	5 39.0	5 39.9	5 23.6	36	1.4	96	3.6	156	5.9
37	5 39.3	5 40.2	5 23.8	37	1.4	97	3.6	157	5.9
38	5 39.5	5 40.4	5 24.0	38	1.4	98	3.7	158	5.9
39	5 39.8	5 40.7	5 24.3	39	1.5	99	3.7	159	6.0
40	5 40.0	5 40.9	5 24.5	40	1.5	100	3.8	160	6.0
41	5 40.3	5 41.2	5 24.7	41	1.5	101	3.8	161	6.0
42	5 40.5	5 41.4	5 25.0	42	1.6	102	3.8	162	6.1
43	5 40.8	5 41.7	5 25.2	43	1.6	103	3.9	163	6.1
44	5 41.0	5 41.9	5 25.5	44	1.7	104	3.9	164	6.2
45	5 41.3	5 42.2	5 25.7	45	1.7	105	3.9	165	6.2
46	5 41.5	5 42.4	5 25.9	46	1.7	106	4.0	166	6.2
47	5 41.8	5 42.7	5 26.2	47	1.8	107	4.0	167	6.3
48	5 42.0	5 43.0	5 26.4	48	1.8	108	4.1	168	6.3
49	5 42.3	5 43.2	5 26.7	49	1.8	109	4.1	169	6.3
50	5 42.5	5 43.5	5 26.9	50	1.9	110	4.1	170	6.4
51	5 42.8	5 43.7	5 27.1	51	1.9	111	4.2	171	6.4
52	5 43.0	5 44.0	5 27.4	52	2.0	112	4.2	172	6.5
53	5 43.3	5 44.2	5 27.6	53	2.0	113	4.2	173	6.5
54	5 43.5	5 44.5	5 27.9	54	2.0	114	4.3	174	6.5
55	5 43.8	5 44.7	5 28.1	55	2.1	115	4.3	175	6.6
56	5 44.0	5 45.0	5 28.3	56	2.1	116	4.4	176	6.6
57	5 44.3	5 45.2	5 28.6	57	2.1	117	4.4	177	6.6
58	5 44.5	5 45.5	5 28.8	58	2.2	118	4.4	178	6.7
59	5 44.8	5 45.7	5 29.0	59	2.2	119	4.5	179	6.7
60	5 45.0	5 46.0	5 29.3	60	2.3	120	4.5	180	6.8

0 h 23 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	5 45.0	5 46.0	5 29.3	0	.0	60	2.4	120	4.7
1	5 45.3	5 46.2	5 29.5	1	.0	61	2.4	121	4.7
2	5 45.5	5 46.5	5 29.8	2	.1	62	2.4	122	4.8
3	5 45.8	5 46.7	5 30.0	3	.1	63	2.5	123	4.8
4	5 46.0	5 47.0	5 30.2	4	.2	64	2.5	124	4.9
5	5 46.3	5 47.2	5 30.5	5	.2	65	2.5	125	4.9
6	5 46.5	5 47.5	5 30.7	6	.2	66	2.6	126	4.9
7	5 46.8	5 47.7	5 31.0	7	.3	67	2.6	127	5.0
8	5 47.0	5 48.0	5 31.2	8	.3	68	2.7	128	5.0
9	5 47.3	5 48.2	5 31.4	9	.4	69	2.7	129	5.1
10	5 47.5	5 48.5	5 31.7	10	.4	70	2.7	130	5.1
11	5 47.8	5 48.7	5 31.9	11	.4	71	2.8	131	5.1
12	5 48.0	5 49.0	5 32.1	12	.5	72	2.8	132	5.2
13	5 48.3	5 49.2	5 32.4	13	.5	73	2.9	133	5.2
14	5 48.5	5 49.5	5 32.6	14	.5	74	2.9	134	5.2
15	5 48.8	5 49.7	5 32.9	15	.6	75	2.9	135	5.3
16	5 49.0	5 50.0	5 33.1	16	.6	76	3.0	136	5.3
17	5 49.3	5 50.2	5 33.3	17	.7	77	3.0	137	5.4
18	5 49.5	5 50.5	5 33.6	18	.7	78	3.1	138	5.4
19	5 49.8	5 50.7	5 33.8	19	.7	79	3.1	139	5.4
20	5 50.0	5 51.0	5 34.1	20	.8	80	3.1	140	5.5
21	5 50.3	5 51.2	5 34.3	21	.8	81	3.2	141	5.5
22	5 50.5	5 51.5	5 34.5	22	.9	82	3.2	142	5.6
23	5 50.8	5 51.7	5 34.8	23	.9	83	3.3	143	5.6
24	5 51.0	5 52.0	5 35.0	24	.9	84	3.3	144	5.6
25	5 51.3	5 52.2	5 35.2	25	1.0	85	3.3	145	5.7
26	5 51.5	5 52.5	5 35.5	26	1.0	86	3.4	146	5.7
27	5 51.8	5 52.7	5 35.7	27	1.1	87	3.4	147	5.8
28	5 52.0	5 53.0	5 36.0	28	1.1	88	3.4	148	5.8
29	5 52.3	5 53.2	5 36.2	29	1.1	89	3.5	149	5.8
30	5 52.5	5 53.5	5 36.4	30	1.2	90	3.5	150	5.9
31	5 52.8	5 53.7	5 36.7	31	1.2	91	3.6	151	5.9
32	5 53.0	5 54.0	5 36.9	32	1.3	92	3.6	152	6.0
33	5 53.3	5 54.2	5 37.2	33	1.3	93	3.6	153	6.0
34	5 53.5	5 54.5	5 37.4	34	1.3	94	3.7	154	6.0
35	5 53.8	5 54.7	5 37.6	35	1.4	95	3.7	155	6.1
36	5 54.0	5 55.0	5 37.9	36	1.4	96	3.8	156	6.1
37	5 54.3	5 55.2	5 38.1	37	1.4	97	3.8	157	6.1
38	5 54.5	5 55.5	5 38.4	38	1.5	98	3.8	158	6.2
39	5 54.8	5 55.7	5 38.6	39	1.5	99	3.9	159	6.2
40	5 55.0	5 56.0	5 38.8	40	1.6	100	3.9	160	6.3
41	5 55.3	5 56.2	5 39.1	41	1.6	101	4.0	161	6.3
42	5 55.5	5 56.5	5 39.3	42	1.6	102	4.0	162	6.3
43	5 55.8	5 56.7	5 39.5	43	1.7	103	4.0	163	6.4
44	5 56.0	5 57.0	5 39.8	44	1.7	104	4.1	164	6.4
45	5 56.3	5 57.2	5 40.0	45	1.8	105	4.1	165	6.5
46	5 56.5	5 57.5	5 40.3	46	1.8	106	4.2	166	6.5
47	5 56.8	5 57.7	5 40.5	47	1.8	107	4.2	167	6.5
48	5 57.0	5 58.0	5 40.7	48	1.9	108	4.2	168	6.6
49	5 57.3	5 58.2	5 41.0	49	1.9	109	4.3	169	6.6
50	5 57.5	5 58.5	5 41.2	50	2.0	110	4.3	170	6.7
51	5 57.8	5 58.7	5 41.5	51	2.0	111	4.3	171	6.7
52	5 58.0	5 59.0	5 41.7	52	2.0	112	4.4	172	6.7
53	5 58.3	5 59.2	5 41.9	53	2.1	113	4.4	173	6.8
54	5 58.5	5 59.5	5 42.2	54	2.1	114	4.5	174	6.8
55	5 58.8	5 59.7	5 42.4	55	2.2	115	4.5	175	6.9
56	5 59.0	5 60.0	5 42.6	56	2.2	116	4.5	176	6.9
57	5 59.3	6 .2	5 42.9	57	2.2	117	4.6	177	6.9
58	5 59.5	6 .5	5 43.1	58	2.3	118	4.6	178	7.0
59	5 59.8	6 .7	5 43.4	59	2.3	119	4.7	179	7.0
60	6 .0	6 1.0	5 43.6	60	2.4	120	4.7	180	7.1

0 h 24 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 .0	6 1.0	5 43.6	0	.0	60	2.5	120	4.9
1	6 .3	6 1.3	5 43.8	1	.0	61	2.5	121	4.9
2	6 .5	6 1.5	5 44.1	2	.1	62	2.5	122	5.0
3	6 .8	6 1.8	5 44.3	3	.1	63	2.6	123	5.0
4	6 1.0	6 2.0	5 44.6	4	.2	64	2.6	124	5.1
5	6 1.3	6 2.3	5 44.8	5	.2	65	2.7	125	5.1
6	6 1.5	6 2.5	5 45.0	6	.2	66	2.7	126	5.1
7	6 1.8	6 2.8	5 45.3	7	.3	67	2.7	127	5.2
8	6 2.0	6 3.0	5 45.5	8	.3	68	2.8	128	5.2
9	6 2.3	6 3.3	5 45.7	9	.4	69	2.8	129	5.3
10	6 2.5	6 3.5	5 46.0	10	.4	70	2.9	130	5.3
11	6 2.8	6 3.8	5 46.2	11	.4	71	2.9	131	5.3
12	6 3.0	6 4.0	5 46.5	12	.5	72	2.9	132	5.4
13	6 3.3	6 4.3	5 46.7	13	.5	73	3.0	133	5.4
14	6 3.5	6 4.5	5 46.9	14	.6	74	3.0	134	5.5
15	6 3.8	6 4.8	5 47.2	15	.6	75	3.1	135	5.5
16	6 4.0	6 5.0	5 47.4	16	.7	76	3.1	136	5.6
17	6 4.3	6 5.3	5 47.7	17	.7	77	3.1	137	5.6
18	6 4.5	6 5.5	5 47.9	18	.7	78	3.2	138	5.6
19	6 4.8	6 5.8	5 48.1	19	.8	79	3.2	139	5.7
20	6 5.0	6 6.0	5 48.4	20	.8	80	3.3	140	5.7
21	6 5.3	6 6.3	5 48.6	21	.9	81	3.3	141	5.8
22	6 5.5	6 6.5	5 48.8	22	.9	82	3.3	142	5.8
23	6 5.8	6 6.8	5 49.1	23	.9	83	3.4	143	5.8
24	6 6.0	6 7.0	5 49.3	24	1.0	84	3.4	144	5.9
25	6 6.3	6 7.3	5 49.6	25	1.0	85	3.5	145	5.9
26	6 6.5	6 7.5	5 49.8	26	1.1	86	3.5	146	6.0
27	6 6.8	6 7.8	5 50.0	27	1.1	87	3.6	147	6.0
28	6 7.0	6 8.0	5 50.3	28	1.1	88	3.6	148	6.0
29	6 7.3	6 8.3	5 50.5	29	1.2	89	3.6	149	6.1
30	6 7.5	6 8.5	5 50.8	30	1.2	90	3.7	150	6.1
31	6 7.8	6 8.8	5 51.0	31	1.3	91	3.7	151	6.2
32	6 8.0	6 9.0	5 51.2	32	1.3	92	3.8	152	6.2
33	6 8.3	6 9.3	5 51.5	33	1.3	93	3.8	153	6.2
34	6 8.5	6 9.5	5 51.7	34	1.4	94	3.8	154	6.3
35	6 8.8	6 9.8	5 52.0	35	1.4	95	3.9	155	6.3
36	6 9.0	6 10.0	5 52.2	36	1.5	96	3.9	156	6.4
37	6 9.3	6 10.3	5 52.4	37	1.5	97	4.0	157	6.4
38	6 9.5	6 10.5	5 52.7	38	1.6	98	4.0	158	6.5
39	6 9.8	6 10.8	5 52.9	39	1.6	99	4.0	159	6.5
40	6 10.0	6 11.0	5 53.1	40	1.6	100	4.1	160	6.5
41	6 10.3	6 11.3	5 53.4	41	1.7	101	4.1	161	6.6
42	6 10.5	6 11.5	5 53.6	42	1.7	102	4.2	162	6.6
43	6 10.8	6 11.8	5 53.9	43	1.8	103	4.2	163	6.7
44	6 11.0	6 12.0	5 54.1	44	1.8	104	4.2	164	6.7
45	6 11.3	6 12.3	5 54.3	45	1.8	105	4.3	165	6.7
46	6 11.5	6 12.5	5 54.6	46	1.9	106	4.3	166	6.8
47	6 11.8	6 12.8	5 54.8	47	1.9	107	4.4	167	6.8
48	6 12.0	6 13.0	5 55.1	48	2.0	108	4.4	168	6.9
49	6 12.3	6 13.3	5 55.3	49	2.0	109	4.5	169	6.9
50	6 12.5	6 13.5	5 55.5	50	2.0	110	4.5	170	6.9
51	6 12.8	6 13.8	5 55.8	51	2.1	111	4.5	171	7.0
52	6 13.0	6 14.0	5 56.0	52	2.1	112	4.6	172	7.0
53	6 13.3	6 14.3	5 56.2	53	2.2	113	4.6	173	7.1
54	6 13.5	6 14.5	5 56.5	54	2.2	114	4.7	174	7.1
55	6 13.8	6 14.8	5 56.7	55	2.2	115	4.7	175	7.1
56	6 14.0	6 15.0	5 57.0	56	2.3	116	4.7	176	7.2
57	6 14.3	6 15.3	5 57.2	57	2.3	117	4.8	177	7.2
58	6 14.5	6 15.5	5 57.4	58	2.4	118	4.8	178	7.3
59	6 14.8	6 15.8	5 57.7	59	2.4	119	4.9	179	7.3
60	6 15.0	6 16.0	5 57.9	60	2.5	120	4.9	180	7.4

0 h 25 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 15.0	6 16.0	5 57.9	0	.0	60	2.6	120	5.1
1	6 15.3	6 16.3	5 58.2	1	.0	61	2.6	121	5.1
2	6 15.5	6 16.5	5 58.4	2	.1	62	2.6	122	5.2
3	6 15.8	6 16.8	5 58.6	3	.1	63	2.7	123	5.2
4	6 16.0	6 17.0	5 58.9	4	.2	64	2.7	124	5.3
5	6 16.3	6 17.3	5 59.1	5	.2	65	2.8	125	5.3
6	6 16.5	6 17.5	5 59.3	6	.3	66	2.8	126	5.4
7	6 16.8	6 17.8	5 59.6	7	.3	67	2.8	127	5.4
8	6 17.0	6 18.0	5 59.8	8	.3	68	2.9	128	5.4
9	6 17.3	6 18.3	6 .1	9	.4	69	2.9	129	5.5
10	6 17.5	6 18.5	6 .3	10	.4	70	3.0	130	5.5
11	6 17.8	6 18.8	6 .5	11	.5	71	3.0	131	5.6
12	6 18.0	6 19.1	6 .8	12	.5	72	3.1	132	5.6
13	6 18.3	6 19.3	6 1.0	13	.6	73	3.1	133	5.7
14	6 18.5	6 19.6	6 1.3	14	.6	74	3.1	134	5.7
15	6 18.8	6 19.8	6 1.5	15	.6	75	3.2	135	5.7
16	6 19.0	6 20.1	6 1.7	16	.7	76	3.2	136	5.8
17	6 19.3	6 20.3	6 2.0	17	.7	77	3.3	137	5.8
18	6 19.5	6 20.6	6 2.2	18	.8	78	3.3	138	5.9
19	6 19.8	6 20.8	6 2.5	19	.8	79	3.4	139	5.9
20	6 20.0	6 21.1	6 2.7	20	.9	80	3.4	140	6.0
21	6 20.3	6 21.3	6 2.9	21	.9	81	3.4	141	6.0
22	6 20.5	6 21.6	6 3.2	22	.9	82	3.5	142	6.0
23	6 20.8	6 21.8	6 3.4	23	1.0	83	3.5	143	6.1
24	6 21.0	6 22.1	6 3.6	24	1.0	84	3.6	144	6.1
25	6 21.3	6 22.3	6 3.9	25	1.1	85	3.6	145	6.2
26	6 21.5	6 22.6	6 4.1	26	1.1	86	3.7	146	6.2
27	6 21.8	6 22.8	6 4.4	27	1.1	87	3.7	147	6.2
28	6 22.0	6 23.1	6 4.6	28	1.2	88	3.7	148	6.3
29	6 22.3	6 23.3	6 4.8	29	1.2	89	3.8	149	6.3
30	6 22.5	6 23.6	6 5.1	30	1.3	90	3.8	150	6.4
31	6 22.8	6 23.8	6 5.3	31	1.3	91	3.9	151	6.4
32	6 23.0	6 24.1	6 5.6	32	1.4	92	3.9	152	6.5
33	6 23.3	6 24.3	6 5.8	33	1.4	93	4.0	153	6.5
34	6 23.5	6 24.6	6 6.0	34	1.4	94	4.0	154	6.5
35	6 23.8	6 24.8	6 6.3	35	1.5	95	4.0	155	6.6
36	6 24.0	6 25.1	6 6.5	36	1.5	96	4.1	156	6.6
37	6 24.3	6 25.3	6 6.7	37	1.6	97	4.1	157	6.7
38	6 24.5	6 25.6	6 7.0	38	1.6	98	4.2	158	6.7
39	6 24.8	6 25.8	6 7.2	39	1.7	99	4.2	159	6.8
40	6 25.0	6 26.1	6 7.5	40	1.7	100	4.3	160	6.8
41	6 25.3	6 26.3	6 7.7	41	1.7	101	4.3	161	6.8
42	6 25.5	6 26.6	6 7.9	42	1.8	102	4.3	162	6.9
43	6 25.8	6 26.8	6 8.2	43	1.8	103	4.4	163	6.9
44	6 26.0	6 27.1	6 8.4	44	1.9	104	4.4	164	7.0
45	6 26.3	6 27.3	6 8.7	45	1.9	105	4.5	165	7.0
46	6 26.5	6 27.6	6 8.9	46	2.0	106	4.5	166	7.1
47	6 26.8	6 27.8	6 9.1	47	2.0	107	4.5	167	7.1
48	6 27.0	6 28.1	6 9.4	48	2.0	108	4.6	168	7.1
49	6 27.3	6 28.3	6 9.6	49	2.1	109	4.6	169	7.2
50	6 27.5	6 28.6	6 9.8	50	2.1	110	4.7	170	7.2
51	6 27.8	6 28.8	6 10.1	51	2.2	111	4.7	171	7.3
52	6 28.0	6 29.1	6 10.3	52	2.2	112	4.8	172	7.3
53	6 28.3	6 29.3	6 10.6	53	2.3	113	4.8	173	7.4
54	6 28.5	6 29.6	6 10.8	54	2.3	114	4.8	174	7.4
55	6 28.8	6 29.8	6 11.0	55	2.3	115	4.9	175	7.4
56	6 29.0	6 30.1	6 11.3	56	2.4	116	4.9	176	7.5
57	6 29.3	6 30.3	6 11.5	57	2.4	117	5.0	177	7.5
58	6 29.5	6 30.6	6 11.8	58	2.5	118	5.0	178	7.6
59	6 29.8	6 30.8	6 12.0	59	2.5	119	5.1	179	7.6
60	6 30.0	6 31.1	6 12.2	60	2.6	120	5.1	180	7.7

0 h 26 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 30.0	6 31.1	6 12.2	0	.0	60	2.7	120	5.3
1	6 30.3	6 31.3	6 12.5	1	.0	61	2.7	121	5.3
2	6 30.5	6 31.6	6 12.7	2	.1	62	2.7	122	5.4
3	6 30.8	6 31.8	6 12.9	3	.1	63	2.8	123	5.4
4	6 31.0	6 32.1	6 13.2	4	.2	64	2.8	124	5.5
5	6 31.3	6 32.3	6 13.4	5	.2	65	2.9	125	5.5
6	6 31.5	6 32.6	6 13.7	6	.3	66	2.9	126	5.6
7	6 31.8	6 32.8	6 13.9	7	.3	67	3.0	127	5.6
8	6 32.0	6 33.1	6 14.1	8	.4	68	3.0	128	5.7
9	6 32.3	6 33.3	6 14.4	9	.4	69	3.0	129	5.7
10	6 32.5	6 33.6	6 14.6	10	.4	70	3.1	130	5.7
11	6 32.8	6 33.8	6 14.9	11	.5	71	3.1	131	5.8
12	6 33.0	6 34.1	6 15.1	12	.5	72	3.2	132	5.8
13	6 33.3	6 34.3	6 15.3	13	.6	73	3.2	133	5.9
14	6 33.5	6 34.6	6 15.6	14	.6	74	3.3	134	5.9
15	6 33.8	6 34.8	6 15.8	15	.7	75	3.3	135	6.0
16	6 34.0	6 35.1	6 16.1	16	.7	76	3.4	136	6.0
17	6 34.3	6 35.3	6 16.3	17	.8	77	3.4	137	6.1
18	6 34.5	6 35.6	6 16.5	18	.8	78	3.4	138	6.1
19	6 34.8	6 35.8	6 16.8	19	.8	79	3.5	139	6.1
20	6 35.0	6 36.1	6 17.0	20	.9	80	3.5	140	6.2
21	6 35.3	6 36.3	6 17.2	21	.9	81	3.6	141	6.2
22	6 35.5	6 36.6	6 17.5	22	1.0	82	3.6	142	6.3
23	6 35.8	6 36.8	6 17.7	23	1.0	83	3.7	143	6.3
24	6 36.0	6 37.1	6 18.0	24	1.1	84	3.7	144	6.4
25	6 36.3	6 37.4	6 18.2	25	1.1	85	3.8	145	6.4
26	6 36.5	6 37.6	6 18.4	26	1.1	86	3.8	146	6.4
27	6 36.8	6 37.9	6 18.7	27	1.2	87	3.8	147	6.5
28	6 37.0	6 38.1	6 18.9	28	1.2	88	3.9	148	6.5
29	6 37.3	6 38.4	6 19.2	29	1.3	89	3.9	149	6.6
30	6 37.5	6 38.6	6 19.4	30	1.3	90	4.0	150	6.6
31	6 37.8	6 38.9	6 19.6	31	1.4	91	4.0	151	6.7
32	6 38.0	6 39.1	6 19.9	32	1.4	92	4.1	152	6.7
33	6 38.3	6 39.4	6 20.1	33	1.5	93	4.1	153	6.8
34	6 38.5	6 39.6	6 20.3	34	1.5	94	4.2	154	6.8
35	6 38.8	6 39.9	6 20.6	35	1.5	95	4.2	155	6.8
36	6 39.0	6 40.1	6 20.8	36	1.6	96	4.2	156	6.9
37	6 39.3	6 40.4	6 21.1	37	1.6	97	4.3	157	6.9
38	6 39.5	6 40.6	6 21.3	38	1.7	98	4.3	158	7.0
39	6 39.8	6 40.9	6 21.5	39	1.7	99	4.4	159	7.0
40	6 40.0	6 41.1	6 21.8	40	1.8	100	4.4	160	7.1
41	6 40.3	6 41.4	6 22.0	41	1.8	101	4.5	161	7.1
42	6 40.5	6 41.6	6 22.3	42	1.9	102	4.5	162	7.2
43	6 40.8	6 41.9	6 22.5	43	1.9	103	4.5	163	7.2
44	6 41.0	6 42.1	6 22.7	44	1.9	104	4.6	164	7.2
45	6 41.3	6 42.4	6 23.0	45	2.0	105	4.6	165	7.3
46	6 41.5	6 42.6	6 23.2	46	2.0	106	4.7	166	7.3
47	6 41.8	6 42.9	6 23.4	47	2.1	107	4.7	167	7.4
48	6 42.0	6 43.1	6 23.7	48	2.1	108	4.8	168	7.4
49	6 42.3	6 43.4	6 23.9	49	2.2	109	4.8	169	7.5
50	6 42.5	6 43.6	6 24.2	50	2.2	110	4.9	170	7.5
51	6 42.8	6 43.9	6 24.4	51	2.3	111	4.9	171	7.6
52	6 43.0	6 44.1	6 24.6	52	2.3	112	4.9	172	7.6
53	6 43.3	6 44.4	6 24.9	53	2.3	113	5.0	173	7.6
54	6 43.5	6 44.6	6 25.1	54	2.4	114	5.0	174	7.7
55	6 43.8	6 44.9	6 25.4	55	2.4	115	5.1	175	7.7
56	6 44.0	6 45.1	6 25.6	56	2.5	116	5.1	176	7.8
57	6 44.3	6 45.4	6 25.8	57	2.5	117	5.2	177	7.8
58	6 44.5	6 45.6	6 26.1	58	2.6	118	5.2	178	7.9
59	6 44.8	6 45.9	6 26.3	59	2.6	119	5.3	179	7.9
60	6 45.0	6 46.1	6 26.6	60	2.7	120	5.3	180	8.0

0 h 27 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	6 45.0	6 46.1	6 26.6	0	.0	60	2.8	120	5.5
1	6 45.3	6 46.4	6 26.8	1	.0	61	2.8	121	5.5
2	6 45.5	6 46.6	6 27.0	2	.1	62	2.8	122	5.6
3	6 45.8	6 46.9	6 27.3	3	.1	63	2.9	123	5.6
4	6 46.0	6 47.1	6 27.5	4	.2	64	2.9	124	5.7
5	6 46.3	6 47.4	6 27.7	5	.2	65	3.0	125	5.7
6	6 46.5	6 47.6	6 28.0	6	.3	66	3.0	126	5.8
7	6 46.8	6 47.9	6 28.2	7	.3	67	3.1	127	5.8
8	6 47.0	6 48.1	6 28.5	8	.4	68	3.1	128	5.9
9	6 47.3	6 48.4	6 28.7	9	.4	69	3.2	129	5.9
10	6 47.5	6 48.6	6 28.9	10	.5	70	3.2	130	6.0
11	6 47.8	6 48.9	6 29.2	11	.5	71	3.3	131	6.0
12	6 48.0	6 49.1	6 29.4	12	.6	72	3.3	132	6.1
13	6 48.3	6 49.4	6 29.7	13	.6	73	3.3	133	6.1
14	6 48.5	6 49.6	6 29.9	14	.6	74	3.4	134	6.1
15	6 48.8	6 49.9	6 30.1	15	.7	75	3.4	135	6.2
16	6 49.0	6 50.1	6 30.4	16	.7	76	3.5	136	6.2
17	6 49.3	6 50.4	6 30.6	17	.8	77	3.5	137	6.3
18	6 49.5	6 50.6	6 30.8	18	.8	78	3.6	138	6.3
19	6 49.8	6 50.9	6 31.1	19	.9	79	3.6	139	6.4
20	6 50.0	6 51.1	6 31.3	20	.9	80	3.7	140	6.4
21	6 50.3	6 51.4	6 31.6	21	1.0	81	3.7	141	6.5
22	6 50.5	6 51.6	6 31.8	22	1.0	82	3.8	142	6.5
23	6 50.8	6 51.9	6 32.0	23	1.1	83	3.8	143	6.6
24	6 51.0	6 52.1	6 32.3	24	1.1	84	3.9	144	6.6
25	6 51.3	6 52.4	6 32.5	25	1.1	85	3.9	145	6.6
26	6 51.5	6 52.6	6 32.8	26	1.2	86	3.9	146	6.7
27	6 51.8	6 52.9	6 33.0	27	1.2	87	4.0	147	6.7
28	6 52.0	6 53.1	6 33.2	28	1.3	88	4.0	148	6.8
29	6 52.3	6 53.4	6 33.5	29	1.3	89	4.1	149	6.8
30	6 52.5	6 53.6	6 33.7	30	1.4	90	4.1	150	6.9
31	6 52.8	6 53.9	6 33.9	31	1.4	91	4.2	151	6.9
32	6 53.0	6 54.1	6 34.2	32	1.5	92	4.2	152	7.0
33	6 53.3	6 54.4	6 34.4	33	1.5	93	4.3	153	7.0
34	6 53.5	6 54.6	6 34.7	34	1.6	94	4.3	154	7.1
35	6 53.8	6 54.9	6 34.9	35	1.6	95	4.4	155	7.1
36	6 54.0	6 55.2	6 35.1	36	1.7	96	4.4	156	7.2
37	6 54.3	6 55.4	6 35.4	37	1.7	97	4.4	157	7.2
38	6 54.5	6 55.7	6 35.6	38	1.7	98	4.5	158	7.2
39	6 54.8	6 55.9	6 35.9	39	1.8	99	4.5	159	7.3
40	6 55.0	6 56.2	6 36.1	40	1.8	100	4.6	160	7.3
41	6 55.3	6 56.4	6 36.3	41	1.9	101	4.6	161	7.4
42	6 55.5	6 56.7	6 36.6	42	1.9	102	4.7	162	7.4
43	6 55.8	6 56.9	6 36.8	43	2.0	103	4.7	163	7.5
44	6 56.0	6 57.2	6 37.0	44	2.0	104	4.8	164	7.5
45	6 56.3	6 57.4	6 37.3	45	2.1	105	4.8	165	7.6
46	6 56.5	6 57.7	6 37.5	46	2.1	106	4.9	166	7.6
47	6 56.8	6 57.9	6 37.8	47	2.2	107	4.9	167	7.7
48	6 57.0	6 58.2	6 38.0	48	2.2	108	5.0	168	7.7
49	6 57.3	6 58.4	6 38.2	49	2.2	109	5.0	169	7.7
50	6 57.5	6 58.7	6 38.5	50	2.3	110	5.0	170	7.8
51	6 57.8	6 58.9	6 38.7	51	2.3	111	5.1	171	7.8
52	6 58.0	6 59.2	6 39.0	52	2.4	112	5.1	172	7.9
53	6 58.3	6 59.4	6 39.2	53	2.4	113	5.2	173	7.9
54	6 58.5	6 59.7	6 39.4	54	2.5	114	5.2	174	8.0
55	6 58.8	6 59.9	6 39.7	55	2.5	115	5.3	175	8.0
56	6 59.0	7 .2	6 39.9	56	2.6	116	5.3	176	8.1
57	6 59.3	7 .4	6 40.2	57	2.6	117	5.4	177	8.1
58	6 59.5	7 .7	6 40.4	58	2.7	118	5.4	178	8.2
59	6 59.8	7 .9	6 40.6	59	2.7	119	5.5	179	8.2
60	7 .0	7 1.2	6 40.9	60	2.8	120	5.5	180	8.3

0 h 28 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 .0	7 1.2	6 40.9	0	.0	60	2.9	120	5.7
1	7 .3	7 1.4	6 41.1	1	.0	61	2.9	121	5.7
2	7 .5	7 1.7	6 41.3	2	.1	62	2.9	122	5.8
3	7 .8	7 1.9	6 41.6	3	.1	63	3.0	123	5.8
4	7 1.0	7 2.2	6 41.8	4	.2	64	3.0	124	5.9
5	7 1.3	7 2.4	6 42.1	5	.2	65	3.1	125	5.9
6	7 1.5	7 2.7	6 42.3	6	.3	66	3.1	126	6.0
7	7 1.8	7 2.9	6 42.5	7	.3	67	3.2	127	6.0
8	7 2.0	7 3.2	6 42.8	8	.4	68	3.2	128	6.1
9	7 2.3	7 3.4	6 43.0	9	.4	69	3.3	129	6.1
10	7 2.5	7 3.7	6 43.3	10	.5	70	3.3	130	6.2
11	7 2.8	7 3.9	6 43.5	11	.5	71	3.4	131	6.2
12	7 3.0	7 4.2	6 43.7	12	.6	72	3.4	132	6.3
13	7 3.3	7 4.4	6 44.0	13	.6	73	3.5	133	6.3
14	7 3.5	7 4.7	6 44.2	14	.7	74	3.5	134	6.4
15	7 3.8	7 4.9	6 44.4	15	.7	75	3.6	135	6.4
16	7 4.0	7 5.2	6 44.7	16	.8	76	3.6	136	6.5
17	7 4.3	7 5.4	6 44.9	17	.8	77	3.7	137	6.5
18	7 4.5	7 5.7	6 45.2	18	.9	78	3.7	138	6.6
19	7 4.8	7 5.9	6 45.4	19	.9	79	3.8	139	6.6
20	7 5.0	7 6.2	6 45.6	20	1.0	80	3.8	140	6.7
21	7 5.3	7 6.4	6 45.9	21	1.0	81	3.8	141	6.7
22	7 5.5	7 6.7	6 46.1	22	1.0	82	3.9	142	6.7
23	7 5.8	7 6.9	6 46.4	23	1.1	83	3.9	143	6.8
24	7 6.0	7 7.2	6 46.6	24	1.1	84	4.0	144	6.8
25	7 6.3	7 7.4	6 46.8	25	1.2	85	4.0	145	6.9
26	7 6.5	7 7.7	6 47.1	26	1.2	86	4.1	146	6.9
27	7 6.8	7 7.9	6 47.3	27	1.3	87	4.1	147	7.0
28	7 7.0	7 8.2	6 47.5	28	1.3	88	4.2	148	7.0
29	7 7.3	7 8.4	6 47.8	29	1.4	89	4.2	149	7.1
30	7 7.5	7 8.7	6 48.0	30	1.4	90	4.3	150	7.1
31	7 7.8	7 8.9	6 48.3	31	1.5	91	4.3	151	7.2
32	7 8.0	7 9.2	6 48.5	32	1.5	92	4.4	152	7.2
33	7 8.3	7 9.4	6 48.7	33	1.6	93	4.4	153	7.3
34	7 8.5	7 9.7	6 49.0	34	1.6	94	4.5	154	7.3
35	7 8.8	7 9.9	6 49.2	35	1.7	95	4.5	155	7.4
36	7 9.0	7 10.2	6 49.5	36	1.7	96	4.6	156	7.4
37	7 9.3	7 10.4	6 49.7	37	1.8	97	4.6	157	7.5
38	7 9.5	7 10.7	6 49.9	38	1.8	98	4.7	158	7.5
39	7 9.8	7 10.9	6 50.2	39	1.9	99	4.7	159	7.6
40	7 10.0	7 11.2	6 50.4	40	1.9	100	4.8	160	7.6
41	7 10.3	7 11.4	6 50.6	41	1.9	101	4.8	161	7.6
42	7 10.5	7 11.7	6 50.9	42	2.0	102	4.8	162	7.7
43	7 10.8	7 11.9	6 51.1	43	2.0	103	4.9	163	7.7
44	7 11.0	7 12.2	6 51.4	44	2.1	104	4.9	164	7.8
45	7 11.3	7 12.4	6 51.6	45	2.1	105	5.0	165	7.8
46	7 11.5	7 12.7	6 51.8	46	2.2	106	5.0	166	7.9
47	7 11.8	7 12.9	6 52.1	47	2.2	107	5.1	167	7.9
48	7 12.0	7 13.2	6 52.3	48	2.3	108	5.1	168	8.0
49	7 12.3	7 13.5	6 52.6	49	2.3	109	5.2	169	8.0
50	7 12.5	7 13.7	6 52.8	50	2.4	110	5.2	170	8.1
51	7 12.8	7 14.0	6 53.0	51	2.4	111	5.3	171	8.1
52	7 13.0	7 14.2	6 53.3	52	2.5	112	5.3	172	8.2
53	7 13.3	7 14.5	6 53.5	53	2.5	113	5.4	173	8.2
54	7 13.5	7 14.7	6 53.8	54	2.6	114	5.4	174	8.3
55	7 13.8	7 15.0	6 54.0	55	2.6	115	5.5	175	8.3
56	7 14.0	7 15.2	6 54.2	56	2.7	116	5.5	176	8.4
57	7 14.3	7 15.5	6 54.5	57	2.7	117	5.6	177	8.4
58	7 14.5	7 15.7	6 54.7	58	2.8	118	5.6	178	8.5
59	7 14.8	7 16.0	6 54.9	59	2.8	119	5.7	179	8.5
60	7 15.0	7 16.2	6 55.2	60	2.9	120	5.7	180	8.6

0 h 29 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 15.0	7 16.2	6 55.2	0	.0	60	3.0	120	5.9
1	7 15.3	7 16.5	6 55.4	1	.0	61	3.0	121	5.9
2	7 15.5	7 16.7	6 55.7	2	.1	62	3.0	122	6.0
3	7 15.8	7 17.0	6 55.9	3	.1	63	3.1	123	6.0
4	7 16.0	7 17.2	6 56.1	4	.2	64	3.1	124	6.1
5	7 16.3	7 17.5	6 56.4	5	.2	65	3.2	125	6.1
6	7 16.5	7 17.7	6 56.6	6	.3	66	3.2	126	6.2
7	7 16.8	7 18.0	6 56.9	7	.3	67	3.3	127	6.2
8	7 17.0	7 18.2	6 57.1	8	.4	68	3.3	128	6.3
9	7 17.3	7 18.5	6 57.3	9	.4	69	3.4	129	6.3
10	7 17.5	7 18.7	6 57.6	10	.5	70	3.4	130	6.4
11	7 17.8	7 19.0	6 57.8	11	.5	71	3.5	131	6.4
12	7 18.0	7 19.2	6 58.0	12	.6	72	3.5	132	6.5
13	7 18.3	7 19.5	6 58.3	13	.6	73	3.6	133	6.5
14	7 18.5	7 19.7	6 58.5	14	.7	74	3.6	134	6.6
15	7 18.8	7 20.0	6 58.8	15	.7	75	3.7	135	6.6
16	7 19.0	7 20.2	6 59.0	16	.8	76	3.7	136	6.7
17	7 19.3	7 20.5	6 59.2	17	.8	77	3.8	137	6.7
18	7 19.5	7 20.7	6 59.5	18	.9	78	3.8	138	6.8
19	7 19.8	7 21.0	6 59.7	19	.9	79	3.9	139	6.8
20	7 20.0	7 21.2	6 60.0	20	1.0	80	3.9	140	6.9
21	7 20.3	7 21.5	7 .2	21	1.0	81	4.0	141	6.9
22	7 20.5	7 21.7	7 .4	22	1.1	82	4.0	142	7.0
23	7 20.8	7 22.0	7 .7	23	1.1	83	4.1	143	7.0
24	7 21.0	7 22.2	7 .9	24	1.2	84	4.1	144	7.1
25	7 21.3	7 22.5	7 1.1	25	1.2	85	4.2	145	7.1
26	7 21.5	7 22.7	7 1.4	26	1.3	86	4.2	146	7.2
27	7 21.8	7 23.0	7 1.6	27	1.3	87	4.3	147	7.2
28	7 22.0	7 23.2	7 1.9	28	1.4	88	4.3	148	7.3
29	7 22.3	7 23.5	7 2.1	29	1.4	89	4.4	149	7.3
30	7 22.5	7 23.7	7 2.3	30	1.5	90	4.4	150	7.4
31	7 22.8	7 24.0	7 2.6	31	1.5	91	4.5	151	7.4
32	7 23.0	7 24.2	7 2.8	32	1.6	92	4.5	152	7.5
33	7 23.3	7 24.5	7 3.1	33	1.6	93	4.6	153	7.5
34	7 23.5	7 24.7	7 3.3	34	1.7	94	4.6	154	7.6
35	7 23.8	7 25.0	7 3.5	35	1.7	95	4.7	155	7.6
36	7 24.0	7 25.2	7 3.8	36	1.8	96	4.7	156	7.7
37	7 24.3	7 25.5	7 4.0	37	1.8	97	4.8	157	7.7
38	7 24.5	7 25.7	7 4.3	38	1.9	98	4.8	158	7.8
39	7 24.8	7 26.0	7 4.5	39	1.9	99	4.9	159	7.8
40	7 25.0	7 26.2	7 4.7	40	2.0	100	4.9	160	7.9
41	7 25.3	7 26.5	7 5.0	41	2.0	101	5.0	161	7.9
42	7 25.5	7 26.7	7 5.2	42	2.1	102	5.0	162	8.0
43	7 25.8	7 27.0	7 5.4	43	2.1	103	5.1	163	8.0
44	7 26.0	7 27.2	7 5.7	44	2.2	104	5.1	164	8.1
45	7 26.3	7 27.5	7 5.9	45	2.2	105	5.2	165	8.1
46	7 26.5	7 27.7	7 6.2	46	2.3	106	5.2	166	8.2
47	7 26.8	7 28.0	7 6.4	47	2.3	107	5.3	167	8.2
48	7 27.0	7 28.2	7 6.6	48	2.4	108	5.3	168	8.3
49	7 27.3	7 28.5	7 6.9	49	2.4	109	5.4	169	8.3
50	7 27.5	7 28.7	7 7.1	50	2.5	110	5.4	170	8.4
51	7 27.8	7 29.0	7 7.4	51	2.5	111	5.5	171	8.4
52	7 28.0	7 29.2	7 7.6	52	2.6	112	5.5	172	8.5
53	7 28.3	7 29.5	7 7.8	53	2.6	113	5.6	173	8.5
54	7 28.5	7 29.7	7 8.1	54	2.7	114	5.6	174	8.6
55	7 28.8	7 30.0	7 8.3	55	2.7	115	5.7	175	8.6
56	7 29.0	7 30.2	7 8.5	56	2.8	116	5.7	176	8.7
57	7 29.3	7 30.5	7 8.8	57	2.8	117	5.8	177	8.7
58	7 29.5	7 30.7	7 9.0	58	2.9	118	5.8	178	8.8
59	7 29.8	7 31.0	7 9.3	59	2.9	119	5.9	179	8.8
60	7 30.0	7 31.3	7 9.5	60	3.0	120	5.9	180	8.9

0 h 30 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 30.0	7 31.3	7 9.5	0	.0	60	3.1	120	6.1
1	7 30.3	7 31.5	7 9.7	1	.1	61	3.1	121	6.2
2	7 30.5	7 31.8	7 10.0	2	.1	62	3.2	122	6.2
3	7 30.8	7 32.0	7 10.2	3	.2	63	3.2	123	6.3
4	7 31.0	7 32.3	7 10.5	4	.2	64	3.3	124	6.3
5	7 31.3	7 32.5	7 10.7	5	.3	65	3.3	125	6.4
6	7 31.5	7 32.8	7 10.9	6	.3	66	3.4	126	6.4
7	7 31.8	7 33.0	7 11.2	7	.4	67	3.4	127	6.5
8	7 32.0	7 33.3	7 11.4	8	.4	68	3.5	128	6.5
9	7 32.3	7 33.5	7 11.6	9	.5	69	3.5	129	6.6
10	7 32.5	7 33.8	7 11.9	10	.5	70	3.6	130	6.6
11	7 32.8	7 34.0	7 12.1	11	.6	71	3.6	131	6.7
12	7 33.0	7 34.3	7 12.4	12	.6	72	3.7	132	6.7
13	7 33.3	7 34.5	7 12.6	13	.7	73	3.7	133	6.8
14	7 33.5	7 34.8	7 12.8	14	.7	74	3.8	134	6.8
15	7 33.8	7 35.0	7 13.1	15	.8	75	3.8	135	6.9
16	7 34.0	7 35.3	7 13.3	16	.8	76	3.9	136	6.9
17	7 34.3	7 35.5	7 13.6	17	.9	77	3.9	137	7.0
18	7 34.5	7 35.8	7 13.8	18	.9	78	4.0	138	7.0
19	7 34.8	7 36.0	7 14.0	19	1.0	79	4.0	139	7.1
20	7 35.0	7 36.3	7 14.3	20	1.0	80	4.1	140	7.1
21	7 35.3	7 36.5	7 14.5	21	1.1	81	4.1	141	7.2
22	7 35.5	7 36.8	7 14.7	22	1.1	82	4.2	142	7.2
23	7 35.8	7 37.0	7 15.0	23	1.2	83	4.2	143	7.3
24	7 36.0	7 37.3	7 15.2	24	1.2	84	4.3	144	7.3
25	7 36.3	7 37.5	7 15.5	25	1.3	85	4.3	145	7.4
26	7 36.5	7 37.8	7 15.7	26	1.3	86	4.4	146	7.4
27	7 36.8	7 38.0	7 15.9	27	1.4	87	4.4	147	7.5
28	7 37.0	7 38.3	7 16.2	28	1.4	88	4.5	148	7.5
29	7 37.3	7 38.5	7 16.4	29	1.5	89	4.5	149	7.6
30	7 37.5	7 38.8	7 16.7	30	1.5	90	4.6	150	7.6
31	7 37.8	7 39.0	7 16.9	31	1.6	91	4.6	151	7.7
32	7 38.0	7 39.3	7 17.1	32	1.6	92	4.7	152	7.7
33	7 38.3	7 39.5	7 17.4	33	1.7	93	4.7	153	7.8
34	7 38.5	7 39.8	7 17.6	34	1.7	94	4.8	154	7.8
35	7 38.8	7 40.0	7 17.9	35	1.8	95	4.8	155	7.9
36	7 39.0	7 40.3	7 18.1	36	1.8	96	4.9	156	7.9
37	7 39.3	7 40.5	7 18.3	37	1.9	97	4.9	157	8.0
38	7 39.5	7 40.8	7 18.6	38	1.9	98	5.0	158	8.0
39	7 39.8	7 41.0	7 18.8	39	2.0	99	5.0	159	8.1
40	7 40.0	7 41.3	7 19.0	40	2.0	100	5.1	160	8.1
41	7 40.3	7 41.5	7 19.3	41	2.1	101	5.1	161	8.2
42	7 40.5	7 41.8	7 19.5	42	2.1	102	5.2	162	8.2
43	7 40.8	7 42.0	7 19.8	43	2.2	103	5.2	163	8.3
44	7 41.0	7 42.3	7 20.0	44	2.2	104	5.3	164	8.3
45	7 41.3	7 42.5	7 20.2	45	2.3	105	5.3	165	8.4
46	7 41.5	7 42.8	7 20.5	46	2.3	106	5.4	166	8.4
47	7 41.8	7 43.0	7 20.7	47	2.4	107	5.4	167	8.5
48	7 42.0	7 43.3	7 21.0	48	2.4	108	5.5	168	8.5
49	7 42.3	7 43.5	7 21.2	49	2.5	109	5.5	169	8.6
50	7 42.5	7 43.8	7 21.4	50	2.5	110	5.6	170	8.6
51	7 42.8	7 44.0	7 21.7	51	2.6	111	5.6	171	8.7
52	7 43.0	7 44.3	7 21.9	52	2.6	112	5.7	172	8.7
53	7 43.3	7 44.5	7 22.1	53	2.7	113	5.7	173	8.8
54	7 43.5	7 44.8	7 22.4	54	2.7	114	5.8	174	8.8
55	7 43.8	7 45.0	7 22.6	55	2.8	115	5.8	175	8.9
56	7 44.0	7 45.3	7 22.9	56	2.8	116	5.9	176	8.9
57	7 44.3	7 45.5	7 23.1	57	2.9	117	5.9	177	9.0
58	7 44.5	7 45.8	7 23.3	58	2.9	118	6.0	178	9.0
59	7 44.8	7 46.0	7 23.6	59	3.0	119	6.0	179	9.1
60	7 45.0	7 46.3	7 23.8	60	3.1	120	6.1	180	9.2

0 h 31 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	7 45.0	7 46.3	7 23.8	0	.0	60	3.2	120	6.3
1	7 45.3	7 46.5	7 24.1	1	.1	61	3.2	121	6.4
2	7 45.5	7 46.8	7 24.3	2	.1	62	3.3	122	6.4
3	7 45.8	7 47.0	7 24.5	3	.2	63	3.3	123	6.5
4	7 46.0	7 47.3	7 24.8	4	.2	64	3.4	124	6.5
5	7 46.3	7 47.5	7 25.0	5	.3	65	3.4	125	6.6
6	7 46.5	7 47.8	7 25.2	6	.3	66	3.5	126	6.6
7	7 46.8	7 48.0	7 25.5	7	.4	67	3.5	127	6.7
8	7 47.0	7 48.3	7 25.7	8	.4	68	3.6	128	6.7
9	7 47.3	7 48.5	7 26.0	9	.5	69	3.6	129	6.8
10	7 47.5	7 48.8	7 26.2	10	.5	70	3.7	130	6.8
11	7 47.8	7 49.0	7 26.4	11	.6	71	3.7	131	6.9
12	7 48.0	7 49.3	7 26.7	12	.6	72	3.8	132	6.9
13	7 48.3	7 49.6	7 26.9	13	.7	73	3.8	133	7.0
14	7 48.5	7 49.8	7 27.2	14	.7	74	3.9	134	7.0
15	7 48.8	7 50.1	7 27.4	15	.8	75	3.9	135	7.1
16	7 49.0	7 50.3	7 27.6	16	.8	76	4.0	136	7.1
17	7 49.3	7 50.6	7 27.9	17	.9	77	4.0	137	7.2
18	7 49.5	7 50.8	7 28.1	18	.9	78	4.1	138	7.2
19	7 49.8	7 51.1	7 28.4	19	1.0	79	4.1	139	7.3
20	7 50.0	7 51.3	7 28.6	20	1.1	80	4.2	140	7.4
21	7 50.3	7 51.6	7 28.8	21	1.1	81	4.3	141	7.4
22	7 50.5	7 51.8	7 29.1	22	1.2	82	4.3	142	7.5
23	7 50.8	7 52.1	7 29.3	23	1.2	83	4.4	143	7.5
24	7 51.0	7 52.3	7 29.5	24	1.3	84	4.4	144	7.6
25	7 51.3	7 52.6	7 29.8	25	1.3	85	4.5	145	7.6
26	7 51.5	7 52.8	7 30.0	26	1.4	86	4.5	146	7.7
27	7 51.8	7 53.1	7 30.3	27	1.4	87	4.6	147	7.7
28	7 52.0	7 53.3	7 30.5	28	1.5	88	4.6	148	7.8
29	7 52.3	7 53.6	7 30.7	29	1.5	89	4.7	149	7.8
30	7 52.5	7 53.8	7 31.0	30	1.6	90	4.7	150	7.9
31	7 52.8	7 54.1	7 31.2	31	1.6	91	4.8	151	7.9
32	7 53.0	7 54.3	7 31.5	32	1.7	92	4.8	152	8.0
33	7 53.3	7 54.6	7 31.7	33	1.7	93	4.9	153	8.0
34	7 53.5	7 54.8	7 31.9	34	1.8	94	4.9	154	8.1
35	7 53.8	7 55.1	7 32.2	35	1.8	95	5.0	155	8.1
36	7 54.0	7 55.3	7 32.4	36	1.9	96	5.0	156	8.2
37	7 54.3	7 55.6	7 32.6	37	1.9	97	5.1	157	8.2
38	7 54.5	7 55.8	7 32.9	38	2.0	98	5.1	158	8.3
39	7 54.8	7 56.1	7 33.1	39	2.0	99	5.2	159	8.3
40	7 55.0	7 56.3	7 33.4	40	2.1	100	5.3	160	8.4
41	7 55.3	7 56.6	7 33.6	41	2.2	101	5.3	161	8.5
42	7 55.5	7 56.8	7 33.8	42	2.2	102	5.4	162	8.5
43	7 55.8	7 57.1	7 34.1	43	2.3	103	5.4	163	8.6
44	7 56.0	7 57.3	7 34.3	44	2.3	104	5.5	164	8.6
45	7 56.3	7 57.6	7 34.6	45	2.4	105	5.5	165	8.7
46	7 56.5	7 57.8	7 34.8	46	2.4	106	5.6	166	8.7
47	7 56.8	7 58.1	7 35.0	47	2.5	107	5.6	167	8.8
48	7 57.0	7 58.3	7 35.3	48	2.5	108	5.7	168	8.8
49	7 57.3	7 58.6	7 35.5	49	2.6	109	5.7	169	8.9
50	7 57.5	7 58.8	7 35.7	50	2.6	110	5.8	170	8.9
51	7 57.8	7 59.1	7 36.0	51	2.7	111	5.8	171	9.0
52	7 58.0	7 59.3	7 36.2	52	2.7	112	5.9	172	9.0
53	7 58.3	7 59.6	7 36.5	53	2.8	113	5.9	173	9.1
54	7 58.5	7 59.8	7 36.7	54	2.8	114	6.0	174	9.1
55	7 58.8	8 .1	7 36.9	55	2.9	115	6.0	175	9.2
56	7 59.0	8 .3	7 37.2	56	2.9	116	6.1	176	9.2
57	7 59.3	8 .6	7 37.4	57	3.0	117	6.1	177	9.3
58	7 59.5	8 .8	7 37.7	58	3.0	118	6.2	178	9.3
59	7 59.8	8 1.1	7 37.9	59	3.1	119	6.2	179	9.4
60	8 .0	8 1.3	7 38.1	60	3.2	120	6.3	180	9.5

0 h 32 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 .0	8 1.3	7 38.1	0	.0	60	3.3	120	6.5
1	8 .3	8 1.6	7 38.4	1	.1	61	3.3	121	6.6
2	8 .5	8 1.8	7 38.6	2	.1	62	3.4	122	6.6
3	8 .8	8 2.1	7 38.8	3	.2	63	3.4	123	6.7
4	8 1.0	8 2.3	7 39.1	4	.2	64	3.5	124	6.7
5	8 1.3	8 2.6	7 39.3	5	.3	65	3.5	125	6.8
6	8 1.5	8 2.8	7 39.6	6	.3	66	3.6	126	6.8
7	8 1.8	8 3.1	7 39.8	7	.4	67	3.6	127	6.9
8	8 2.0	8 3.3	7 40.0	8	.4	68	3.7	128	6.9
9	8 2.3	8 3.6	7 40.3	9	.5	69	3.7	129	7.0
10	8 2.5	8 3.8	7 40.5	10	.5	70	3.8	130	7.0
11	8 2.8	8 4.1	7 40.8	11	.6	71	3.8	131	7.1
12	8 3.0	8 4.3	7 41.0	12	.7	72	3.9	132	7.2
13	8 3.3	8 4.6	7 41.2	13	.7	73	4.0	133	7.2
14	8 3.5	8 4.8	7 41.5	14	.8	74	4.0	134	7.3
15	8 3.8	8 5.1	7 41.7	15	.8	75	4.1	135	7.3
16	8 4.0	8 5.3	7 42.0	16	.9	76	4.1	136	7.4
17	8 4.3	8 5.6	7 42.2	17	.9	77	4.2	137	7.4
18	8 4.5	8 5.8	7 42.4	18	1.0	78	4.2	138	7.5
19	8 4.8	8 6.1	7 42.7	19	1.0	79	4.3	139	7.5
20	8 5.0	8 6.3	7 42.9	20	1.1	80	4.3	140	7.6
21	8 5.3	8 6.6	7 43.1	21	1.1	81	4.4	141	7.6
22	8 5.5	8 6.8	7 43.4	22	1.2	82	4.4	142	7.7
23	8 5.8	8 7.1	7 43.6	23	1.2	83	4.5	143	7.7
24	8 6.0	8 7.4	7 43.9	24	1.3	84	4.6	144	7.8
25	8 6.3	8 7.6	7 44.1	25	1.4	85	4.6	145	7.9
26	8 6.5	8 7.9	7 44.3	26	1.4	86	4.7	146	7.9
27	8 6.8	8 8.1	7 44.6	27	1.5	87	4.7	147	8.0
28	8 7.0	8 8.4	7 44.8	28	1.5	88	4.8	148	8.0
29	8 7.3	8 8.6	7 45.1	29	1.6	89	4.8	149	8.1
30	8 7.5	8 8.9	7 45.3	30	1.6	90	4.9	150	8.1
31	8 7.8	8 9.1	7 45.5	31	1.7	91	4.9	151	8.2
32	8 8.0	8 9.4	7 45.8	32	1.7	92	5.0	152	8.2
33	8 8.3	8 9.6	7 46.0	33	1.8	93	5.0	153	8.3
34	8 8.5	8 9.9	7 46.2	34	1.8	94	5.1	154	8.3
35	8 8.8	8 10.1	7 46.5	35	1.9	95	5.1	155	8.4
36	8 9.0	8 10.4	7 46.7	36	2.0	96	5.2	156	8.5
37	8 9.3	8 10.6	7 47.0	37	2.0	97	5.3	157	8.5
38	8 9.5	8 10.9	7 47.2	38	2.1	98	5.3	158	8.6
39	8 9.8	8 11.1	7 47.4	39	2.1	99	5.4	159	8.6
40	8 10.0	8 11.4	7 47.7	40	2.2	100	5.4	160	8.7
41	8 10.3	8 11.6	7 47.9	41	2.2	101	5.5	161	8.7
42	8 10.5	8 11.9	7 48.2	42	2.3	102	5.5	162	8.8
43	8 10.8	8 12.1	7 48.4	43	2.3	103	5.6	163	8.8
44	8 11.0	8 12.4	7 48.6	44	2.4	104	5.6	164	8.9
45	8 11.3	8 12.6	7 48.9	45	2.4	105	5.7	165	8.9
46	8 11.5	8 12.9	7 49.1	46	2.5	106	5.7	166	9.0
47	8 11.8	8 13.1	7 49.3	47	2.5	107	5.8	167	9.0
48	8 12.0	8 13.4	7 49.6	48	2.6	108	5.9	168	9.1
49	8 12.3	8 13.6	7 49.8	49	2.7	109	5.9	169	9.2
50	8 12.5	8 13.9	7 50.1	50	2.7	110	6.0	170	9.2
51	8 12.8	8 14.1	7 50.3	51	2.8	111	6.0	171	9.3
52	8 13.0	8 14.4	7 50.5	52	2.8	112	6.1	172	9.3
53	8 13.3	8 14.6	7 50.8	53	2.9	113	6.1	173	9.4
54	8 13.5	8 14.9	7 51.0	54	2.9	114	6.2	174	9.4
55	8 13.8	8 15.1	7 51.3	55	3.0	115	6.2	175	9.5
56	8 14.0	8 15.4	7 51.5	56	3.0	116	6.3	176	9.5
57	8 14.3	8 15.6	7 51.7	57	3.1	117	6.3	177	9.6
58	8 14.5	8 15.9	7 52.0	58	3.1	118	6.4	178	9.6
59	8 14.8	8 16.1	7 52.2	59	3.2	119	6.4	179	9.7
60	8 15.0	8 16.4	7 52.5	60	3.3	120	6.5	180	9.8

0 h 33 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 15.0	8 16.4	7 52.5	0	.0	60	3.4	120	6.7
1	8 15.3	8 16.6	7 52.7	1	.1	61	3.4	121	6.8
2	8 15.5	8 16.9	7 52.9	2	.1	62	3.5	122	6.8
3	8 15.8	8 17.1	7 53.2	3	.2	63	3.5	123	6.9
4	8 16.0	8 17.4	7 53.4	4	.2	64	3.6	124	6.9
5	8 16.3	8 17.6	7 53.6	5	.3	65	3.6	125	7.0
6	8 16.5	8 17.9	7 53.9	6	.3	66	3.7	126	7.0
7	8 16.8	8 18.1	7 54.1	7	.4	67	3.7	127	7.1
8	8 17.0	8 18.4	7 54.4	8	.4	68	3.8	128	7.1
9	8 17.3	8 18.6	7 54.6	9	.5	69	3.9	129	7.2
10	8 17.5	8 18.9	7 54.8	10	.6	70	3.9	130	7.3
11	8 17.8	8 19.1	7 55.1	11	.6	71	4.0	131	7.3
12	8 18.0	8 19.4	7 55.3	12	.7	72	4.0	132	7.4
13	8 18.3	8 19.6	7 55.6	13	.7	73	4.1	133	7.4
14	8 18.5	8 19.9	7 55.8	14	.8	74	4.1	134	7.5
15	8 18.8	8 20.1	7 56.0	15	.8	75	4.2	135	7.5
16	8 19.0	8 20.4	7 56.3	16	.9	76	4.2	136	7.6
17	8 19.3	8 20.6	7 56.5	17	.9	77	4.3	137	7.6
18	8 19.5	8 20.9	7 56.7	18	1.0	78	4.4	138	7.7
19	8 19.8	8 21.1	7 57.0	19	1.1	79	4.4	139	7.8
20	8 20.0	8 21.4	7 57.2	20	1.1	80	4.5	140	7.8
21	8 20.3	8 21.6	7 57.5	21	1.2	81	4.5	141	7.9
22	8 20.5	8 21.9	7 57.7	22	1.2	82	4.6	142	7.9
23	8 20.8	8 22.1	7 57.9	23	1.3	83	4.6	143	8.0
24	8 21.0	8 22.4	7 58.2	24	1.3	84	4.7	144	8.0
25	8 21.3	8 22.6	7 58.4	25	1.4	85	4.7	145	8.1
26	8 21.5	8 22.9	7 58.7	26	1.5	86	4.8	146	8.2
27	8 21.8	8 23.1	7 58.9	27	1.5	87	4.9	147	8.2
28	8 22.0	8 23.4	7 59.1	28	1.6	88	4.9	148	8.3
29	8 22.3	8 23.6	7 59.4	29	1.6	89	5.0	149	8.3
30	8 22.5	8 23.9	7 59.6	30	1.7	90	5.0	150	8.4
31	8 22.8	8 24.1	7 59.8	31	1.7	91	5.1	151	8.4
32	8 23.0	8 24.4	8 .1	32	1.8	92	5.1	152	8.5
33	8 23.3	8 24.6	8 .3	33	1.8	93	5.2	153	8.5
34	8 23.5	8 24.9	8 .6	34	1.9	94	5.2	154	8.6
35	8 23.8	8 25.1	8 .8	35	2.0	95	5.3	155	8.7
36	8 24.0	8 25.4	8 1.0	36	2.0	96	5.4	156	8.7
37	8 24.3	8 25.7	8 1.3	37	2.1	97	5.4	157	8.8
38	8 24.5	8 25.9	8 1.5	38	2.1	98	5.5	158	8.8
39	8 24.8	8 26.2	8 1.8	39	2.2	99	5.5	159	8.9
40	8 25.0	8 26.4	8 2.0	40	2.2	100	5.6	160	8.9
41	8 25.3	8 26.7	8 2.2	41	2.3	101	5.6	161	9.0
42	8 25.5	8 26.9	8 2.5	42	2.3	102	5.7	162	9.0
43	8 25.8	8 27.2	8 2.7	43	2.4	103	5.8	163	9.1
44	8 26.0	8 27.4	8 2.9	44	2.5	104	5.8	164	9.2
45	8 26.3	8 27.7	8 3.2	45	2.5	105	5.9	165	9.2
46	8 26.5	8 27.9	8 3.4	46	2.6	106	5.9	166	9.3
47	8 26.8	8 28.2	8 3.7	47	2.6	107	6.0	167	9.3
48	8 27.0	8 28.4	8 3.9	48	2.7	108	6.0	168	9.4
49	8 27.3	8 28.7	8 4.1	49	2.7	109	6.1	169	9.4
50	8 27.5	8 28.9	8 4.4	50	2.8	110	6.1	170	9.5
51	8 27.8	8 29.2	8 4.6	51	2.8	111	6.2	171	9.5
52	8 28.0	8 29.4	8 4.9	52	2.9	112	6.3	172	9.6
53	8 28.3	8 29.7	8 5.1	53	3.0	113	6.3	173	9.7
54	8 28.5	8 29.9	8 5.3	54	3.0	114	6.4	174	9.7
55	8 28.8	8 30.2	8 5.6	55	3.1	115	6.4	175	9.8
56	8 29.0	8 30.4	8 5.8	56	3.1	116	6.5	176	9.8
57	8 29.3	8 30.7	8 6.1	57	3.2	117	6.5	177	9.9
58	8 29.5	8 30.9	8 6.3	58	3.2	118	6.6	178	9.9
59	8 29.8	8 31.2	8 6.5	59	3.3	119	6.6	179	10.0
60	8 30.0	8 31.4	8 6.8	60	3.4	120	6.7	180	10.1

0 h 34 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 30.0	8 31.4	8 6.8	0	.0	60	3.5	120	6.9
1	8 30.3	8 31.7	8 7.0	1	.1	61	3.5	121	7.0
2	8 30.5	8 31.9	8 7.2	2	.1	62	3.6	122	7.0
3	8 30.8	8 32.2	8 7.5	3	.2	63	3.6	123	7.1
4	8 31.0	8 32.4	8 7.7	4	.2	64	3.7	124	7.1
5	8 31.3	8 32.7	8 8.0	5	.3	65	3.7	125	7.2
6	8 31.5	8 32.9	8 8.2	6	.3	66	3.8	126	7.2
7	8 31.8	8 33.2	8 8.4	7	.4	67	3.9	127	7.3
8	8 32.0	8 33.4	8 8.7	8	.5	68	3.9	128	7.4
9	8 32.3	8 33.7	8 8.9	9	.5	69	4.0	129	7.4
10	8 32.5	8 33.9	8 9.2	10	.6	70	4.0	130	7.5
11	8 32.8	8 34.2	8 9.4	11	.6	71	4.1	131	7.5
12	8 33.0	8 34.4	8 9.6	12	.7	72	4.1	132	7.6
13	8 33.3	8 34.7	8 9.9	13	.7	73	4.2	133	7.6
14	8 33.5	8 34.9	8 10.1	14	.8	74	4.3	134	7.7
15	8 33.8	8 35.2	8 10.3	15	.9	75	4.3	135	7.8
16	8 34.0	8 35.4	8 10.6	16	.9	76	4.4	136	7.8
17	8 34.3	8 35.7	8 10.8	17	1.0	77	4.4	137	7.9
18	8 34.5	8 35.9	8 11.1	18	1.0	78	4.5	138	7.9
19	8 34.8	8 36.2	8 11.3	19	1.1	79	4.5	139	8.0
20	8 35.0	8 36.4	8 11.5	20	1.2	80	4.6	140	8.1
21	8 35.3	8 36.7	8 11.8	21	1.2	81	4.7	141	8.1
22	8 35.5	8 36.9	8 12.0	22	1.3	82	4.7	142	8.2
23	8 35.8	8 37.2	8 12.3	23	1.3	83	4.8	143	8.2
24	8 36.0	8 37.4	8 12.5	24	1.4	84	4.8	144	8.3
25	8 36.3	8 37.7	8 12.7	25	1.4	85	4.9	145	8.3
26	8 36.5	8 37.9	8 13.0	26	1.5	86	4.9	146	8.4
27	8 36.8	8 38.2	8 13.2	27	1.6	87	5.0	147	8.5
28	8 37.0	8 38.4	8 13.4	28	1.6	88	5.1	148	8.5
29	8 37.3	8 38.7	8 13.7	29	1.7	89	5.1	149	8.6
30	8 37.5	8 38.9	8 13.9	30	1.7	90	5.2	150	8.6
31	8 37.8	8 39.2	8 14.2	31	1.8	91	5.2	151	8.7
32	8 38.0	8 39.4	8 14.4	32	1.8	92	5.3	152	8.7
33	8 38.3	8 39.7	8 14.6	33	1.9	93	5.3	153	8.8
34	8 38.5	8 39.9	8 14.9	34	2.0	94	5.4	154	8.9
35	8 38.8	8 40.2	8 15.1	35	2.0	95	5.5	155	8.9
36	8 39.0	8 40.4	8 15.4	36	2.1	96	5.5	156	9.0
37	8 39.3	8 40.7	8 15.6	37	2.1	97	5.6	157	9.0
38	8 39.5	8 40.9	8 15.8	38	2.2	98	5.6	158	9.1
39	8 39.8	8 41.2	8 16.1	39	2.2	99	5.7	159	9.1
40	8 40.0	8 41.4	8 16.3	40	2.3	100	5.8	160	9.2
41	8 40.3	8 41.7	8 16.5	41	2.4	101	5.8	161	9.3
42	8 40.5	8 41.9	8 16.8	42	2.4	102	5.9	162	9.3
43	8 40.8	8 42.2	8 17.0	43	2.5	103	5.9	163	9.4
44	8 41.0	8 42.4	8 17.3	44	2.5	104	6.0	164	9.4
45	8 41.3	8 42.7	8 17.5	45	2.6	105	6.0	165	9.5
46	8 41.5	8 42.9	8 17.7	46	2.6	106	6.1	166	9.5
47	8 41.8	8 43.2	8 18.0	47	2.7	107	6.2	167	9.6
48	8 42.0	8 43.5	8 18.2	48	2.8	108	6.2	168	9.7
49	8 42.3	8 43.7	8 18.5	49	2.8	109	6.3	169	9.7
50	8 42.5	8 44.0	8 18.7	50	2.9	110	6.3	170	9.8
51	8 42.8	8 44.2	8 18.9	51	2.9	111	6.4	171	9.8
52	8 43.0	8 44.5	8 19.2	52	3.0	112	6.4	172	9.9
53	8 43.3	8 44.7	8 19.4	53	3.0	113	6.5	173	9.9
54	8 43.5	8 45.0	8 19.7	54	3.1	114	6.6	174	10.0
55	8 43.8	8 45.2	8 19.9	55	3.2	115	6.6	175	10.1
56	8 44.0	8 45.5	8 20.1	56	3.2	116	6.7	176	10.1
57	8 44.3	8 45.7	8 20.4	57	3.3	117	6.7	177	10.2
58	8 44.5	8 46.0	8 20.6	58	3.3	118	6.8	178	10.2
59	8 44.8	8 46.2	8 20.8	59	3.4	119	6.8	179	10.3
60	8 45.0	8 46.5	8 21.1	60	3.5	120	6.9	180	10.4

0 h 35 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	8 45.0	8 46.5	8 21.1	0	.0	60	3.6	120	7.1
1	8 45.3	8 46.7	8 21.3	1	.1	61	3.6	121	7.2
2	8 45.5	8 47.0	8 21.6	2	.1	62	3.7	122	7.2
3	8 45.8	8 47.2	8 21.8	3	.2	63	3.7	123	7.3
4	8 46.0	8 47.5	8 22.0	4	.2	64	3.8	124	7.3
5	8 46.3	8 47.7	8 22.3	5	.3	65	3.8	125	7.4
6	8 46.5	8 48.0	8 22.5	6	.4	66	3.9	126	7.5
7	8 46.8	8 48.2	8 22.8	7	.4	67	4.0	127	7.5
8	8 47.0	8 48.5	8 23.0	8	.5	68	4.0	128	7.6
9	8 47.3	8 48.7	8 23.2	9	.5	69	4.1	129	7.6
10	8 47.5	8 49.0	8 23.5	10	.6	70	4.1	130	7.7
11	8 47.8	8 49.2	8 23.7	11	.7	71	4.2	131	7.8
12	8 48.0	8 49.5	8 23.9	12	.7	72	4.3	132	7.8
13	8 48.3	8 49.7	8 24.2	13	.8	73	4.3	133	7.9
14	8 48.5	8 50.0	8 24.4	14	.8	74	4.4	134	7.9
15	8 48.8	8 50.2	8 24.7	15	.9	75	4.4	135	8.0
16	8 49.0	8 50.5	8 24.9	16	.9	76	4.5	136	8.0
17	8 49.3	8 50.7	8 25.1	17	1.0	77	4.6	137	8.1
18	8 49.5	8 51.0	8 25.4	18	1.1	78	4.6	138	8.2
19	8 49.8	8 51.2	8 25.6	19	1.1	79	4.7	139	8.2
20	8 50.0	8 51.5	8 25.9	20	1.2	80	4.7	140	8.3
21	8 50.3	8 51.7	8 26.1	21	1.2	81	4.8	141	8.3
22	8 50.5	8 52.0	8 26.3	22	1.3	82	4.9	142	8.4
23	8 50.8	8 52.2	8 26.6	23	1.4	83	4.9	143	8.5
24	8 51.0	8 52.5	8 26.8	24	1.4	84	5.0	144	8.5
25	8 51.3	8 52.7	8 27.0	25	1.5	85	5.0	145	8.6
26	8 51.5	8 53.0	8 27.3	26	1.5	86	5.1	146	8.6
27	8 51.8	8 53.2	8 27.5	27	1.6	87	5.1	147	8.7
28	8 52.0	8 53.5	8 27.8	28	1.7	88	5.2	148	8.8
29	8 52.3	8 53.7	8 28.0	29	1.7	89	5.3	149	8.8
30	8 52.5	8 54.0	8 28.2	30	1.8	90	5.3	150	8.9
31	8 52.8	8 54.2	8 28.5	31	1.8	91	5.4	151	8.9
32	8 53.0	8 54.5	8 28.7	32	1.9	92	5.4	152	9.0
33	8 53.3	8 54.7	8 29.0	33	2.0	93	5.5	153	9.1
34	8 53.5	8 55.0	8 29.2	34	2.0	94	5.6	154	9.1
35	8 53.8	8 55.2	8 29.4	35	2.1	95	5.6	155	9.2
36	8 54.0	8 55.5	8 29.7	36	2.1	96	5.7	156	9.2
37	8 54.3	8 55.7	8 29.9	37	2.2	97	5.7	157	9.3
38	8 54.5	8 56.0	8 30.2	38	2.2	98	5.8	158	9.3
39	8 54.8	8 56.2	8 30.4	39	2.3	99	5.9	159	9.4
40	8 55.0	8 56.5	8 30.6	40	2.4	100	5.9	160	9.5
41	8 55.3	8 56.7	8 30.9	41	2.4	101	6.0	161	9.5
42	8 55.5	8 57.0	8 31.1	42	2.5	102	6.0	162	9.6
43	8 55.8	8 57.2	8 31.3	43	2.5	103	6.1	163	9.6
44	8 56.0	8 57.5	8 31.6	44	2.6	104	6.2	164	9.7
45	8 56.3	8 57.7	8 31.8	45	2.7	105	6.2	165	9.8
46	8 56.5	8 58.0	8 32.1	46	2.7	106	6.3	166	9.8
47	8 56.8	8 58.2	8 32.3	47	2.8	107	6.3	167	9.9
48	8 57.0	8 58.5	8 32.5	48	2.8	108	6.4	168	9.9
49	8 57.3	8 58.7	8 32.8	49	2.9	109	6.4	169	10.0
50	8 57.5	8 59.0	8 33.0	50	3.0	110	6.5	170	10.1
51	8 57.8	8 59.2	8 33.3	51	3.0	111	6.6	171	10.1
52	8 58.0	8 59.5	8 33.5	52	3.1	112	6.6	172	10.2
53	8 58.3	8 59.7	8 33.7	53	3.1	113	6.7	173	10.2
54	8 58.5	8 60.0	8 34.0	54	3.2	114	6.7	174	10.3
55	8 58.8	9 .2	8 34.2	55	3.3	115	6.8	175	10.4
56	8 59.0	9 .5	8 34.4	56	3.3	116	6.9	176	10.4
57	8 59.3	9 .7	8 34.7	57	3.4	117	6.9	177	10.5
58	8 59.5	9 1.0	8 34.9	58	3.4	118	7.0	178	10.5
59	8 59.8	9 1.2	8 35.2	59	3.5	119	7.0	179	10.6
60	9 .0	9 1.5	8 35.4	60	3.6	120	7.1	180	10.7

0 h 36 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 .0	9 1.5	8 35.4	0	.0	60	3.7	120	7.3
1	9 .3	9 1.8	8 35.6	1	.1	61	3.7	121	7.4
2	9 .5	9 2.0	8 35.9	2	.1	62	3.8	122	7.4
3	9 .8	9 2.3	8 36.1	3	.2	63	3.8	123	7.5
4	9 1.0	9 2.5	8 36.4	4	.2	64	3.9	124	7.5
5	9 1.3	9 2.8	8 36.6	5	.3	65	4.0	125	7.6
6	9 1.5	9 3.0	8 36.8	6	.4	66	4.0	126	7.7
7	9 1.8	9 3.3	8 37.1	7	.4	67	4.1	127	7.7
8	9 2.0	9 3.5	8 37.3	8	.5	68	4.1	128	7.8
9	9 2.3	9 3.8	8 37.5	9	.5	69	4.2	129	7.8
10	9 2.5	9 4.0	8 37.8	10	.6	70	4.3	130	7.9
11	9 2.8	9 4.3	8 38.0	11	.7	71	4.3	131	8.0
12	9 3.0	9 4.5	8 38.3	12	.7	72	4.4	132	8.0
13	9 3.3	9 4.8	8 38.5	13	.8	73	4.4	133	8.1
14	9 3.5	9 5.0	8 38.7	14	.9	74	4.5	134	8.2
15	9 3.8	9 5.3	8 39.0	15	.9	75	4.6	135	8.2
16	9 4.0	9 5.5	8 39.2	16	1.0	76	4.6	136	8.3
17	9 4.3	9 5.8	8 39.5	17	1.0	77	4.7	137	8.3
18	9 4.5	9 6.0	8 39.7	18	1.1	78	4.7	138	8.4
19	9 4.8	9 6.3	8 39.9	19	1.2	79	4.8	139	8.5
20	9 5.0	9 6.5	8 40.2	20	1.2	80	4.9	140	8.5
21	9 5.3	9 6.8	8 40.4	21	1.3	81	4.9	141	8.6
22	9 5.5	9 7.0	8 40.6	22	1.3	82	5.0	142	8.6
23	9 5.8	9 7.3	8 40.9	23	1.4	83	5.0	143	8.7
24	9 6.0	9 7.5	8 41.1	24	1.5	84	5.1	144	8.8
25	9 6.3	9 7.8	8 41.4	25	1.5	85	5.2	145	8.8
26	9 6.5	9 8.0	8 41.6	26	1.6	86	5.2	146	8.9
27	9 6.8	9 8.3	8 41.8	27	1.6	87	5.3	147	8.9
28	9 7.0	9 8.5	8 42.1	28	1.7	88	5.4	148	9.0
29	9 7.3	9 8.8	8 42.3	29	1.8	89	5.4	149	9.1
30	9 7.5	9 9.0	8 42.6	30	1.8	90	5.5	150	9.1
31	9 7.8	9 9.3	8 42.8	31	1.9	91	5.5	151	9.2
32	9 8.0	9 9.5	8 43.0	32	1.9	92	5.6	152	9.2
33	9 8.3	9 9.8	8 43.3	33	2.0	93	5.7	153	9.3
34	9 8.5	9 10.0	8 43.5	34	2.1	94	5.7	154	9.4
35	9 8.8	9 10.3	8 43.8	35	2.1	95	5.8	155	9.4
36	9 9.0	9 10.5	8 44.0	36	2.2	96	5.8	156	9.5
37	9 9.3	9 10.8	8 44.2	37	2.3	97	5.9	157	9.6
38	9 9.5	9 11.0	8 44.5	38	2.3	98	6.0	158	9.6
39	9 9.8	9 11.3	8 44.7	39	2.4	99	6.0	159	9.7
40	9 10.0	9 11.5	8 44.9	40	2.4	100	6.1	160	9.7
41	9 10.3	9 11.8	8 45.2	41	2.5	101	6.1	161	9.8
42	9 10.5	9 12.0	8 45.4	42	2.6	102	6.2	162	9.9
43	9 10.8	9 12.3	8 45.7	43	2.6	103	6.3	163	9.9
44	9 11.0	9 12.5	8 45.9	44	2.7	104	6.3	164	10.0
45	9 11.3	9 12.8	8 46.1	45	2.7	105	6.4	165	10.0
46	9 11.5	9 13.0	8 46.4	46	2.8	106	6.4	166	10.1
47	9 11.8	9 13.3	8 46.6	47	2.9	107	6.5	167	10.2
48	9 12.0	9 13.5	8 46.9	48	2.9	108	6.6	168	10.2
49	9 12.3	9 13.8	8 47.1	49	3.0	109	6.6	169	10.3
50	9 12.5	9 14.0	8 47.3	50	3.0	110	6.7	170	10.3
51	9 12.8	9 14.3	8 47.6	51	3.1	111	6.8	171	10.4
52	9 13.0	9 14.5	8 47.8	52	3.2	112	6.8	172	10.5
53	9 13.3	9 14.8	8 48.0	53	3.2	113	6.9	173	10.5
54	9 13.5	9 15.0	8 48.3	54	3.3	114	6.9	174	10.6
55	9 13.8	9 15.3	8 48.5	55	3.3	115	7.0	175	10.6
56	9 14.0	9 15.5	8 48.8	56	3.4	116	7.1	176	10.7
57	9 14.3	9 15.8	8 49.0	57	3.5	117	7.1	177	10.8
58	9 14.5	9 16.0	8 49.2	58	3.5	118	7.2	178	10.8
59	9 14.8	9 16.3	8 49.5	59	3.6	119	7.2	179	10.9
60	9 15.0	9 16.5	8 49.7	60	3.7	120	7.3	180	11.0

0 h 37 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 15.0	9 16.5	8 49.7	0	.0	60	3.8	120	7.5
1	9 15.3	9 16.8	8 50.0	1	.1	61	3.8	121	7.6
2	9 15.5	9 17.0	8 50.2	2	.1	62	3.9	122	7.6
3	9 15.8	9 17.3	8 50.4	3	.2	63	3.9	123	7.7
4	9 16.0	9 17.5	8 50.7	4	.3	64	4.0	124	7.8
5	9 16.3	9 17.8	8 50.9	5	.3	65	4.1	125	7.8
6	9 16.5	9 18.0	8 51.1	6	.4	66	4.1	126	7.9
7	9 16.8	9 18.3	8 51.4	7	.4	67	4.2	127	7.9
8	9 17.0	9 18.5	8 51.6	8	.5	68	4.3	128	8.0
9	9 17.3	9 18.8	8 51.9	9	.6	69	4.3	129	8.1
10	9 17.5	9 19.0	8 52.1	10	.6	70	4.4	130	8.1
11	9 17.8	9 19.3	8 52.3	11	.7	71	4.4	131	8.2
12	9 18.0	9 19.6	8 52.6	12	.8	72	4.5	132	8.3
13	9 18.3	9 19.8	8 52.8	13	.8	73	4.6	133	8.3
14	9 18.5	9 20.1	8 53.1	14	.9	74	4.6	134	8.4
15	9 18.8	9 20.3	8 53.3	15	.9	75	4.7	135	8.4
16	9 19.0	9 20.6	8 53.5	16	1.0	76	4.8	136	8.5
17	9 19.3	9 20.8	8 53.8	17	1.1	77	4.8	137	8.6
18	9 19.5	9 21.1	8 54.0	18	1.1	78	4.9	138	8.6
19	9 19.8	9 21.3	8 54.3	19	1.2	79	4.9	139	8.7
20	9 20.0	9 21.6	8 54.5	20	1.3	80	5.0	140	8.8
21	9 20.3	9 21.8	8 54.7	21	1.3	81	5.1	141	8.8
22	9 20.5	9 22.1	8 55.0	22	1.4	82	5.1	142	8.9
23	9 20.8	9 22.3	8 55.2	23	1.4	83	5.2	143	8.9
24	9 21.0	9 22.6	8 55.4	24	1.5	84	5.3	144	9.0
25	9 21.3	9 22.8	8 55.7	25	1.6	85	5.3	145	9.1
26	9 21.5	9 23.1	8 55.9	26	1.6	86	5.4	146	9.1
27	9 21.8	9 23.3	8 56.2	27	1.7	87	5.4	147	9.2
28	9 22.0	9 23.6	8 56.4	28	1.8	88	5.5	148	9.3
29	9 22.3	9 23.8	8 56.6	29	1.8	89	5.6	149	9.3
30	9 22.5	9 24.1	8 56.9	30	1.9	90	5.6	150	9.4
31	9 22.8	9 24.3	8 57.1	31	1.9	91	5.7	151	9.4
32	9 23.0	9 24.6	8 57.4	32	2.0	92	5.8	152	9.5
33	9 23.3	9 24.8	8 57.6	33	2.1	93	5.8	153	9.6
34	9 23.5	9 25.1	8 57.8	34	2.1	94	5.9	154	9.6
35	9 23.8	9 25.3	8 58.1	35	2.2	95	5.9	155	9.7
36	9 24.0	9 25.6	8 58.3	36	2.3	96	6.0	156	9.8
37	9 24.3	9 25.8	8 58.5	37	2.3	97	6.1	157	9.8
38	9 24.5	9 26.1	8 58.8	38	2.4	98	6.1	158	9.9
39	9 24.8	9 26.3	8 59.0	39	2.4	99	6.2	159	9.9
40	9 25.0	9 26.6	8 59.3	40	2.5	100	6.3	160	10.0
41	9 25.3	9 26.8	8 59.5	41	2.6	101	6.3	161	10.1
42	9 25.5	9 27.1	8 59.7	42	2.6	102	6.4	162	10.1
43	9 25.8	9 27.3	8 60.0	43	2.7	103	6.4	163	10.2
44	9 26.0	9 27.6	9 .2	44	2.8	104	6.5	164	10.3
45	9 26.3	9 27.8	9 .5	45	2.8	105	6.6	165	10.3
46	9 26.5	9 28.1	9 .7	46	2.9	106	6.6	166	10.4
47	9 26.8	9 28.3	9 .9	47	2.9	107	6.7	167	10.4
48	9 27.0	9 28.6	9 1.2	48	3.0	108	6.8	168	10.5
49	9 27.3	9 28.8	9 1.4	49	3.1	109	6.8	169	10.6
50	9 27.5	9 29.1	9 1.6	50	3.1	110	6.9	170	10.6
51	9 27.8	9 29.3	9 1.9	51	3.2	111	6.9	171	10.7
52	9 28.0	9 29.6	9 2.1	52	3.3	112	7.0	172	10.8
53	9 28.3	9 29.8	9 2.4	53	3.3	113	7.1	173	10.8
54	9 28.5	9 30.1	9 2.6	54	3.4	114	7.1	174	10.9
55	9 28.8	9 30.3	9 2.8	55	3.4	115	7.2	175	10.9
56	9 29.0	9 30.6	9 3.1	56	3.5	116	7.3	176	11.0
57	9 29.3	9 30.8	9 3.3	57	3.6	117	7.3	177	11.1
58	9 29.5	9 31.1	9 3.6	58	3.6	118	7.4	178	11.1
59	9 29.8	9 31.3	9 3.8	59	3.7	119	7.4	179	11.2
60	9 30.0	9 31.6	9 4.0	60	3.8	120	7.5	180	11.3

0 h 38 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 30.0	9 31.6	9 4.0	0	.0	60	3.9	120	7.7
1	9 30.3	9 31.8	9 4.3	1	.1	61	3.9	121	7.8
2	9 30.5	9 32.1	9 4.5	2	.1	62	4.0	122	7.8
3	9 30.8	9 32.3	9 4.7	3	.2	63	4.0	123	7.9
4	9 31.0	9 32.6	9 5.0	4	.3	64	4.1	124	8.0
5	9 31.3	9 32.8	9 5.2	5	.3	65	4.2	125	8.0
6	9 31.5	9 33.1	9 5.5	6	.4	66	4.2	126	8.1
7	9 31.8	9 33.3	9 5.7	7	.4	67	4.3	127	8.1
8	9 32.0	9 33.6	9 5.9	8	.5	68	4.4	128	8.2
9	9 32.3	9 33.8	9 6.2	9	.6	69	4.4	129	8.3
10	9 32.5	9 34.1	9 6.4	10	.6	70	4.5	130	8.3
11	9 32.8	9 34.3	9 6.7	11	.7	71	4.6	131	8.4
12	9 33.0	9 34.6	9 6.9	12	.8	72	4.6	132	8.5
13	9 33.3	9 34.8	9 7.1	13	.8	73	4.7	133	8.5
14	9 33.5	9 35.1	9 7.4	14	.9	74	4.7	134	8.6
15	9 33.8	9 35.3	9 7.6	15	1.0	75	4.8	135	8.7
16	9 34.0	9 35.6	9 7.9	16	1.0	76	4.9	136	8.7
17	9 34.3	9 35.8	9 8.1	17	1.1	77	4.9	137	8.8
18	9 34.5	9 36.1	9 8.3	18	1.2	78	5.0	138	8.9
19	9 34.8	9 36.3	9 8.6	19	1.2	79	5.1	139	8.9
20	9 35.0	9 36.6	9 8.8	20	1.3	80	5.1	140	9.0
21	9 35.3	9 36.8	9 9.0	21	1.3	81	5.2	141	9.0
22	9 35.5	9 37.1	9 9.3	22	1.4	82	5.3	142	9.1
23	9 35.8	9 37.3	9 9.5	23	1.5	83	5.3	143	9.2
24	9 36.0	9 37.6	9 9.8	24	1.5	84	5.4	144	9.2
25	9 36.3	9 37.9	9 10.0	25	1.6	85	5.5	145	9.3
26	9 36.5	9 38.1	9 10.2	26	1.7	86	5.5	146	9.4
27	9 36.8	9 38.4	9 10.5	27	1.7	87	5.6	147	9.4
28	9 37.0	9 38.6	9 10.7	28	1.8	88	5.6	148	9.5
29	9 37.3	9 38.9	9 11.0	29	1.9	89	5.7	149	9.6
30	9 37.5	9 39.1	9 11.2	30	1.9	90	5.8	150	9.6
31	9 37.8	9 39.4	9 11.4	31	2.0	91	5.8	151	9.7
32	9 38.0	9 39.6	9 11.7	32	2.1	92	5.9	152	9.8
33	9 38.3	9 39.9	9 11.9	33	2.1	93	6.0	153	9.8
34	9 38.5	9 40.1	9 12.1	34	2.2	94	6.0	154	9.9
35	9 38.8	9 40.4	9 12.4	35	2.2	95	6.1	155	9.9
36	9 39.0	9 40.6	9 12.6	36	2.3	96	6.2	156	10.0
37	9 39.3	9 40.9	9 12.9	37	2.4	97	6.2	157	10.1
38	9 39.5	9 41.1	9 13.1	38	2.4	98	6.3	158	10.1
39	9 39.8	9 41.4	9 13.3	39	2.5	99	6.4	159	10.2
40	9 40.0	9 41.6	9 13.6	40	2.6	100	6.4	160	10.3
41	9 40.3	9 41.9	9 13.8	41	2.6	101	6.5	161	10.3
42	9 40.5	9 42.1	9 14.1	42	2.7	102	6.5	162	10.4
43	9 40.8	9 42.4	9 14.3	43	2.8	103	6.6	163	10.5
44	9 41.0	9 42.6	9 14.5	44	2.8	104	6.7	164	10.5
45	9 41.3	9 42.9	9 14.8	45	2.9	105	6.7	165	10.6
46	9 41.5	9 43.1	9 15.0	46	3.0	106	6.8	166	10.7
47	9 41.8	9 43.4	9 15.2	47	3.0	107	6.9	167	10.7
48	9 42.0	9 43.6	9 15.5	48	3.1	108	6.9	168	10.8
49	9 42.3	9 43.9	9 15.7	49	3.1	109	7.0	169	10.8
50	9 42.5	9 44.1	9 16.0	50	3.2	110	7.1	170	10.9
51	9 42.8	9 44.4	9 16.2	51	3.3	111	7.1	171	11.0
52	9 43.0	9 44.6	9 16.4	52	3.3	112	7.2	172	11.0
53	9 43.3	9 44.9	9 16.7	53	3.4	113	7.3	173	11.1
54	9 43.5	9 45.1	9 16.9	54	3.5	114	7.3	174	11.2
55	9 43.8	9 45.4	9 17.2	55	3.5	115	7.4	175	11.2
56	9 44.0	9 45.6	9 17.4	56	3.6	116	7.4	176	11.3
57	9 44.3	9 45.9	9 17.6	57	3.7	117	7.5	177	11.4
58	9 44.5	9 46.1	9 17.9	58	3.7	118	7.6	178	11.4
59	9 44.8	9 46.4	9 18.1	59	3.8	119	7.6	179	11.5
60	9 45.0	9 46.6	9 18.4	60	3.9	120	7.7	180	11.6

0 h 39 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	9 45.0	9 46.6	9 18.4	0	.0	60	4.0	120	7.9
1	9 45.3	9 46.9	9 18.6	1	.1	61	4.0	121	8.0
2	9 45.5	9 47.1	9 18.8	2	.1	62	4.1	122	8.0
3	9 45.8	9 47.4	9 19.1	3	.2	63	4.1	123	8.1
4	9 46.0	9 47.6	9 19.3	4	.3	64	4.2	124	8.2
5	9 46.3	9 47.9	9 19.5	5	.3	65	4.3	125	8.2
6	9 46.5	9 48.1	9 19.8	6	.4	66	4.3	126	8.3
7	9 46.8	9 48.4	9 20.0	7	.5	67	4.4	127	8.4
8	9 47.0	9 48.6	9 20.3	8	.5	68	4.5	128	8.4
9	9 47.3	9 48.9	9 20.5	9	.6	69	4.5	129	8.5
10	9 47.5	9 49.1	9 20.7	10	.7	70	4.6	130	8.6
11	9 47.8	9 49.4	9 21.0	11	.7	71	4.7	131	8.6
12	9 48.0	9 49.6	9 21.2	12	.8	72	4.7	132	8.7
13	9 48.3	9 49.9	9 21.5	13	.9	73	4.8	133	8.8
14	9 48.5	9 50.1	9 21.7	14	.9	74	4.9	134	8.8
15	9 48.8	9 50.4	9 21.9	15	1.0	75	4.9	135	8.9
16	9 49.0	9 50.6	9 22.2	16	1.1	76	5.0	136	9.0
17	9 49.3	9 50.9	9 22.4	17	1.1	77	5.1	137	9.0
18	9 49.5	9 51.1	9 22.6	18	1.2	78	5.1	138	9.1
19	9 49.8	9 51.4	9 22.9	19	1.3	79	5.2	139	9.2
20	9 50.0	9 51.6	9 23.1	20	1.3	80	5.3	140	9.2
21	9 50.3	9 51.9	9 23.4	21	1.4	81	5.3	141	9.3
22	9 50.5	9 52.1	9 23.6	22	1.4	82	5.4	142	9.3
23	9 50.8	9 52.4	9 23.8	23	1.5	83	5.5	143	9.4
24	9 51.0	9 52.6	9 24.1	24	1.6	84	5.5	144	9.5
25	9 51.3	9 52.9	9 24.3	25	1.6	85	5.6	145	9.5
26	9 51.5	9 53.1	9 24.6	26	1.7	86	5.7	146	9.6
27	9 51.8	9 53.4	9 24.8	27	1.8	87	5.7	147	9.7
28	9 52.0	9 53.6	9 25.0	28	1.8	88	5.8	148	9.7
29	9 52.3	9 53.9	9 25.3	29	1.9	89	5.9	149	9.8
30	9 52.5	9 54.1	9 25.5	30	2.0	90	5.9	150	9.9
31	9 52.8	9 54.4	9 25.7	31	2.0	91	6.0	151	9.9
32	9 53.0	9 54.6	9 26.0	32	2.1	92	6.1	152	10.0
33	9 53.3	9 54.9	9 26.2	33	2.2	93	6.1	153	10.1
34	9 53.5	9 55.1	9 26.5	34	2.2	94	6.2	154	10.1
35	9 53.8	9 55.4	9 26.7	35	2.3	95	6.3	155	10.2
36	9 54.0	9 55.7	9 26.9	36	2.4	96	6.3	156	10.3
37	9 54.3	9 55.9	9 27.2	37	2.4	97	6.4	157	10.3
38	9 54.5	9 56.2	9 27.4	38	2.5	98	6.5	158	10.4
39	9 54.8	9 56.4	9 27.7	39	2.6	99	6.5	159	10.5
40	9 55.0	9 56.7	9 27.9	40	2.6	100	6.6	160	10.5
41	9 55.3	9 56.9	9 28.1	41	2.7	101	6.6	161	10.6
42	9 55.5	9 57.2	9 28.4	42	2.8	102	6.7	162	10.7
43	9 55.8	9 57.4	9 28.6	43	2.8	103	6.8	163	10.7
44	9 56.0	9 57.7	9 28.8	44	2.9	104	6.8	164	10.8
45	9 56.3	9 57.9	9 29.1	45	3.0	105	6.9	165	10.9
46	9 56.5	9 58.2	9 29.3	46	3.0	106	7.0	166	10.9
47	9 56.8	9 58.4	9 29.6	47	3.1	107	7.0	167	11.0
48	9 57.0	9 58.7	9 29.8	48	3.2	108	7.1	168	11.1
49	9 57.3	9 58.9	9 30.0	49	3.2	109	7.2	169	11.1
50	9 57.5	9 59.2	9 30.3	50	3.3	110	7.2	170	11.2
51	9 57.8	9 59.4	9 30.5	51	3.4	111	7.3	171	11.3
52	9 58.0	9 59.7	9 30.8	52	3.4	112	7.4	172	11.3
53	9 58.3	9 59.9	9 31.0	53	3.5	113	7.4	173	11.4
54	9 58.5	10 .2	9 31.2	54	3.6	114	7.5	174	11.5
55	9 58.8	10 .4	9 31.5	55	3.6	115	7.6	175	11.5
56	9 59.0	10 .7	9 31.7	56	3.7	116	7.6	176	11.6
57	9 59.3	10 .9	9 32.0	57	3.8	117	7.7	177	11.7
58	9 59.5	10 1.2	9 32.2	58	3.8	118	7.8	178	11.7
59	9 59.8	10 1.4	9 32.4	59	3.9	119	7.8	179	11.8
60	10 .0	10 1.7	9 32.7	60	4.0	120	7.9	180	11.9

0 h 40 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	10	.0	10	1.7	9	32.7	0	.0	60	4.1	120	8.1
1	10	.3	10	1.9	9	32.9	1	.1	61	4.1	121	8.2
2	10	.5	10	2.2	9	33.1	2	.1	62	4.2	122	8.2
3	10	.8	10	2.4	9	33.4	3	.2	63	4.3	123	8.3
4	10	1.0	10	2.7	9	33.6	4	.3	64	4.3	124	8.4
5	10	1.3	10	2.9	9	33.9	5	.3	65	4.4	125	8.4
6	10	1.5	10	3.2	9	34.1	6	.4	66	4.5	126	8.5
7	10	1.8	10	3.4	9	34.3	7	.5	67	4.5	127	8.6
8	10	2.0	10	3.7	9	34.6	8	.5	68	4.6	128	8.6
9	10	2.3	10	3.9	9	34.8	9	.6	69	4.7	129	8.7
10	10	2.5	10	4.2	9	35.1	10	.7	70	4.7	130	8.8
11	10	2.8	10	4.4	9	35.3	11	.7	71	4.8	131	8.8
12	10	3.0	10	4.7	9	35.5	12	.8	72	4.9	132	8.9
13	10	3.3	10	4.9	9	35.8	13	.9	73	4.9	133	9.0
14	10	3.5	10	5.2	9	36.0	14	.9	74	5.0	134	9.0
15	10	3.8	10	5.4	9	36.2	15	1.0	75	5.1	135	9.1
16	10	4.0	10	5.7	9	36.5	16	1.1	76	5.1	136	9.2
17	10	4.3	10	5.9	9	36.7	17	1.1	77	5.2	137	9.2
18	10	4.5	10	6.2	9	37.0	18	1.2	78	5.3	138	9.3
19	10	4.8	10	6.4	9	37.2	19	1.3	79	5.3	139	9.4
20	10	5.0	10	6.7	9	37.4	20	1.4	80	5.4	140	9.5
21	10	5.3	10	6.9	9	37.7	21	1.4	81	5.5	141	9.5
22	10	5.5	10	7.2	9	37.9	22	1.5	82	5.5	142	9.6
23	10	5.8	10	7.4	9	38.2	23	1.6	83	5.6	143	9.7
24	10	6.0	10	7.7	9	38.4	24	1.6	84	5.7	144	9.7
25	10	6.3	10	7.9	9	38.6	25	1.7	85	5.7	145	9.8
26	10	6.5	10	8.2	9	38.9	26	1.8	86	5.8	146	9.9
27	10	6.8	10	8.4	9	39.1	27	1.8	87	5.9	147	9.9
28	10	7.0	10	8.7	9	39.3	28	1.9	88	5.9	148	10.0
29	10	7.3	10	8.9	9	39.6	29	2.0	89	6.0	149	10.1
30	10	7.5	10	9.2	9	39.8	30	2.0	90	6.1	150	10.1
31	10	7.8	10	9.4	9	40.1	31	2.1	91	6.1	151	10.2
32	10	8.0	10	9.7	9	40.3	32	2.2	92	6.2	152	10.3
33	10	8.3	10	9.9	9	40.5	33	2.2	93	6.3	153	10.3
34	10	8.5	10	10.2	9	40.8	34	2.3	94	6.3	154	10.4
35	10	8.8	10	10.4	9	41.0	35	2.4	95	6.4	155	10.5
36	10	9.0	10	10.7	9	41.3	36	2.4	96	6.5	156	10.5
37	10	9.3	10	10.9	9	41.5	37	2.5	97	6.5	157	10.6
38	10	9.5	10	11.2	9	41.7	38	2.6	98	6.6	158	10.7
39	10	9.8	10	11.4	9	42.0	39	2.6	99	6.7	159	10.7
40	10	10.0	10	11.7	9	42.2	40	2.7	100	6.8	160	10.8
41	10	10.3	10	11.9	9	42.4	41	2.8	101	6.8	161	10.9
42	10	10.5	10	12.2	9	42.7	42	2.8	102	6.9	162	10.9
43	10	10.8	10	12.4	9	42.9	43	2.9	103	7.0	163	11.0
44	10	11.0	10	12.7	9	43.2	44	3.0	104	7.0	164	11.1
45	10	11.3	10	12.9	9	43.4	45	3.0	105	7.1	165	11.1
46	10	11.5	10	13.2	9	43.6	46	3.1	106	7.2	166	11.2
47	10	11.8	10	13.4	9	43.9	47	3.2	107	7.2	167	11.3
48	10	12.0	10	13.7	9	44.1	48	3.2	108	7.3	168	11.3
49	10	12.3	10	14.0	9	44.4	49	3.3	109	7.4	169	11.4
50	10	12.5	10	14.2	9	44.6	50	3.4	110	7.4	170	11.5
51	10	12.8	10	14.5	9	44.8	51	3.4	111	7.5	171	11.5
52	10	13.0	10	14.7	9	45.1	52	3.5	112	7.6	172	11.6
53	10	13.3	10	15.0	9	45.3	53	3.6	113	7.6	173	11.7
54	10	13.5	10	15.2	9	45.6	54	3.6	114	7.7	174	11.7
55	10	13.8	10	15.5	9	45.8	55	3.7	115	7.8	175	11.8
56	10	14.0	10	15.7	9	46.0	56	3.8	116	7.8	176	11.9
57	10	14.3	10	16.0	9	46.3	57	3.8	117	7.9	177	11.9
58	10	14.5	10	16.2	9	46.5	58	3.9	118	8.0	178	12.0
59	10	14.8	10	16.5	9	46.7	59	4.0	119	8.0	179	12.1
60	10	15.0	10	16.7	9	47.0	60	4.1	120	8.1	180	12.2

0 h 41 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	10	15.0	10	16.7	9	47.0	0	.0	60	4.2	120	8.3
1	10	15.3	10	17.0	9	47.2	1	.1	61	4.2	121	8.4
2	10	15.5	10	17.2	9	47.5	2	.1	62	4.3	122	8.4
3	10	15.8	10	17.5	9	47.7	3	.2	63	4.4	123	8.5
4	10	16.0	10	17.7	9	47.9	4	.3	64	4.4	124	8.6
5	10	16.3	10	18.0	9	48.2	5	.3	65	4.5	125	8.6
6	10	16.5	10	18.2	9	48.4	6	.4	66	4.6	126	8.7
7	10	16.8	10	18.5	9	48.7	7	.5	67	4.6	127	8.8
8	10	17.0	10	18.7	9	48.9	8	.6	68	4.7	128	8.9
9	10	17.3	10	19.0	9	49.1	9	.6	69	4.8	129	8.9
10	10	17.5	10	19.2	9	49.4	10	.7	70	4.8	130	9.0
11	10	17.8	10	19.5	9	49.6	11	.8	71	4.9	131	9.1
12	10	18.0	10	19.7	9	49.8	12	.8	72	5.0	132	9.1
13	10	18.3	10	20.0	9	50.1	13	.9	73	5.0	133	9.2
14	10	18.5	10	20.2	9	50.3	14	1.0	74	5.1	134	9.3
15	10	18.8	10	20.5	9	50.6	15	1.0	75	5.2	135	9.3
16	10	19.0	10	20.7	9	50.8	16	1.1	76	5.3	136	9.4
17	10	19.3	10	21.0	9	51.0	17	1.2	77	5.3	137	9.5
18	10	19.5	10	21.2	9	51.3	18	1.2	78	5.4	138	9.5
19	10	19.8	10	21.5	9	51.5	19	1.3	79	5.5	139	9.6
20	10	20.0	10	21.7	9	51.8	20	1.4	80	5.5	140	9.7
21	10	20.3	10	22.0	9	52.0	21	1.5	81	5.6	141	9.8
22	10	20.5	10	22.2	9	52.2	22	1.5	82	5.7	142	9.8
23	10	20.8	10	22.5	9	52.5	23	1.6	83	5.7	143	9.9
24	10	21.0	10	22.7	9	52.7	24	1.7	84	5.8	144	10.0
25	10	21.3	10	23.0	9	52.9	25	1.7	85	5.9	145	10.0
26	10	21.5	10	23.2	9	53.2	26	1.8	86	5.9	146	10.1
27	10	21.8	10	23.5	9	53.4	27	1.9	87	6.0	147	10.2
28	10	22.0	10	23.7	9	53.7	28	1.9	88	6.1	148	10.2
29	10	22.3	10	24.0	9	53.9	29	2.0	89	6.2	149	10.3
30	10	22.5	10	24.2	9	54.1	30	2.1	90	6.2	150	10.4
31	10	22.8	10	24.5	9	54.4	31	2.1	91	6.3	151	10.4
32	10	23.0	10	24.7	9	54.6	32	2.2	92	6.4	152	10.5
33	10	23.3	10	25.0	9	54.9	33	2.3	93	6.4	153	10.6
34	10	23.5	10	25.2	9	55.1	34	2.4	94	6.5	154	10.7
35	10	23.8	10	25.5	9	55.3	35	2.4	95	6.6	155	10.7
36	10	24.0	10	25.7	9	55.6	36	2.5	96	6.6	156	10.8
37	10	24.3	10	26.0	9	55.8	37	2.6	97	6.7	157	10.9
38	10	24.5	10	26.2	9	56.1	38	2.6	98	6.8	158	10.9
39	10	24.8	10	26.5	9	56.3	39	2.7	99	6.8	159	11.0
40	10	25.0	10	26.7	9	56.5	40	2.8	100	6.9	160	11.1
41	10	25.3	10	27.0	9	56.8	41	2.8	101	7.0	161	11.1
42	10	25.5	10	27.2	9	57.0	42	2.9	102	7.1	162	11.2
43	10	25.8	10	27.5	9	57.2	43	3.0	103	7.1	163	11.3
44	10	26.0	10	27.7	9	57.5	44	3.0	104	7.2	164	11.3
45	10	26.3	10	28.0	9	57.7	45	3.1	105	7.3	165	11.4
46	10	26.5	10	28.2	9	58.0	46	3.2	106	7.3	166	11.5
47	10	26.8	10	28.5	9	58.2	47	3.3	107	7.4	167	11.6
48	10	27.0	10	28.7	9	58.4	48	3.3	108	7.5	168	11.6
49	10	27.3	10	29.0	9	58.7	49	3.4	109	7.5	169	11.7
50	10	27.5	10	29.2	9	58.9	50	3.5	110	7.6	170	11.8
51	10	27.8	10	29.5	9	59.2	51	3.5	111	7.7	171	11.8
52	10	28.0	10	29.7	9	59.4	52	3.6	112	7.7	172	11.9
53	10	28.3	10	30.0	9	59.6	53	3.7	113	7.8	173	12.0
54	10	28.5	10	30.2	9	59.9	54	3.7	114	7.9	174	12.0
55	10	28.8	10	30.5	10	.1	55	3.8	115	8.0	175	12.1
56	10	29.0	10	30.7	10	.3	56	3.9	116	8.0	176	12.2
57	10	29.3	10	31.0	10	.6	57	3.9	117	8.1	177	12.2
58	10	29.5	10	31.2	10	.8	58	4.0	118	8.2	178	12.3
59	10	29.8	10	31.5	10	1.1	59	4.1	119	8.2	179	12.4
60	10	30.0	10	31.8	10	1.3	60	4.2	120	8.3	180	12.5

0 h 42 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 30.0	10 31.8	10 1.3	0	.0	60	4.3	120	8.5
1	10 30.3	10 32.0	10 1.5	1	.1	61	4.3	121	8.6
2	10 30.5	10 32.3	10 1.8	2	.1	62	4.4	122	8.6
3	10 30.8	10 32.5	10 2.0	3	.2	63	4.5	123	8.7
4	10 31.0	10 32.8	10 2.3	4	.3	64	4.5	124	8.8
5	10 31.3	10 33.0	10 2.5	5	.4	65	4.6	125	8.9
6	10 31.5	10 33.3	10 2.7	6	.4	66	4.7	126	8.9
7	10 31.8	10 33.5	10 3.0	7	.5	67	4.7	127	9.0
8	10 32.0	10 33.8	10 3.2	8	.6	68	4.8	128	9.1
9	10 32.3	10 34.0	10 3.4	9	.6	69	4.9	129	9.1
10	10 32.5	10 34.3	10 3.7	10	.7	70	5.0	130	9.2
11	10 32.8	10 34.5	10 3.9	11	.8	71	5.0	131	9.3
12	10 33.0	10 34.8	10 4.2	12	.9	72	5.1	132	9.4
13	10 33.3	10 35.0	10 4.4	13	.9	73	5.2	133	9.4
14	10 33.5	10 35.3	10 4.6	14	1.0	74	5.2	134	9.5
15	10 33.8	10 35.5	10 4.9	15	1.1	75	5.3	135	9.6
16	10 34.0	10 35.8	10 5.1	16	1.1	76	5.4	136	9.6
17	10 34.3	10 36.0	10 5.4	17	1.2	77	5.5	137	9.7
18	10 34.5	10 36.3	10 5.6	18	1.3	78	5.5	138	9.8
19	10 34.8	10 36.5	10 5.8	19	1.3	79	5.6	139	9.8
20	10 35.0	10 36.8	10 6.1	20	1.4	80	5.7	140	9.9
21	10 35.3	10 37.0	10 6.3	21	1.5	81	5.7	141	10.0
22	10 35.5	10 37.3	10 6.5	22	1.6	82	5.8	142	10.1
23	10 35.8	10 37.5	10 6.8	23	1.6	83	5.9	143	10.1
24	10 36.0	10 37.8	10 7.0	24	1.7	84	6.0	144	10.2
25	10 36.3	10 38.0	10 7.3	25	1.8	85	6.0	145	10.3
26	10 36.5	10 38.3	10 7.5	26	1.8	86	6.1	146	10.3
27	10 36.8	10 38.5	10 7.7	27	1.9	87	6.2	147	10.4
28	10 37.0	10 38.8	10 8.0	28	2.0	88	6.2	148	10.5
29	10 37.3	10 39.0	10 8.2	29	2.1	89	6.3	149	10.6
30	10 37.5	10 39.3	10 8.5	30	2.1	90	6.4	150	10.6
31	10 37.8	10 39.5	10 8.7	31	2.2	91	6.4	151	10.7
32	10 38.0	10 39.8	10 8.9	32	2.3	92	6.5	152	10.8
33	10 38.3	10 40.0	10 9.2	33	2.3	93	6.6	153	10.8
34	10 38.5	10 40.3	10 9.4	34	2.4	94	6.7	154	10.9
35	10 38.8	10 40.5	10 9.7	35	2.5	95	6.7	155	11.0
36	10 39.0	10 40.8	10 9.9	36	2.6	96	6.8	156	11.1
37	10 39.3	10 41.0	10 10.1	37	2.6	97	6.9	157	11.1
38	10 39.5	10 41.3	10 10.4	38	2.7	98	6.9	158	11.2
39	10 39.8	10 41.5	10 10.6	39	2.8	99	7.0	159	11.3
40	10 40.0	10 41.8	10 10.8	40	2.8	100	7.1	160	11.3
41	10 40.3	10 42.0	10 11.1	41	2.9	101	7.2	161	11.4
42	10 40.5	10 42.3	10 11.3	42	3.0	102	7.2	162	11.5
43	10 40.8	10 42.5	10 11.6	43	3.0	103	7.3	163	11.5
44	10 41.0	10 42.8	10 11.8	44	3.1	104	7.4	164	11.6
45	10 41.3	10 43.0	10 12.0	45	3.2	105	7.4	165	11.7
46	10 41.5	10 43.3	10 12.3	46	3.3	106	7.5	166	11.8
47	10 41.8	10 43.5	10 12.5	47	3.3	107	7.6	167	11.8
48	10 42.0	10 43.8	10 12.8	48	3.4	108	7.7	168	11.9
49	10 42.3	10 44.0	10 13.0	49	3.5	109	7.7	169	12.0
50	10 42.5	10 44.3	10 13.2	50	3.5	110	7.8	170	12.0
51	10 42.8	10 44.5	10 13.5	51	3.6	111	7.9	171	12.1
52	10 43.0	10 44.8	10 13.7	52	3.7	112	7.9	172	12.2
53	10 43.3	10 45.0	10 13.9	53	3.8	113	8.0	173	12.3
54	10 43.5	10 45.3	10 14.2	54	3.8	114	8.1	174	12.3
55	10 43.8	10 45.5	10 14.4	55	3.9	115	8.1	175	12.4
56	10 44.0	10 45.8	10 14.7	56	4.0	116	8.2	176	12.5
57	10 44.3	10 46.0	10 14.9	57	4.0	117	8.3	177	12.5
58	10 44.5	10 46.3	10 15.1	58	4.1	118	8.4	178	12.6
59	10 44.8	10 46.5	10 15.4	59	4.2	119	8.4	179	12.7
60	10 45.0	10 46.8	10 15.6	60	4.3	120	8.5	180	12.8

0 h 43 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	10 45.0	10 46.8	10 15.6	0	.0	60	4.4	120	8.7
1	10 45.3	10 47.0	10 15.9	1	.1	61	4.4	121	8.8
2	10 45.5	10 47.3	10 16.1	2	.1	62	4.5	122	8.8
3	10 45.8	10 47.5	10 16.3	3	.2	63	4.6	123	8.9
4	10 46.0	10 47.8	10 16.6	4	.3	64	4.6	124	9.0
5	10 46.3	10 48.0	10 16.8	5	.4	65	4.7	125	9.1
6	10 46.5	10 48.3	10 17.0	6	.4	66	4.8	126	9.1
7	10 46.8	10 48.5	10 17.3	7	.5	67	4.9	127	9.2
8	10 47.0	10 48.8	10 17.5	8	.6	68	4.9	128	9.3
9	10 47.3	10 49.0	10 17.8	9	.7	69	5.0	129	9.4
10	10 47.5	10 49.3	10 18.0	10	.7	70	5.1	130	9.4
11	10 47.8	10 49.5	10 18.2	11	.8	71	5.1	131	9.5
12	10 48.0	10 49.8	10 18.5	12	.9	72	5.2	132	9.6
13	10 48.3	10 50.1	10 18.7	13	.9	73	5.3	133	9.6
14	10 48.5	10 50.3	10 19.0	14	1.0	74	5.4	134	9.7
15	10 48.8	10 50.6	10 19.2	15	1.1	75	5.4	135	9.8
16	10 49.0	10 50.8	10 19.4	16	1.2	76	5.5	136	9.9
17	10 49.3	10 51.1	10 19.7	17	1.2	77	5.6	137	9.9
18	10 49.5	10 51.3	10 19.9	18	1.3	78	5.7	138	10.0
19	10 49.8	10 51.6	10 20.2	19	1.4	79	5.7	139	10.1
20	10 50.0	10 51.8	10 20.4	20	1.5	80	5.8	140	10.2
21	10 50.3	10 52.1	10 20.6	21	1.5	81	5.9	141	10.2
22	10 50.5	10 52.3	10 20.9	22	1.6	82	5.9	142	10.3
23	10 50.8	10 52.6	10 21.1	23	1.7	83	6.0	143	10.4
24	10 51.0	10 52.8	10 21.3	24	1.7	84	6.1	144	10.4
25	10 51.3	10 53.1	10 21.6	25	1.8	85	6.2	145	10.5
26	10 51.5	10 53.3	10 21.8	26	1.9	86	6.2	146	10.6
27	10 51.8	10 53.6	10 22.1	27	2.0	87	6.3	147	10.7
28	10 52.0	10 53.8	10 22.3	28	2.0	88	6.4	148	10.7
29	10 52.3	10 54.1	10 22.5	29	2.1	89	6.5	149	10.8
30	10 52.5	10 54.3	10 22.8	30	2.2	90	6.5	150	10.9
31	10 52.8	10 54.6	10 23.0	31	2.2	91	6.6	151	10.9
32	10 53.0	10 54.8	10 23.3	32	2.3	92	6.7	152	11.0
33	10 53.3	10 55.1	10 23.5	33	2.4	93	6.7	153	11.1
34	10 53.5	10 55.3	10 23.7	34	2.5	94	6.8	154	11.2
35	10 53.8	10 55.6	10 24.0	35	2.5	95	6.9	155	11.2
36	10 54.0	10 55.8	10 24.2	36	2.6	96	7.0	156	11.3
37	10 54.3	10 56.1	10 24.4	37	2.7	97	7.0	157	11.4
38	10 54.5	10 56.3	10 24.7	38	2.8	98	7.1	158	11.5
39	10 54.8	10 56.6	10 24.9	39	2.8	99	7.2	159	11.5
40	10 55.0	10 56.8	10 25.2	40	2.9	100	7.3	160	11.6
41	10 55.3	10 57.1	10 25.4	41	3.0	101	7.3	161	11.7
42	10 55.5	10 57.3	10 25.6	42	3.0	102	7.4	162	11.7
43	10 55.8	10 57.6	10 25.9	43	3.1	103	7.5	163	11.8
44	10 56.0	10 57.8	10 26.1	44	3.2	104	7.5	164	11.9
45	10 56.3	10 58.1	10 26.4	45	3.3	105	7.6	165	12.0
46	10 56.5	10 58.3	10 26.6	46	3.3	106	7.7	166	12.0
47	10 56.8	10 58.6	10 26.8	47	3.4	107	7.8	167	12.1
48	10 57.0	10 58.8	10 27.1	48	3.5	108	7.8	168	12.2
49	10 57.3	10 59.1	10 27.3	49	3.6	109	7.9	169	12.3
50	10 57.5	10 59.3	10 27.5	50	3.6	110	8.0	170	12.3
51	10 57.8	10 59.6	10 27.8	51	3.7	111	8.0	171	12.4
52	10 58.0	10 59.8	10 28.0	52	3.8	112	8.1	172	12.5
53	10 58.3	11 .1	10 28.3	53	3.8	113	8.2	173	12.5
54	10 58.5	11 .3	10 28.5	54	3.9	114	8.3	174	12.6
55	10 58.8	11 .6	10 28.7	55	4.0	115	8.3	175	12.7
56	10 59.0	11 .8	10 29.0	56	4.1	116	8.4	176	12.8
57	10 59.3	11 1.1	10 29.2	57	4.1	117	8.5	177	12.8
58	10 59.5	11 1.3	10 29.5	58	4.2	118	8.6	178	12.9
59	10 59.8	11 1.6	10 29.7	59	4.3	119	8.6	179	13.0
60	11 .0	11 1.8	10 29.9	60	4.4	120	8.7	180	13.1

0 h 44 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	11	.0	11	1.8	10	29.9	0	.0	60	4.5	120	8.9
1	11	.3	11	2.1	10	30.2	1	.1	61	4.5	121	9.0
2	11	.5	11	2.3	10	30.4	2	.1	62	4.6	122	9.0
3	11	.8	11	2.6	10	30.6	3	.2	63	4.7	123	9.1
4	11	1.0	11	2.8	10	30.9	4	.3	64	4.7	124	9.2
5	11	1.3	11	3.1	10	31.1	5	.4	65	4.8	125	9.3
6	11	1.5	11	3.3	10	31.4	6	.4	66	4.9	126	9.3
7	11	1.8	11	3.6	10	31.6	7	.5	67	5.0	127	9.4
8	11	2.0	11	3.8	10	31.8	8	.6	68	5.0	128	9.5
9	11	2.3	11	4.1	10	32.1	9	.7	69	5.1	129	9.6
10	11	2.5	11	4.3	10	32.3	10	.7	70	5.2	130	9.6
11	11	2.8	11	4.6	10	32.6	11	.8	71	5.3	131	9.7
12	11	3.0	11	4.8	10	32.8	12	.9	72	5.3	132	9.8
13	11	3.3	11	5.1	10	33.0	13	1.0	73	5.4	133	9.9
14	11	3.5	11	5.3	10	33.3	14	1.0	74	5.5	134	9.9
15	11	3.8	11	5.6	10	33.5	15	1.1	75	5.6	135	10.0
16	11	4.0	11	5.8	10	33.8	16	1.2	76	5.6	136	10.1
17	11	4.3	11	6.1	10	34.0	17	1.3	77	5.7	137	10.2
18	11	4.5	11	6.3	10	34.2	18	1.3	78	5.8	138	10.2
19	11	4.8	11	6.6	10	34.5	19	1.4	79	5.9	139	10.3
20	11	5.0	11	6.8	10	34.7	20	1.5	80	5.9	140	10.4
21	11	5.3	11	7.1	10	34.9	21	1.6	81	6.0	141	10.5
22	11	5.5	11	7.3	10	35.2	22	1.6	82	6.1	142	10.5
23	11	5.8	11	7.6	10	35.4	23	1.7	83	6.2	143	10.6
24	11	6.0	11	7.9	10	35.7	24	1.8	84	6.2	144	10.7
25	11	6.3	11	8.1	10	35.9	25	1.9	85	6.3	145	10.8
26	11	6.5	11	8.4	10	36.1	26	1.9	86	6.4	146	10.8
27	11	6.8	11	8.6	10	36.4	27	2.0	87	6.5	147	10.9
28	11	7.0	11	8.9	10	36.6	28	2.1	88	6.5	148	11.0
29	11	7.3	11	9.1	10	36.9	29	2.2	89	6.6	149	11.1
30	11	7.5	11	9.4	10	37.1	30	2.2	90	6.7	150	11.1
31	11	7.8	11	9.6	10	37.3	31	2.3	91	6.7	151	11.2
32	11	8.0	11	9.9	10	37.6	32	2.4	92	6.8	152	11.3
33	11	8.3	11	10.1	10	37.8	33	2.4	93	6.9	153	11.3
34	11	8.5	11	10.4	10	38.0	34	2.5	94	7.0	154	11.4
35	11	8.8	11	10.6	10	38.3	35	2.6	95	7.0	155	11.5
36	11	9.0	11	10.9	10	38.5	36	2.7	96	7.1	156	11.6
37	11	9.3	11	11.1	10	38.8	37	2.7	97	7.2	157	11.6
38	11	9.5	11	11.4	10	39.0	38	2.8	98	7.3	158	11.7
39	11	9.8	11	11.6	10	39.2	39	2.9	99	7.3	159	11.8
40	11	10.0	11	11.9	10	39.5	40	3.0	100	7.4	160	11.9
41	11	10.3	11	12.1	10	39.7	41	3.0	101	7.5	161	11.9
42	11	10.5	11	12.4	10	40.0	42	3.1	102	7.6	162	12.0
43	11	10.8	11	12.6	10	40.2	43	3.2	103	7.6	163	12.1
44	11	11.0	11	12.9	10	40.4	44	3.3	104	7.7	164	12.2
45	11	11.3	11	13.1	10	40.7	45	3.3	105	7.8	165	12.2
46	11	11.5	11	13.4	10	40.9	46	3.4	106	7.9	166	12.3
47	11	11.8	11	13.6	10	41.1	47	3.5	107	7.9	167	12.4
48	11	12.0	11	13.9	10	41.4	48	3.6	108	8.0	168	12.5
49	11	12.3	11	14.1	10	41.6	49	3.6	109	8.1	169	12.5
50	11	12.5	11	14.4	10	41.9	50	3.7	110	8.2	170	12.6
51	11	12.8	11	14.6	10	42.1	51	3.8	111	8.2	171	12.7
52	11	13.0	11	14.9	10	42.3	52	3.9	112	8.3	172	12.8
53	11	13.3	11	15.1	10	42.6	53	3.9	113	8.4	173	12.8
54	11	13.5	11	15.4	10	42.8	54	4.0	114	8.5	174	12.9
55	11	13.8	11	15.6	10	43.1	55	4.1	115	8.5	175	13.0
56	11	14.0	11	15.9	10	43.3	56	4.2	116	8.6	176	13.1
57	11	14.3	11	16.1	10	43.5	57	4.2	117	8.7	177	13.1
58	11	14.5	11	16.4	10	43.8	58	4.3	118	8.8	178	13.2
59	11	14.8	11	16.6	10	44.0	59	4.4	119	8.8	179	13.3
60	11	15.0	11	16.9	10	44.3	60	4.5	120	8.9	180	13.4

0 h 45 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	11	15.0	11	16.9	10	44.3	0	.0	60	4.6	120	9.1
1	11	15.3	11	17.1	10	44.5	1	.1	61	4.6	121	9.2
2	11	15.5	11	17.4	10	44.7	2	.2	62	4.7	122	9.3
3	11	15.8	11	17.6	10	45.0	3	.2	63	4.8	123	9.3
4	11	16.0	11	17.9	10	45.2	4	.3	64	4.9	124	9.4
5	11	16.3	11	18.1	10	45.4	5	.4	65	4.9	125	9.5
6	11	16.5	11	18.4	10	45.7	6	.5	66	5.0	126	9.6
7	11	16.8	11	18.6	10	45.9	7	.5	67	5.1	127	9.6
8	11	17.0	11	18.9	10	46.2	8	.6	68	5.2	128	9.7
9	11	17.3	11	19.1	10	46.4	9	.7	69	5.2	129	9.8
10	11	17.5	11	19.4	10	46.6	10	.8	70	5.3	130	9.9
11	11	17.8	11	19.6	10	46.9	11	.8	71	5.4	131	9.9
12	11	18.0	11	19.9	10	47.1	12	.9	72	5.5	132	10.0
13	11	18.3	11	20.1	10	47.4	13	1.0	73	5.5	133	10.1
14	11	18.5	11	20.4	10	47.6	14	1.1	74	5.6	134	10.2
15	11	18.8	11	20.6	10	47.8	15	1.1	75	5.7	135	10.2
16	11	19.0	11	20.9	10	48.1	16	1.2	76	5.8	136	10.3
17	11	19.3	11	21.1	10	48.3	17	1.3	77	5.8	137	10.4
18	11	19.5	11	21.4	10	48.5	18	1.4	78	5.9	138	10.5
19	11	19.8	11	21.6	10	48.8	19	1.4	79	6.0	139	10.5
20	11	20.0	11	21.9	10	49.0	20	1.5	80	6.1	140	10.6
21	11	20.3	11	22.1	10	49.3	21	1.6	81	6.1	141	10.7
22	11	20.5	11	22.4	10	49.5	22	1.7	82	6.2	142	10.8
23	11	20.8	11	22.6	10	49.7	23	1.7	83	6.3	143	10.8
24	11	21.0	11	22.9	10	50.0	24	1.8	84	6.4	144	10.9
25	11	21.3	11	23.1	10	50.2	25	1.9	85	6.4	145	11.0
26	11	21.5	11	23.4	10	50.5	26	2.0	86	6.5	146	11.1
27	11	21.8	11	23.6	10	50.7	27	2.0	87	6.6	147	11.1
28	11	22.0	11	23.9	10	50.9	28	2.1	88	6.7	148	11.2
29	11	22.3	11	24.1	10	51.2	29	2.2	89	6.7	149	11.3
30	11	22.5	11	24.4	10	51.4	30	2.3	90	6.8	150	11.4
31	11	22.8	11	24.6	10	51.6	31	2.4	91	6.9	151	11.5
32	11	23.0	11	24.9	10	51.9	32	2.4	92	7.0	152	11.5
33	11	23.3	11	25.1	10	52.1	33	2.5	93	7.1	153	11.6
34	11	23.5	11	25.4	10	52.4	34	2.6	94	7.1	154	11.7
35	11	23.8	11	25.6	10	52.6	35	2.7	95	7.2	155	11.8
36	11	24.0	11	25.9	10	52.8	36	2.7	96	7.3	156	11.8
37	11	24.3	11	26.2	10	53.1	37	2.8	97	7.4	157	11.9
38	11	24.5	11	26.4	10	53.3	38	2.9	98	7.4	158	12.0
39	11	24.8	11	26.7	10	53.6	39	3.0	99	7.5	159	12.1
40	11	25.0	11	26.9	10	53.8	40	3.0	100	7.6	160	12.1
41	11	25.3	11	27.2	10	54.0	41	3.1	101	7.7	161	12.2
42	11	25.5	11	27.4	10	54.3	42	3.2	102	7.7	162	12.3
43	11	25.8	11	27.7	10	54.5	43	3.3	103	7.8	163	12.4
44	11	26.0	11	27.9	10	54.7	44	3.3	104	7.9	164	12.4
45	11	26.3	11	28.2	10	55.0	45	3.4	105	8.0	165	12.5
46	11	26.5	11	28.4	10	55.2	46	3.5	106	8.0	166	12.6
47	11	26.8	11	28.7	10	55.5	47	3.6	107	8.1	167	12.7
48	11	27.0	11	28.9	10	55.7	48	3.6	108	8.2	168	12.7
49	11	27.3	11	29.2	10	55.9	49	3.7	109	8.3	169	12.8
50	11	27.5	11	29.4	10	56.2	50	3.8	110	8.3	170	12.9
51	11	27.8	11	29.7	10	56.4	51	3.9	111	8.4	171	13.0
52	11	28.0	11	29.9	10	56.7	52	3.9	112	8.5	172	13.0
53	11	28.3	11	30.2	10	56.9	53	4.0	113	8.6	173	13.1
54	11	28.5	11	30.4	10	57.1	54	4.1	114	8.6	174	13.2
55	11	28.8	11	30.7	10	57.4	55	4.2	115	8.7	175	13.3
56	11	29.0	11	30.9	10	57.6	56	4.2	116	8.8	176	13.3
57	11	29.3	11	31.2	10	57.9	57	4.3	117	8.9	177	13.4
58	11	29.5	11	31.4	10	58.1	58	4.4	118	8.9	178	13.5
59	11	29.8	11	31.7	10	58.3	59	4.5	119	9.0	179	13.6
60	11	30.0	11	31.9	10	58.6	60	4.6	120	9.1	180	13.7

0 h 46 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	11 30.0	11 31.9	10 58.6	0	.0	60	4.7	120	9.3
1	11 30.3	11 32.2	10 58.8	1	.1	61	4.7	121	9.4
2	11 30.5	11 32.4	10 59.0	2	.2	62	4.8	122	9.5
3	11 30.8	11 32.7	10 59.3	3	.2	63	4.9	123	9.5
4	11 31.0	11 32.9	10 59.5	4	.3	64	5.0	124	9.6
5	11 31.3	11 33.2	10 59.8	5	.4	65	5.0	125	9.7
6	11 31.5	11 33.4	10 60.0	6	.5	66	5.1	126	9.8
7	11 31.8	11 33.7	11 .2	7	.5	67	5.2	127	9.8
8	11 32.0	11 33.9	11 .5	8	.6	68	5.3	128	9.9
9	11 32.3	11 34.2	11 .7	9	.7	69	5.3	129	10.0
10	11 32.5	11 34.4	11 1.0	10	.8	70	5.4	130	10.1
11	11 32.8	11 34.7	11 1.2	11	.9	71	5.5	131	10.2
12	11 33.0	11 34.9	11 1.4	12	.9	72	5.6	132	10.2
13	11 33.3	11 35.2	11 1.7	13	1.0	73	5.7	133	10.3
14	11 33.5	11 35.4	11 1.9	14	1.1	74	5.7	134	10.4
15	11 33.8	11 35.7	11 2.1	15	1.2	75	5.8	135	10.5
16	11 34.0	11 35.9	11 2.4	16	1.2	76	5.9	136	10.5
17	11 34.3	11 36.2	11 2.6	17	1.3	77	6.0	137	10.6
18	11 34.5	11 36.4	11 2.9	18	1.4	78	6.0	138	10.7
19	11 34.8	11 36.7	11 3.1	19	1.5	79	6.1	139	10.8
20	11 35.0	11 36.9	11 3.3	20	1.6	80	6.2	140	10.9
21	11 35.3	11 37.2	11 3.6	21	1.6	81	6.3	141	10.9
22	11 35.5	11 37.4	11 3.8	22	1.7	82	6.4	142	11.0
23	11 35.8	11 37.7	11 4.1	23	1.8	83	6.4	143	11.1
24	11 36.0	11 37.9	11 4.3	24	1.9	84	6.5	144	11.2
25	11 36.3	11 38.2	11 4.5	25	1.9	85	6.6	145	11.2
26	11 36.5	11 38.4	11 4.8	26	2.0	86	6.7	146	11.3
27	11 36.8	11 38.7	11 5.0	27	2.1	87	6.7	147	11.4
28	11 37.0	11 38.9	11 5.2	28	2.2	88	6.8	148	11.5
29	11 37.3	11 39.2	11 5.5	29	2.2	89	6.9	149	11.5
30	11 37.5	11 39.4	11 5.7	30	2.3	90	7.0	150	11.6
31	11 37.8	11 39.7	11 6.0	31	2.4	91	7.1	151	11.7
32	11 38.0	11 39.9	11 6.2	32	2.5	92	7.1	152	11.8
33	11 38.3	11 40.2	11 6.4	33	2.6	93	7.2	153	11.9
34	11 38.5	11 40.4	11 6.7	34	2.6	94	7.3	154	11.9
35	11 38.8	11 40.7	11 6.9	35	2.7	95	7.4	155	12.0
36	11 39.0	11 40.9	11 7.2	36	2.8	96	7.4	156	12.1
37	11 39.3	11 41.2	11 7.4	37	2.9	97	7.5	157	12.2
38	11 39.5	11 41.4	11 7.6	38	2.9	98	7.6	158	12.2
39	11 39.8	11 41.7	11 7.9	39	3.0	99	7.7	159	12.3
40	11 40.0	11 41.9	11 8.1	40	3.1	100	7.8	160	12.4
41	11 40.3	11 42.2	11 8.3	41	3.2	101	7.8	161	12.5
42	11 40.5	11 42.4	11 8.6	42	3.3	102	7.9	162	12.6
43	11 40.8	11 42.7	11 8.8	43	3.3	103	8.0	163	12.6
44	11 41.0	11 42.9	11 9.1	44	3.4	104	8.1	164	12.7
45	11 41.3	11 43.2	11 9.3	45	3.5	105	8.1	165	12.8
46	11 41.5	11 43.4	11 9.5	46	3.6	106	8.2	166	12.9
47	11 41.8	11 43.7	11 9.8	47	3.6	107	8.3	167	12.9
48	11 42.0	11 44.0	11 10.0	48	3.7	108	8.4	168	13.0
49	11 42.3	11 44.2	11 10.3	49	3.8	109	8.4	169	13.1
50	11 42.5	11 44.5	11 10.5	50	3.9	110	8.5	170	13.2
51	11 42.8	11 44.7	11 10.7	51	4.0	111	8.6	171	13.3
52	11 43.0	11 45.0	11 11.0	52	4.0	112	8.7	172	13.3
53	11 43.3	11 45.2	11 11.2	53	4.1	113	8.8	173	13.4
54	11 43.5	11 45.5	11 11.5	54	4.2	114	8.8	174	13.5
55	11 43.8	11 45.7	11 11.7	55	4.3	115	8.9	175	13.6
56	11 44.0	11 46.0	11 11.9	56	4.3	116	9.0	176	13.6
57	11 44.3	11 46.2	11 12.2	57	4.4	117	9.1	177	13.7
58	11 44.5	11 46.5	11 12.4	58	4.5	118	9.1	178	13.8
59	11 44.8	11 46.7	11 12.6	59	4.6	119	9.2	179	13.9
60	11 45.0	11 47.0	11 12.9	60	4.7	120	9.3	180	14.0

0 h 47 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	11 45.0	11 47.0	11 12.9	0	.0	60	4.8	120	9.5
1	11 45.3	11 47.2	11 13.1	1	.1	61	4.8	121	9.6
2	11 45.5	11 47.5	11 13.4	2	.2	62	4.9	122	9.7
3	11 45.8	11 47.7	11 13.6	3	.2	63	5.0	123	9.7
4	11 46.0	11 48.0	11 13.8	4	.3	64	5.1	124	9.8
5	11 46.3	11 48.2	11 14.1	5	.4	65	5.1	125	9.9
6	11 46.5	11 48.5	11 14.3	6	.5	66	5.2	126	10.0
7	11 46.8	11 48.7	11 14.6	7	.6	67	5.3	127	10.1
8	11 47.0	11 49.0	11 14.8	8	.6	68	5.4	128	10.1
9	11 47.3	11 49.2	11 15.0	9	.7	69	5.5	129	10.2
10	11 47.5	11 49.5	11 15.3	10	.8	70	5.5	130	10.3
11	11 47.8	11 49.7	11 15.5	11	.9	71	5.6	131	10.4
12	11 48.0	11 50.0	11 15.7	12	1.0	72	5.7	132	10.5
13	11 48.3	11 50.2	11 16.0	13	1.0	73	5.8	133	10.5
14	11 48.5	11 50.5	11 16.2	14	1.1	74	5.9	134	10.6
15	11 48.8	11 50.7	11 16.5	15	1.2	75	5.9	135	10.7
16	11 49.0	11 51.0	11 16.7	16	1.3	76	6.0	136	10.8
17	11 49.3	11 51.2	11 16.9	17	1.3	77	6.1	137	10.8
18	11 49.5	11 51.5	11 17.2	18	1.4	78	6.2	138	10.9
19	11 49.8	11 51.7	11 17.4	19	1.5	79	6.3	139	11.0
20	11 50.0	11 52.0	11 17.7	20	1.6	80	6.3	140	11.1
21	11 50.3	11 52.2	11 17.9	21	1.7	81	6.4	141	11.2
22	11 50.5	11 52.5	11 18.1	22	1.7	82	6.5	142	11.2
23	11 50.8	11 52.7	11 18.4	23	1.8	83	6.6	143	11.3
24	11 51.0	11 53.0	11 18.6	24	1.9	84	6.7	144	11.4
25	11 51.3	11 53.2	11 18.8	25	2.0	85	6.7	145	11.5
26	11 51.5	11 53.5	11 19.1	26	2.1	86	6.8	146	11.6
27	11 51.8	11 53.7	11 19.3	27	2.1	87	6.9	147	11.6
28	11 52.0	11 54.0	11 19.6	28	2.2	88	7.0	148	11.7
29	11 52.3	11 54.2	11 19.8	29	2.3	89	7.0	149	11.8
30	11 52.5	11 54.5	11 20.0	30	2.4	90	7.1	150	11.9
31	11 52.8	11 54.7	11 20.3	31	2.5	91	7.2	151	12.0
32	11 53.0	11 55.0	11 20.5	32	2.5	92	7.3	152	12.0
33	11 53.3	11 55.2	11 20.8	33	2.6	93	7.4	153	12.1
34	11 53.5	11 55.5	11 21.0	34	2.7	94	7.4	154	12.2
35	11 53.8	11 55.7	11 21.2	35	2.8	95	7.5	155	12.3
36	11 54.0	11 56.0	11 21.5	36	2.9	96	7.6	156	12.4
37	11 54.3	11 56.2	11 21.7	37	2.9	97	7.7	157	12.4
38	11 54.5	11 56.5	11 22.0	38	3.0	98	7.8	158	12.5
39	11 54.8	11 56.7	11 22.2	39	3.1	99	7.8	159	12.6
40	11 55.0	11 57.0	11 22.4	40	3.2	100	7.9	160	12.7
41	11 55.3	11 57.2	11 22.7	41	3.2	101	8.0	161	12.7
42	11 55.5	11 57.5	11 22.9	42	3.3	102	8.1	162	12.8
43	11 55.8	11 57.7	11 23.1	43	3.4	103	8.2	163	12.9
44	11 56.0	11 58.0	11 23.4	44	3.5	104	8.2	164	13.0
45	11 56.3	11 58.2	11 23.6	45	3.6	105	8.3	165	13.1
46	11 56.5	11 58.5	11 23.9	46	3.6	106	8.4	166	13.1
47	11 56.8	11 58.7	11 24.1	47	3.7	107	8.5	167	13.2
48	11 57.0	11 59.0	11 24.3	48	3.8	108	8.6	168	13.3
49	11 57.3	11 59.2	11 24.6	49	3.9	109	8.6	169	13.4
50	11 57.5	11 59.5	11 24.8	50	4.0	110	8.7	170	13.5
51	11 57.8	11 59.7	11 25.1	51	4.0	111	8.8	171	13.5
52	11 58.0	11 60.0	11 25.3	52	4.1	112	8.9	172	13.6
53	11 58.3	12 .2	11 25.5	53	4.2	113	8.9	173	13.7
54	11 58.5	12 .5	11 25.8	54	4.3	114	9.0	174	13.8
55	11 58.8	12 .7	11 26.0	55	4.4	115	9.1	175	13.9
56	11 59.0	12 1.0	11 26.2	56	4.4	116	9.2	176	13.9
57	11 59.3	12 1.2	11 26.5	57	4.5	117	9.3	177	14.0
58	11 59.5	12 1.5	11 26.7	58	4.6	118	9.3	178	14.1
59	11 59.8	12 1.7	11 27.0	59	4.7	119	9.4	179	14.2
60	12 .0	12 2.0	11 27.2	60	4.8	120	9.5	180	14.3

0 h 48 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 .0	12 2.0	11 27.2	0	.0	60	4.9	120	9.7
1	12 .3	12 2.3	11 27.4	1	.1	61	4.9	121	9.8
2	12 .5	12 2.5	11 27.7	2	.2	62	5.0	122	9.9
3	12 .8	12 2.8	11 27.9	3	.2	63	5.1	123	9.9
4	12 1.0	12 3.0	11 28.2	4	.3	64	5.2	124	10.0
5	12 1.3	12 3.3	11 28.4	5	.4	65	5.3	125	10.1
6	12 1.5	12 3.5	11 28.6	6	.5	66	5.3	126	10.2
7	12 1.8	12 3.8	11 28.9	7	.6	67	5.4	127	10.3
8	12 2.0	12 4.0	11 29.1	8	.6	68	5.5	128	10.3
9	12 2.3	12 4.3	11 29.3	9	.7	69	5.6	129	10.4
10	12 2.5	12 4.5	11 29.6	10	.8	70	5.7	130	10.5
11	12 2.8	12 4.8	11 29.8	11	.9	71	5.7	131	10.6
12	12 3.0	12 5.0	11 30.1	12	1.0	72	5.8	132	10.7
13	12 3.3	12 5.3	11 30.3	13	1.1	73	5.9	133	10.8
14	12 3.5	12 5.5	11 30.5	14	1.1	74	6.0	134	10.8
15	12 3.8	12 5.8	11 30.8	15	1.2	75	6.1	135	10.9
16	12 4.0	12 6.0	11 31.0	16	1.3	76	6.1	136	11.0
17	12 4.3	12 6.3	11 31.3	17	1.4	77	6.2	137	11.1
18	12 4.5	12 6.5	11 31.5	18	1.5	78	6.3	138	11.2
19	12 4.8	12 6.8	11 31.7	19	1.5	79	6.4	139	11.2
20	12 5.0	12 7.0	11 32.0	20	1.6	80	6.5	140	11.3
21	12 5.3	12 7.3	11 32.2	21	1.7	81	6.5	141	11.4
22	12 5.5	12 7.5	11 32.4	22	1.8	82	6.6	142	11.5
23	12 5.8	12 7.8	11 32.7	23	1.9	83	6.7	143	11.6
24	12 6.0	12 8.0	11 32.9	24	1.9	84	6.8	144	11.6
25	12 6.3	12 8.3	11 33.2	25	2.0	85	6.9	145	11.7
26	12 6.5	12 8.5	11 33.4	26	2.1	86	7.0	146	11.8
27	12 6.8	12 8.8	11 33.6	27	2.2	87	7.0	147	11.9
28	12 7.0	12 9.0	11 33.9	28	2.3	88	7.1	148	12.0
29	12 7.3	12 9.3	11 34.1	29	2.3	89	7.2	149	12.0
30	12 7.5	12 9.5	11 34.4	30	2.4	90	7.3	150	12.1
31	12 7.8	12 9.8	11 34.6	31	2.5	91	7.4	151	12.2
32	12 8.0	12 10.0	11 34.8	32	2.6	92	7.4	152	12.3
33	12 8.3	12 10.3	11 35.1	33	2.7	93	7.5	153	12.4
34	12 8.5	12 10.5	11 35.3	34	2.7	94	7.6	154	12.4
35	12 8.8	12 10.8	11 35.6	35	2.8	95	7.7	155	12.5
36	12 9.0	12 11.0	11 35.8	36	2.9	96	7.8	156	12.6
37	12 9.3	12 11.3	11 36.0	37	3.0	97	7.8	157	12.7
38	12 9.5	12 11.5	11 36.3	38	3.1	98	7.9	158	12.8
39	12 9.8	12 11.8	11 36.5	39	3.2	99	8.0	159	12.9
40	12 10.0	12 12.0	11 36.7	40	3.2	100	8.1	160	12.9
41	12 10.3	12 12.3	11 37.0	41	3.3	101	8.2	161	13.0
42	12 10.5	12 12.5	11 37.2	42	3.4	102	8.2	162	13.1
43	12 10.8	12 12.8	11 37.5	43	3.5	103	8.3	163	13.2
44	12 11.0	12 13.0	11 37.7	44	3.6	104	8.4	164	13.3
45	12 11.3	12 13.3	11 37.9	45	3.6	105	8.5	165	13.3
46	12 11.5	12 13.5	11 38.2	46	3.7	106	8.6	166	13.4
47	12 11.8	12 13.8	11 38.4	47	3.8	107	8.6	167	13.5
48	12 12.0	12 14.0	11 38.7	48	3.9	108	8.7	168	13.6
49	12 12.3	12 14.3	11 38.9	49	4.0	109	8.8	169	13.7
50	12 12.5	12 14.5	11 39.1	50	4.0	110	8.9	170	13.7
51	12 12.8	12 14.8	11 39.4	51	4.1	111	9.0	171	13.8
52	12 13.0	12 15.0	11 39.6	52	4.2	112	9.1	172	13.9
53	12 13.3	12 15.3	11 39.8	53	4.3	113	9.1	173	14.0
54	12 13.5	12 15.5	11 40.1	54	4.4	114	9.2	174	14.1
55	12 13.8	12 15.8	11 40.3	55	4.4	115	9.3	175	14.1
56	12 14.0	12 16.0	11 40.6	56	4.5	116	9.4	176	14.2
57	12 14.3	12 16.3	11 40.8	57	4.6	117	9.5	177	14.3
58	12 14.5	12 16.5	11 41.0	58	4.7	118	9.5	178	14.4
59	12 14.8	12 16.8	11 41.3	59	4.8	119	9.6	179	14.5
60	12 15.0	12 17.0	11 41.5	60	4.9	120	9.7	180	14.6

0 h 49 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 15.0	12 17.0	11 41.5	0	.0	60	5.0	120	9.9
1	12 15.3	12 17.3	11 41.8	1	.1	61	5.0	121	10.0
2	12 15.5	12 17.5	11 42.0	2	.2	62	5.1	122	10.1
3	12 15.8	12 17.8	11 42.2	3	.2	63	5.2	123	10.1
4	12 16.0	12 18.0	11 42.5	4	.3	64	5.3	124	10.2
5	12 16.3	12 18.3	11 42.7	5	.4	65	5.4	125	10.3
6	12 16.5	12 18.5	11 42.9	6	.5	66	5.4	126	10.4
7	12 16.8	12 18.8	11 43.2	7	.6	67	5.5	127	10.5
8	12 17.0	12 19.0	11 43.4	8	.7	68	5.6	128	10.6
9	12 17.3	12 19.3	11 43.7	9	.7	69	5.7	129	10.6
10	12 17.5	12 19.5	11 43.9	10	.8	70	5.8	130	10.7
11	12 17.8	12 19.8	11 44.1	11	.9	71	5.9	131	10.8
12	12 18.0	12 20.1	11 44.4	12	1.0	72	5.9	132	10.9
13	12 18.3	12 20.3	11 44.6	13	1.1	73	6.0	133	11.0
14	12 18.5	12 20.6	11 44.9	14	1.2	74	6.1	134	11.1
15	12 18.8	12 20.8	11 45.1	15	1.2	75	6.2	135	11.1
16	12 19.0	12 21.1	11 45.3	16	1.3	76	6.3	136	11.2
17	12 19.3	12 21.3	11 45.6	17	1.4	77	6.4	137	11.3
18	12 19.5	12 21.6	11 45.8	18	1.5	78	6.4	138	11.4
19	12 19.8	12 21.8	11 46.1	19	1.6	79	6.5	139	11.5
20	12 20.0	12 22.1	11 46.3	20	1.7	80	6.6	140	11.6
21	12 20.3	12 22.3	11 46.5	21	1.7	81	6.7	141	11.6
22	12 20.5	12 22.6	11 46.8	22	1.8	82	6.8	142	11.7
23	12 20.8	12 22.8	11 47.0	23	1.9	83	6.8	143	11.8
24	12 21.0	12 23.1	11 47.2	24	2.0	84	6.9	144	11.9
25	12 21.3	12 23.3	11 47.5	25	2.1	85	7.0	145	12.0
26	12 21.5	12 23.6	11 47.7	26	2.1	86	7.1	146	12.0
27	12 21.8	12 23.8	11 48.0	27	2.2	87	7.2	147	12.1
28	12 22.0	12 24.1	11 48.2	28	2.3	88	7.3	148	12.2
29	12 22.3	12 24.3	11 48.4	29	2.4	89	7.3	149	12.3
30	12 22.5	12 24.6	11 48.7	30	2.5	90	7.4	150	12.4
31	12 22.8	12 24.8	11 48.9	31	2.6	91	7.5	151	12.5
32	12 23.0	12 25.1	11 49.2	32	2.6	92	7.6	152	12.5
33	12 23.3	12 25.3	11 49.4	33	2.7	93	7.7	153	12.6
34	12 23.5	12 25.6	11 49.6	34	2.8	94	7.8	154	12.7
35	12 23.8	12 25.8	11 49.9	35	2.9	95	7.8	155	12.8
36	12 24.0	12 26.1	11 50.1	36	3.0	96	7.9	156	12.9
37	12 24.3	12 26.3	11 50.3	37	3.1	97	8.0	157	13.0
38	12 24.5	12 26.6	11 50.6	38	3.1	98	8.1	158	13.0
39	12 24.8	12 26.8	11 50.8	39	3.2	99	8.2	159	13.1
40	12 25.0	12 27.1	11 51.1	40	3.3	100	8.3	160	13.2
41	12 25.3	12 27.3	11 51.3	41	3.4	101	8.3	161	13.3
42	12 25.5	12 27.6	11 51.5	42	3.5	102	8.4	162	13.4
43	12 25.8	12 27.8	11 51.8	43	3.5	103	8.5	163	13.4
44	12 26.0	12 28.1	11 52.0	44	3.6	104	8.6	164	13.5
45	12 26.3	12 28.3	11 52.3	45	3.7	105	8.7	165	13.6
46	12 26.5	12 28.6	11 52.5	46	3.8	106	8.7	166	13.7
47	12 26.8	12 28.8	11 52.7	47	3.9	107	8.8	167	13.8
48	12 27.0	12 29.1	11 53.0	48	4.0	108	8.9	168	13.9
49	12 27.3	12 29.3	11 53.2	49	4.0	109	9.0	169	13.9
50	12 27.5	12 29.6	11 53.4	50	4.1	110	9.1	170	14.0
51	12 27.8	12 29.8	11 53.7	51	4.2	111	9.2	171	14.1
52	12 28.0	12 30.1	11 53.9	52	4.3	112	9.2	172	14.2
53	12 28.3	12 30.3	11 54.2	53	4.4	113	9.3	173	14.3
54	12 28.5	12 30.6	11 54.4	54	4.5	114	9.4	174	14.4
55	12 28.8	12 30.8	11 54.6	55	4.5	115	9.5	175	14.4
56	12 29.0	12 31.1	11 54.9	56	4.6	116	9.6	176	14.5
57	12 29.3	12 31.3	11 55.1	57	4.7	117	9.7	177	14.6
58	12 29.5	12 31.6	11 55.4	58	4.8	118	9.7	178	14.7
59	12 29.8	12 31.8	11 55.6	59	4.9	119	9.8	179	14.8
60	12 30.0	12 32.1	11 55.8	60	5.0	120	9.9	180	14.9

0 h 50 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 30.0	12 32.1	11 55.8	0	.0	60	5.1	120	10.1
1	12 30.3	12 32.3	11 56.1	1	.1	61	5.1	121	10.2
2	12 30.5	12 32.6	11 56.3	2	.2	62	5.2	122	10.3
3	12 30.8	12 32.8	11 56.5	3	.3	63	5.3	123	10.4
4	12 31.0	12 33.1	11 56.8	4	.3	64	5.4	124	10.4
5	12 31.3	12 33.3	11 57.0	5	.4	65	5.5	125	10.5
6	12 31.5	12 33.6	11 57.3	6	.5	66	5.6	126	10.6
7	12 31.8	12 33.8	11 57.5	7	.6	67	5.6	127	10.7
8	12 32.0	12 34.1	11 57.7	8	.7	68	5.7	128	10.8
9	12 32.3	12 34.3	11 58.0	9	.8	69	5.8	129	10.9
10	12 32.5	12 34.6	11 58.2	10	.8	70	5.9	130	10.9
11	12 32.8	12 34.8	11 58.5	11	.9	71	6.0	131	11.0
12	12 33.0	12 35.1	11 58.7	12	1.0	72	6.1	132	11.1
13	12 33.3	12 35.3	11 58.9	13	1.1	73	6.1	133	11.2
14	12 33.5	12 35.6	11 59.2	14	1.2	74	6.2	134	11.3
15	12 33.8	12 35.8	11 59.4	15	1.3	75	6.3	135	11.4
16	12 34.0	12 36.1	11 59.7	16	1.3	76	6.4	136	11.4
17	12 34.3	12 36.3	11 59.9	17	1.4	77	6.5	137	11.5
18	12 34.5	12 36.6	12 .1	18	1.5	78	6.6	138	11.6
19	12 34.8	12 36.8	12 .4	19	1.6	79	6.6	139	11.7
20	12 35.0	12 37.1	12 .6	20	1.7	80	6.7	140	11.8
21	12 35.3	12 37.3	12 .8	21	1.8	81	6.8	141	11.9
22	12 35.5	12 37.6	12 1.1	22	1.9	82	6.9	142	12.0
23	12 35.8	12 37.8	12 1.3	23	1.9	83	7.0	143	12.0
24	12 36.0	12 38.1	12 1.6	24	2.0	84	7.1	144	12.1
25	12 36.3	12 38.4	12 1.8	25	2.1	85	7.2	145	12.2
26	12 36.5	12 38.6	12 2.0	26	2.2	86	7.2	146	12.3
27	12 36.8	12 38.9	12 2.3	27	2.3	87	7.3	147	12.4
28	12 37.0	12 39.1	12 2.5	28	2.4	88	7.4	148	12.5
29	12 37.3	12 39.4	12 2.8	29	2.4	89	7.5	149	12.5
30	12 37.5	12 39.6	12 3.0	30	2.5	90	7.6	150	12.6
31	12 37.8	12 39.9	12 3.2	31	2.6	91	7.7	151	12.7
32	12 38.0	12 40.1	12 3.5	32	2.7	92	7.7	152	12.8
33	12 38.3	12 40.4	12 3.7	33	2.8	93	7.8	153	12.9
34	12 38.5	12 40.6	12 3.9	34	2.9	94	7.9	154	13.0
35	12 38.8	12 40.9	12 4.2	35	2.9	95	8.0	155	13.0
36	12 39.0	12 41.1	12 4.4	36	3.0	96	8.1	156	13.1
37	12 39.3	12 41.4	12 4.7	37	3.1	97	8.2	157	13.2
38	12 39.5	12 41.6	12 4.9	38	3.2	98	8.2	158	13.3
39	12 39.8	12 41.9	12 5.1	39	3.3	99	8.3	159	13.4
40	12 40.0	12 42.1	12 5.4	40	3.4	100	8.4	160	13.5
41	12 40.3	12 42.4	12 5.6	41	3.5	101	8.5	161	13.6
42	12 40.5	12 42.6	12 5.9	42	3.5	102	8.6	162	13.6
43	12 40.8	12 42.9	12 6.1	43	3.6	103	8.7	163	13.7
44	12 41.0	12 43.1	12 6.3	44	3.7	104	8.8	164	13.8
45	12 41.3	12 43.4	12 6.6	45	3.8	105	8.8	165	13.9
46	12 41.5	12 43.6	12 6.8	46	3.9	106	8.9	166	14.0
47	12 41.8	12 43.9	12 7.0	47	4.0	107	9.0	167	14.1
48	12 42.0	12 44.1	12 7.3	48	4.0	108	9.1	168	14.1
49	12 42.3	12 44.4	12 7.5	49	4.1	109	9.2	169	14.2
50	12 42.5	12 44.6	12 7.8	50	4.2	110	9.3	170	14.3
51	12 42.8	12 44.9	12 8.0	51	4.3	111	9.3	171	14.4
52	12 43.0	12 45.1	12 8.2	52	4.4	112	9.4	172	14.5
53	12 43.3	12 45.4	12 8.5	53	4.5	113	9.5	173	14.6
54	12 43.5	12 45.6	12 8.7	54	4.5	114	9.6	174	14.6
55	12 43.8	12 45.9	12 9.0	55	4.6	115	9.7	175	14.7
56	12 44.0	12 46.1	12 9.2	56	4.7	116	9.8	176	14.8
57	12 44.3	12 46.4	12 9.4	57	4.8	117	9.8	177	14.9
58	12 44.5	12 46.6	12 9.7	58	4.9	118	9.9	178	15.0
59	12 44.8	12 46.9	12 9.9	59	5.0	119	10.0	179	15.1
60	12 45.0	12 47.1	12 10.2	60	5.1	120	10.1	180	15.2

0 h 51 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	12 45.0	12 47.1	12 10.2	0	.0	60	5.2	120	10.3
1	12 45.3	12 47.4	12 10.4	1	.1	61	5.2	121	10.4
2	12 45.5	12 47.6	12 10.6	2	.2	62	5.3	122	10.5
3	12 45.8	12 47.9	12 10.9	3	.3	63	5.4	123	10.6
4	12 46.0	12 48.1	12 11.1	4	.3	64	5.5	124	10.6
5	12 46.3	12 48.4	12 11.3	5	.4	65	5.6	125	10.7
6	12 46.5	12 48.6	12 11.6	6	.5	66	5.7	126	10.8
7	12 46.8	12 48.9	12 11.8	7	.6	67	5.8	127	10.9
8	12 47.0	12 49.1	12 12.1	8	.7	68	5.8	128	11.0
9	12 47.3	12 49.4	12 12.3	9	.8	69	5.9	129	11.1
10	12 47.5	12 49.6	12 12.5	10	.9	70	6.0	130	11.2
11	12 47.8	12 49.9	12 12.8	11	.9	71	6.1	131	11.2
12	12 48.0	12 50.1	12 13.0	12	1.0	72	6.2	132	11.3
13	12 48.3	12 50.4	12 13.3	13	1.1	73	6.3	133	11.4
14	12 48.5	12 50.6	12 13.5	14	1.2	74	6.4	134	11.5
15	12 48.8	12 50.9	12 13.7	15	1.3	75	6.4	135	11.6
16	12 49.0	12 51.1	12 14.0	16	1.4	76	6.5	136	11.7
17	12 49.3	12 51.4	12 14.2	17	1.5	77	6.6	137	11.8
18	12 49.5	12 51.6	12 14.4	18	1.5	78	6.7	138	11.8
19	12 49.8	12 51.9	12 14.7	19	1.6	79	6.8	139	11.9
20	12 50.0	12 52.1	12 14.9	20	1.7	80	6.9	140	12.0
21	12 50.3	12 52.4	12 15.2	21	1.8	81	7.0	141	12.1
22	12 50.5	12 52.6	12 15.4	22	1.9	82	7.0	142	12.2
23	12 50.8	12 52.9	12 15.6	23	2.0	83	7.1	143	12.3
24	12 51.0	12 53.1	12 15.9	24	2.1	84	7.2	144	12.4
25	12 51.3	12 53.4	12 16.1	25	2.1	85	7.3	145	12.4
26	12 51.5	12 53.6	12 16.4	26	2.2	86	7.4	146	12.5
27	12 51.8	12 53.9	12 16.6	27	2.3	87	7.5	147	12.6
28	12 52.0	12 54.1	12 16.8	28	2.4	88	7.6	148	12.7
29	12 52.3	12 54.4	12 17.1	29	2.5	89	7.6	149	12.8
30	12 52.5	12 54.6	12 17.3	30	2.6	90	7.7	150	12.9
31	12 52.8	12 54.9	12 17.5	31	2.7	91	7.8	151	13.0
32	12 53.0	12 55.1	12 17.8	32	2.7	92	7.9	152	13.0
33	12 53.3	12 55.4	12 18.0	33	2.8	93	8.0	153	13.1
34	12 53.5	12 55.6	12 18.3	34	2.9	94	8.1	154	13.2
35	12 53.8	12 55.9	12 18.5	35	3.0	95	8.2	155	13.3
36	12 54.0	12 56.2	12 18.7	36	3.1	96	8.2	156	13.4
37	12 54.3	12 56.4	12 19.0	37	3.2	97	8.3	157	13.5
38	12 54.5	12 56.7	12 19.2	38	3.3	98	8.4	158	13.6
39	12 54.8	12 56.9	12 19.5	39	3.3	99	8.5	159	13.6
40	12 55.0	12 57.2	12 19.7	40	3.4	100	8.6	160	13.7
41	12 55.3	12 57.4	12 19.9	41	3.5	101	8.7	161	13.8
42	12 55.5	12 57.7	12 20.2	42	3.6	102	8.8	162	13.9
43	12 55.8	12 57.9	12 20.4	43	3.7	103	8.8	163	14.0
44	12 56.0	12 58.2	12 20.6	44	3.8	104	8.9	164	14.1
45	12 56.3	12 58.4	12 20.9	45	3.9	105	9.0	165	14.2
46	12 56.5	12 58.7	12 21.1	46	3.9	106	9.1	166	14.2
47	12 56.8	12 58.9	12 21.4	47	4.0	107	9.2	167	14.3
48	12 57.0	12 59.2	12 21.6	48	4.1	108	9.3	168	14.4
49	12 57.3	12 59.4	12 21.8	49	4.2	109	9.4	169	14.5
50	12 57.5	12 59.7	12 22.1	50	4.3	110	9.4	170	14.6
51	12 57.8	12 59.9	12 22.3	51	4.4	111	9.5	171	14.7
52	12 58.0	13 .2	12 22.6	52	4.5	112	9.6	172	14.8
53	12 58.3	13 .4	12 22.8	53	4.5	113	9.7	173	14.8
54	12 58.5	13 .7	12 23.0	54	4.6	114	9.8	174	14.9
55	12 58.8	13 .9	12 23.3	55	4.7	115	9.9	175	15.0
56	12 59.0	13 1.2	12 23.5	56	4.8	116	10.0	176	15.1
57	12 59.3	13 1.4	12 23.8	57	4.9	117	10.0	177	15.2
58	12 59.5	13 1.7	12 24.0	58	5.0	118	10.1	178	15.3
59	12 59.8	13 1.9	12 24.2	59	5.1	119	10.2	179	15.4
60	13 .0	13 2.2	12 24.5	60	5.2	120	10.3	180	15.5

0 h 52 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	13	.0	13	2.2	12	24.5	0	.0	60	5.3	120	10.5
1	13	.3	13	2.4	12	24.7	1	.1	61	5.3	121	10.6
2	13	.5	13	2.7	12	24.9	2	.2	62	5.4	122	10.7
3	13	.8	13	2.9	12	25.2	3	.3	63	5.5	123	10.8
4	13	1.0	13	3.2	12	25.4	4	.4	64	5.6	124	10.9
5	13	1.3	13	3.4	12	25.7	5	.4	65	5.7	125	10.9
6	13	1.5	13	3.7	12	25.9	6	.5	66	5.8	126	11.0
7	13	1.8	13	3.9	12	26.1	7	.6	67	5.9	127	11.1
8	13	2.0	13	4.2	12	26.4	8	.7	68	6.0	128	11.2
9	13	2.3	13	4.4	12	26.6	9	.8	69	6.0	129	11.3
10	13	2.5	13	4.7	12	26.9	10	.9	70	6.1	130	11.4
11	13	2.8	13	4.9	12	27.1	11	1.0	71	6.2	131	11.5
12	13	3.0	13	5.2	12	27.3	12	1.1	72	6.3	132	11.6
13	13	3.3	13	5.4	12	27.6	13	1.1	73	6.4	133	11.6
14	13	3.5	13	5.7	12	27.8	14	1.2	74	6.5	134	11.7
15	13	3.8	13	5.9	12	28.0	15	1.3	75	6.6	135	11.8
16	13	4.0	13	6.2	12	28.3	16	1.4	76	6.7	136	11.9
17	13	4.3	13	6.4	12	28.5	17	1.5	77	6.7	137	12.0
18	13	4.5	13	6.7	12	28.8	18	1.6	78	6.8	138	12.1
19	13	4.8	13	6.9	12	29.0	19	1.7	79	6.9	139	12.2
20	13	5.0	13	7.2	12	29.2	20	1.8	80	7.0	140	12.3
21	13	5.3	13	7.4	12	29.5	21	1.8	81	7.1	141	12.3
22	13	5.5	13	7.7	12	29.7	22	1.9	82	7.2	142	12.4
23	13	5.8	13	7.9	12	30.0	23	2.0	83	7.3	143	12.5
24	13	6.0	13	8.2	12	30.2	24	2.1	84	7.4	144	12.6
25	13	6.3	13	8.4	12	30.4	25	2.2	85	7.4	145	12.7
26	13	6.5	13	8.7	12	30.7	26	2.3	86	7.5	146	12.8
27	13	6.8	13	8.9	12	30.9	27	2.4	87	7.6	147	12.9
28	13	7.0	13	9.2	12	31.1	28	2.5	88	7.7	148	13.0
29	13	7.3	13	9.4	12	31.4	29	2.5	89	7.8	149	13.0
30	13	7.5	13	9.7	12	31.6	30	2.6	90	7.9	150	13.1
31	13	7.8	13	9.9	12	31.9	31	2.7	91	8.0	151	13.2
32	13	8.0	13	10.2	12	32.1	32	2.8	92	8.1	152	13.3
33	13	8.3	13	10.4	12	32.3	33	2.9	93	8.1	153	13.4
34	13	8.5	13	10.7	12	32.6	34	3.0	94	8.2	154	13.5
35	13	8.8	13	10.9	12	32.8	35	3.1	95	8.3	155	13.6
36	13	9.0	13	11.2	12	33.1	36	3.2	96	8.4	156	13.7
37	13	9.3	13	11.4	12	33.3	37	3.2	97	8.5	157	13.7
38	13	9.5	13	11.7	12	33.5	38	3.3	98	8.6	158	13.8
39	13	9.8	13	11.9	12	33.8	39	3.4	99	8.7	159	13.9
40	13	10.0	13	12.2	12	34.0	40	3.5	100	8.8	160	14.0
41	13	10.3	13	12.4	12	34.2	41	3.6	101	8.8	161	14.1
42	13	10.5	13	12.7	12	34.5	42	3.7	102	8.9	162	14.2
43	13	10.8	13	12.9	12	34.7	43	3.8	103	9.0	163	14.3
44	13	11.0	13	13.2	12	35.0	44	3.9	104	9.1	164	14.4
45	13	11.3	13	13.4	12	35.2	45	3.9	105	9.2	165	14.4
46	13	11.5	13	13.7	12	35.4	46	4.0	106	9.3	166	14.5
47	13	11.8	13	13.9	12	35.7	47	4.1	107	9.4	167	14.6
48	13	12.0	13	14.2	12	35.9	48	4.2	108	9.5	168	14.7
49	13	12.3	13	14.5	12	36.2	49	4.3	109	9.5	169	14.8
50	13	12.5	13	14.7	12	36.4	50	4.4	110	9.6	170	14.9
51	13	12.8	13	15.0	12	36.6	51	4.5	111	9.7	171	15.0
52	13	13.0	13	15.2	12	36.9	52	4.6	112	9.8	172	15.1
53	13	13.3	13	15.5	12	37.1	53	4.6	113	9.9	173	15.1
54	13	13.5	13	15.7	12	37.4	54	4.7	114	10.0	174	15.2
55	13	13.8	13	16.0	12	37.6	55	4.8	115	10.1	175	15.3
56	13	14.0	13	16.2	12	37.8	56	4.9	116	10.2	176	15.4
57	13	14.3	13	16.5	12	38.1	57	5.0	117	10.2	177	15.5
58	13	14.5	13	16.7	12	38.3	58	5.1	118	10.3	178	15.6
59	13	14.8	13	17.0	12	38.5	59	5.2	119	10.4	179	15.7
60	13	15.0	13	17.2	12	38.8	60	5.3	120	10.5	180	15.8

0 h 53 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	13	15.0	13	17.2	12	38.8	0	.0	60	5.4	120	10.7
1	13	15.3	13	17.5	12	39.0	1	.1	61	5.4	121	10.8
2	13	15.5	13	17.7	12	39.3	2	.2	62	5.5	122	10.9
3	13	15.8	13	18.0	12	39.5	3	.3	63	5.6	123	11.0
4	13	16.0	13	18.2	12	39.7	4	.4	64	5.7	124	11.1
5	13	16.3	13	18.5	12	40.0	5	.4	65	5.8	125	11.1
6	13	16.5	13	18.7	12	40.2	6	.5	66	5.9	126	11.2
7	13	16.8	13	19.0	12	40.5	7	.6	67	6.0	127	11.3
8	13	17.0	13	19.2	12	40.7	8	.7	68	6.1	128	11.4
9	13	17.3	13	19.5	12	40.9	9	.8	69	6.2	129	11.5
10	13	17.5	13	19.7	12	41.2	10	.9	70	6.2	130	11.6
11	13	17.8	13	20.0	12	41.4	11	1.0	71	6.3	131	11.7
12	13	18.0	13	20.2	12	41.6	12	1.1	72	6.4	132	11.8
13	13	18.3	13	20.5	12	41.9	13	1.2	73	6.5	133	11.9
14	13	18.5	13	20.7	12	42.1	14	1.2	74	6.6	134	11.9
15	13	18.8	13	21.0	12	42.4	15	1.3	75	6.7	135	12.0
16	13	19.0	13	21.2	12	42.6	16	1.4	76	6.8	136	12.1
17	13	19.3	13	21.5	12	42.8	17	1.5	77	6.9	137	12.2
18	13	19.5	13	21.7	12	43.1	18	1.6	78	7.0	138	12.3
19	13	19.8	13	22.0	12	43.3	19	1.7	79	7.0	139	12.4
20	13	20.0	13	22.2	12	43.6	20	1.8	80	7.1	140	12.5
21	13	20.3	13	22.5	12	43.8	21	1.9	81	7.2	141	12.6
22	13	20.5	13	22.7	12	44.0	22	2.0	82	7.3	142	12.7
23	13	20.8	13	23.0	12	44.3	23	2.1	83	7.4	143	12.8
24	13	21.0	13	23.2	12	44.5	24	2.1	84	7.5	144	12.8
25	13	21.3	13	23.5	12	44.7	25	2.2	85	7.6	145	12.9
26	13	21.5	13	23.7	12	45.0	26	2.3	86	7.7	146	13.0
27	13	21.8	13	24.0	12	45.2	27	2.4	87	7.8	147	13.1
28	13	22.0	13	24.2	12	45.5	28	2.5	88	7.8	148	13.2
29	13	22.3	13	24.5	12	45.7	29	2.6	89	7.9	149	13.3
30	13	22.5	13	24.7	12	45.9	30	2.7	90	8.0	150	13.4
31	13	22.8	13	25.0	12	46.2	31	2.8	91	8.1	151	13.5
32	13	23.0	13	25.2	12	46.4	32	2.9	92	8.2	152	13.6
33	13	23.3	13	25.5	12	46.7	33	2.9	93	8.3	153	13.6
34	13	23.5	13	25.7	12	46.9	34	3.0	94	8.4	154	13.7
35	13	23.8	13	26.0	12	47.1	35	3.1	95	8.5	155	13.8
36	13	24.0	13	26.2	12	47.4	36	3.2	96	8.6	156	13.9
37	13	24.3	13	26.5	12	47.6	37	3.3	97	8.6	157	14.0
38	13	24.5	13	26.7	12	47.9	38	3.4	98	8.7	158	14.1
39	13	24.8	13	27.0	12	48.1	39	3.5	99	8.8	159	14.2
40	13	25.0	13	27.2	12	48.3	40	3.6	100	8.9	160	14.3
41	13	25.3	13	27.5	12	48.6	41	3.7	101	9.0	161	14.4
42	13	25.5	13	27.7	12	48.8	42	3.7	102	9.1	162	14.4
43	13	25.8	13	28.0	12	49.0	43	3.8	103	9.2	163	14.5
44	13	26.0	13	28.2	12	49.3	44	3.9	104	9.3	164	14.6
45	13	26.3	13	28.5	12	49.5	45	4.0	105	9.4	165	14.7
46	13	26.5	13	28.7	12	49.8	46	4.1	106	9.5	166	14.8
47	13	26.8	13	29.0	12	50.0	47	4.2	107	9.5	167	14.9
48	13	27.0	13	29.2	12	50.2	48	4.3	108	9.6	168	15.0
49	13	27.3	13	29.5	12	50.5	49	4.4	109	9.7	169	15.1
50	13	27.5	13	29.7	12	50.7	50	4.5	110	9.8	170	15.2
51	13	27.8	13	30.0	12	51.0	51	4.5	111	9.9	171	15.2
52	13	28.0	13	30.2	12	51.2	52	4.6	112	10.0	172	15.3
53	13	28.3	13	30.5	12	51.4	53	4.7	113	10.1	173	15.4
54	13	28.5	13	30.7	12	51.7	54	4.8	114	10.2	174	15.5
55	13	28.8	13	31.0	12	51.9	55	4.9	115	10.3	175	15.6
56	13	29.0	13	31.2	12	52.1	56	5.0	116	10.3	176	15.7
57	13	29.3	13	31.5	12	52.4	57	5.1	117	10.4	177	15.8
58	13	29.5	13	31.7	12	52.6	58	5.2	118	10.5	178	15.9
59	13	29.8	13	32.0	12	52.9	59	5.3	119	10.6	179	16.0
60	13	30.0	13	32.3	12	53.1	60	5.4	120	10.7	180	16.1

0 h 54 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 30.0	13 32.3	12 53.1	0	.0	60	5.5	120	10.9
1	13 30.3	13 32.5	12 53.3	1	.1	61	5.5	121	11.0
2	13 30.5	13 32.8	12 53.6	2	.2	62	5.6	122	11.1
3	13 30.8	13 33.0	12 53.8	3	.3	63	5.7	123	11.2
4	13 31.0	13 33.3	12 54.1	4	.4	64	5.8	124	11.3
5	13 31.3	13 33.5	12 54.3	5	.5	65	5.9	125	11.4
6	13 31.5	13 33.8	12 54.5	6	.5	66	6.0	126	11.4
7	13 31.8	13 34.0	12 54.8	7	.6	67	6.1	127	11.5
8	13 32.0	13 34.3	12 55.0	8	.7	68	6.2	128	11.6
9	13 32.3	13 34.5	12 55.2	9	.8	69	6.3	129	11.7
10	13 32.5	13 34.8	12 55.5	10	.9	70	6.4	130	11.8
11	13 32.8	13 35.0	12 55.7	11	1.0	71	6.4	131	11.9
12	13 33.0	13 35.3	12 56.0	12	1.1	72	6.5	132	12.0
13	13 33.3	13 35.5	12 56.2	13	1.2	73	6.6	133	12.1
14	13 33.5	13 35.8	12 56.4	14	1.3	74	6.7	134	12.2
15	13 33.8	13 36.0	12 56.7	15	1.4	75	6.8	135	12.3
16	13 34.0	13 36.3	12 56.9	16	1.5	76	6.9	136	12.4
17	13 34.3	13 36.5	12 57.2	17	1.5	77	7.0	137	12.4
18	13 34.5	13 36.8	12 57.4	18	1.6	78	7.1	138	12.5
19	13 34.8	13 37.0	12 57.6	19	1.7	79	7.2	139	12.6
20	13 35.0	13 37.3	12 57.9	20	1.8	80	7.3	140	12.7
21	13 35.3	13 37.5	12 58.1	21	1.9	81	7.4	141	12.8
22	13 35.5	13 37.8	12 58.3	22	2.0	82	7.4	142	12.9
23	13 35.8	13 38.0	12 58.6	23	2.1	83	7.5	143	13.0
24	13 36.0	13 38.3	12 58.8	24	2.2	84	7.6	144	13.1
25	13 36.3	13 38.5	12 59.1	25	2.3	85	7.7	145	13.2
26	13 36.5	13 38.8	12 59.3	26	2.4	86	7.8	146	13.3
27	13 36.8	13 39.0	12 59.5	27	2.5	87	7.9	147	13.4
28	13 37.0	13 39.3	12 59.8	28	2.5	88	8.0	148	13.4
29	13 37.3	13 39.5	13 .0	29	2.6	89	8.1	149	13.5
30	13 37.5	13 39.8	13 .3	30	2.7	90	8.2	150	13.6
31	13 37.8	13 40.0	13 .5	31	2.8	91	8.3	151	13.7
32	13 38.0	13 40.3	13 .7	32	2.9	92	8.4	152	13.8
33	13 38.3	13 40.5	13 1.0	33	3.0	93	8.4	153	13.9
34	13 38.5	13 40.8	13 1.2	34	3.1	94	8.5	154	14.0
35	13 38.8	13 41.0	13 1.5	35	3.2	95	8.6	155	14.1
36	13 39.0	13 41.3	13 1.7	36	3.3	96	8.7	156	14.2
37	13 39.3	13 41.5	13 1.9	37	3.4	97	8.8	157	14.3
38	13 39.5	13 41.8	13 2.2	38	3.5	98	8.9	158	14.4
39	13 39.8	13 42.0	13 2.4	39	3.5	99	9.0	159	14.4
40	13 40.0	13 42.3	13 2.6	40	3.6	100	9.1	160	14.5
41	13 40.3	13 42.5	13 2.9	41	3.7	101	9.2	161	14.6
42	13 40.5	13 42.8	13 3.1	42	3.8	102	9.3	162	14.7
43	13 40.8	13 43.0	13 3.4	43	3.9	103	9.4	163	14.8
44	13 41.0	13 43.3	13 3.6	44	4.0	104	9.4	164	14.9
45	13 41.3	13 43.5	13 3.8	45	4.1	105	9.5	165	15.0
46	13 41.5	13 43.8	13 4.1	46	4.2	106	9.6	166	15.1
47	13 41.8	13 44.0	13 4.3	47	4.3	107	9.7	167	15.2
48	13 42.0	13 44.3	13 4.6	48	4.4	108	9.8	168	15.3
49	13 42.3	13 44.5	13 4.8	49	4.5	109	9.9	169	15.4
50	13 42.5	13 44.8	13 5.0	50	4.5	110	10.0	170	15.4
51	13 42.8	13 45.0	13 5.3	51	4.6	111	10.1	171	15.5
52	13 43.0	13 45.3	13 5.5	52	4.7	112	10.2	172	15.6
53	13 43.3	13 45.5	13 5.7	53	4.8	113	10.3	173	15.7
54	13 43.5	13 45.8	13 6.0	54	4.9	114	10.4	174	15.8
55	13 43.8	13 46.0	13 6.2	55	5.0	115	10.4	175	15.9
56	13 44.0	13 46.3	13 6.5	56	5.1	116	10.5	176	16.0
57	13 44.3	13 46.5	13 6.7	57	5.2	117	10.6	177	16.1
58	13 44.5	13 46.8	13 6.9	58	5.3	118	10.7	178	16.2
59	13 44.8	13 47.0	13 7.2	59	5.4	119	10.8	179	16.3
60	13 45.0	13 47.3	13 7.4	60	5.5	120	10.9	180	16.4

0 h 55 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	13 45.0	13 47.3	13 7.4	0	.0	60	5.6	120	11.1
1	13 45.3	13 47.5	13 7.7	1	.1	61	5.6	121	11.2
2	13 45.5	13 47.8	13 7.9	2	.2	62	5.7	122	11.3
3	13 45.8	13 48.0	13 8.1	3	.3	63	5.8	123	11.4
4	13 46.0	13 48.3	13 8.4	4	.4	64	5.9	124	11.5
5	13 46.3	13 48.5	13 8.6	5	.5	65	6.0	125	11.6
6	13 46.5	13 48.8	13 8.8	6	.6	66	6.1	126	11.7
7	13 46.8	13 49.0	13 9.1	7	.6	67	6.2	127	11.7
8	13 47.0	13 49.3	13 9.3	8	.7	68	6.3	128	11.8
9	13 47.3	13 49.5	13 9.6	9	.8	69	6.4	129	11.9
10	13 47.5	13 49.8	13 9.8	10	.9	70	6.5	130	12.0
11	13 47.8	13 50.0	13 10.0	11	1.0	71	6.6	131	12.1
12	13 48.0	13 50.3	13 10.3	12	1.1	72	6.7	132	12.2
13	13 48.3	13 50.6	13 10.5	13	1.2	73	6.8	133	12.3
14	13 48.5	13 50.8	13 10.8	14	1.3	74	6.8	134	12.4
15	13 48.8	13 51.1	13 11.0	15	1.4	75	6.9	135	12.5
16	13 49.0	13 51.3	13 11.2	16	1.5	76	7.0	136	12.6
17	13 49.3	13 51.6	13 11.5	17	1.6	77	7.1	137	12.7
18	13 49.5	13 51.8	13 11.7	18	1.7	78	7.2	138	12.8
19	13 49.8	13 52.1	13 12.0	19	1.8	79	7.3	139	12.9
20	13 50.0	13 52.3	13 12.2	20	1.9	80	7.4	140	13.0
21	13 50.3	13 52.6	13 12.4	21	1.9	81	7.5	141	13.0
22	13 50.5	13 52.8	13 12.7	22	2.0	82	7.6	142	13.1
23	13 50.8	13 53.1	13 12.9	23	2.1	83	7.7	143	13.2
24	13 51.0	13 53.3	13 13.1	24	2.2	84	7.8	144	13.3
25	13 51.3	13 53.6	13 13.4	25	2.3	85	7.9	145	13.4
26	13 51.5	13 53.8	13 13.6	26	2.4	86	8.0	146	13.5
27	13 51.8	13 54.1	13 13.9	27	2.5	87	8.0	147	13.6
28	13 52.0	13 54.3	13 14.1	28	2.6	88	8.1	148	13.7
29	13 52.3	13 54.6	13 14.3	29	2.7	89	8.2	149	13.8
30	13 52.5	13 54.8	13 14.6	30	2.8	90	8.3	150	13.9
31	13 52.8	13 55.1	13 14.8	31	2.9	91	8.4	151	14.0
32	13 53.0	13 55.3	13 15.1	32	3.0	92	8.5	152	14.1
33	13 53.3	13 55.6	13 15.3	33	3.1	93	8.6	153	14.2
34	13 53.5	13 55.8	13 15.5	34	3.1	94	8.7	154	14.2
35	13 53.8	13 56.1	13 15.8	35	3.2	95	8.8	155	14.3
36	13 54.0	13 56.3	13 16.0	36	3.3	96	8.9	156	14.4
37	13 54.3	13 56.6	13 16.2	37	3.4	97	9.0	157	14.5
38	13 54.5	13 56.8	13 16.5	38	3.5	98	9.1	158	14.6
39	13 54.8	13 57.1	13 16.7	39	3.6	99	9.2	159	14.7
40	13 55.0	13 57.3	13 17.0	40	3.7	100	9.3	160	14.8
41	13 55.3	13 57.6	13 17.2	41	3.8	101	9.3	161	14.9
42	13 55.5	13 57.8	13 17.4	42	3.9	102	9.4	162	15.0
43	13 55.8	13 58.1	13 17.7	43	4.0	103	9.5	163	15.1
44	13 56.0	13 58.3	13 17.9	44	4.1	104	9.6	164	15.2
45	13 56.3	13 58.6	13 18.2	45	4.2	105	9.7	165	15.3
46	13 56.5	13 58.8	13 18.4	46	4.3	106	9.8	166	15.4
47	13 56.8	13 59.1	13 18.6	47	4.3	107	9.9	167	15.4
48	13 57.0	13 59.3	13 18.9	48	4.4	108	10.0	168	15.5
49	13 57.3	13 59.6	13 19.1	49	4.5	109	10.1	169	15.6
50	13 57.5	13 59.8	13 19.3	50	4.6	110	10.2	170	15.7
51	13 57.8	14 .1	13 19.6	51	4.7	111	10.3	171	15.8
52	13 58.0	14 .3	13 19.8	52	4.8	112	10.4	172	15.9
53	13 58.3	14 .6	13 20.1	53	4.9	113	10.5	173	16.0
54	13 58.5	14 .8	13 20.3	54	5.0	114	10.5	174	16.1
55	13 58.8	14 1.1	13 20.5	55	5.1	115	10.6	175	16.2
56	13 59.0	14 1.3	13 20.8	56	5.2	116	10.7	176	16.3
57	13 59.3	14 1.6	13 21.0	57	5.3	117	10.8	177	16.4
58	13 59.5	14 1.8	13 21.3	58	5.4	118	10.9	178	16.5
59	13 59.8	14 2.1	13 21.5	59	5.5	119	11.0	179	16.6
60	14 .0	14 2.3	13 21.7	60	5.6	120	11.1	180	16.7

0 h 56 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	14	.0	14	2.3	13	21.7	0	.0	60	5.7	120	11.3
1	14	.3	14	2.6	13	22.0	1	.1	61	5.7	121	11.4
2	14	.5	14	2.8	13	22.2	2	.2	62	5.8	122	11.5
3	14	.8	14	3.1	13	22.4	3	.3	63	5.9	123	11.6
4	14	1.0	14	3.3	13	22.7	4	.4	64	6.0	124	11.7
5	14	1.3	14	3.6	13	22.9	5	.5	65	6.1	125	11.8
6	14	1.5	14	3.8	13	23.2	6	.6	66	6.2	126	11.9
7	14	1.8	14	4.1	13	23.4	7	.7	67	6.3	127	12.0
8	14	2.0	14	4.3	13	23.6	8	.8	68	6.4	128	12.1
9	14	2.3	14	4.6	13	23.9	9	.8	69	6.5	129	12.1
10	14	2.5	14	4.8	13	24.1	10	.9	70	6.6	130	12.2
11	14	2.8	14	5.1	13	24.4	11	1.0	71	6.7	131	12.3
12	14	3.0	14	5.3	13	24.6	12	1.1	72	6.8	132	12.4
13	14	3.3	14	5.6	13	24.8	13	1.2	73	6.9	133	12.5
14	14	3.5	14	5.8	13	25.1	14	1.3	74	7.0	134	12.6
15	14	3.8	14	6.1	13	25.3	15	1.4	75	7.1	135	12.7
16	14	4.0	14	6.3	13	25.6	16	1.5	76	7.2	136	12.8
17	14	4.3	14	6.6	13	25.8	17	1.6	77	7.3	137	12.9
18	14	4.5	14	6.8	13	26.0	18	1.7	78	7.3	138	13.0
19	14	4.8	14	7.1	13	26.3	19	1.8	79	7.4	139	13.1
20	14	5.0	14	7.3	13	26.5	20	1.9	80	7.5	140	13.2
21	14	5.3	14	7.6	13	26.7	21	2.0	81	7.6	141	13.3
22	14	5.5	14	7.8	13	27.0	22	2.1	82	7.7	142	13.4
23	14	5.8	14	8.1	13	27.2	23	2.2	83	7.8	143	13.5
24	14	6.0	14	8.4	13	27.5	24	2.3	84	7.9	144	13.6
25	14	6.3	14	8.6	13	27.7	25	2.4	85	8.0	145	13.7
26	14	6.5	14	8.9	13	27.9	26	2.4	86	8.1	146	13.7
27	14	6.8	14	9.1	13	28.2	27	2.5	87	8.2	147	13.8
28	14	7.0	14	9.4	13	28.4	28	2.6	88	8.3	148	13.9
29	14	7.3	14	9.6	13	28.7	29	2.7	89	8.4	149	14.0
30	14	7.5	14	9.9	13	28.9	30	2.8	90	8.5	150	14.1
31	14	7.8	14	10.1	13	29.1	31	2.9	91	8.6	151	14.2
32	14	8.0	14	10.4	13	29.4	32	3.0	92	8.7	152	14.3
33	14	8.3	14	10.6	13	29.6	33	3.1	93	8.8	153	14.4
34	14	8.5	14	10.9	13	29.8	34	3.2	94	8.9	154	14.5
35	14	8.8	14	11.1	13	30.1	35	3.3	95	8.9	155	14.6
36	14	9.0	14	11.4	13	30.3	36	3.4	96	9.0	156	14.7
37	14	9.3	14	11.6	13	30.6	37	3.5	97	9.1	157	14.8
38	14	9.5	14	11.9	13	30.8	38	3.6	98	9.2	158	14.9
39	14	9.8	14	12.1	13	31.0	39	3.7	99	9.3	159	15.0
40	14	10.0	14	12.4	13	31.3	40	3.8	100	9.4	160	15.1
41	14	10.3	14	12.6	13	31.5	41	3.9	101	9.5	161	15.2
42	14	10.5	14	12.9	13	31.8	42	4.0	102	9.6	162	15.3
43	14	10.8	14	13.1	13	32.0	43	4.0	103	9.7	163	15.3
44	14	11.0	14	13.4	13	32.2	44	4.1	104	9.8	164	15.4
45	14	11.3	14	13.6	13	32.5	45	4.2	105	9.9	165	15.5
46	14	11.5	14	13.9	13	32.7	46	4.3	106	10.0	166	15.6
47	14	11.8	14	14.1	13	32.9	47	4.4	107	10.1	167	15.7
48	14	12.0	14	14.4	13	33.2	48	4.5	108	10.2	168	15.8
49	14	12.3	14	14.6	13	33.4	49	4.6	109	10.3	169	15.9
50	14	12.5	14	14.9	13	33.7	50	4.7	110	10.4	170	16.0
51	14	12.8	14	15.1	13	33.9	51	4.8	111	10.5	171	16.1
52	14	13.0	14	15.4	13	34.1	52	4.9	112	10.5	172	16.2
53	14	13.3	14	15.6	13	34.4	53	5.0	113	10.6	173	16.3
54	14	13.5	14	15.9	13	34.6	54	5.1	114	10.7	174	16.4
55	14	13.8	14	16.1	13	34.9	55	5.2	115	10.8	175	16.5
56	14	14.0	14	16.4	13	35.1	56	5.3	116	10.9	176	16.6
57	14	14.3	14	16.6	13	35.3	57	5.4	117	11.0	177	16.7
58	14	14.5	14	16.9	13	35.6	58	5.5	118	11.1	178	16.8
59	14	14.8	14	17.1	13	35.8	59	5.6	119	11.2	179	16.9
60	14	15.0	14	17.4	13	36.1	60	5.7	120	11.3	180	17.0

0 h 57 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	14	15.0	14	17.4	13	36.1	0	.0	60	5.8	120	11.5
1	14	15.3	14	17.6	13	36.3	1	.1	61	5.8	121	11.6
2	14	15.5	14	17.9	13	36.5	2	.2	62	5.9	122	11.7
3	14	15.8	14	18.1	13	36.8	3	.3	63	6.0	123	11.8
4	14	16.0	14	18.4	13	37.0	4	.4	64	6.1	124	11.9
5	14	16.3	14	18.6	13	37.2	5	.5	65	6.2	125	12.0
6	14	16.5	14	18.9	13	37.5	6	.6	66	6.3	126	12.1
7	14	16.8	14	19.1	13	37.7	7	.7	67	6.4	127	12.2
8	14	17.0	14	19.4	13	38.0	8	.8	68	6.5	128	12.3
9	14	17.3	14	19.6	13	38.2	9	.9	69	6.6	129	12.4
10	14	17.5	14	19.9	13	38.4	10	1.0	70	6.7	130	12.5
11	14	17.8	14	20.1	13	38.7	11	1.1	71	6.8	131	12.6
12	14	18.0	14	20.4	13	38.9	12	1.2	72	6.9	132	12.7
13	14	18.3	14	20.6	13	39.2	13	1.2	73	7.0	133	12.7
14	14	18.5	14	20.9	13	39.4	14	1.3	74	7.1	134	12.8
15	14	18.8	14	21.1	13	39.6	15	1.4	75	7.2	135	12.9
16	14	19.0	14	21.4	13	39.9	16	1.5	76	7.3	136	13.0
17	14	19.3	14	21.6	13	40.1	17	1.6	77	7.4	137	13.1
18	14	19.5	14	21.9	13	40.3	18	1.7	78	7.5	138	13.2
19	14	19.8	14	22.1	13	40.6	19	1.8	79	7.6	139	13.3
20	14	20.0	14	22.4	13	40.8	20	1.9	80	7.7	140	13.4
21	14	20.3	14	22.6	13	41.1	21	2.0	81	7.8	141	13.5
22	14	20.5	14	22.9	13	41.3	22	2.1	82	7.9	142	13.6
23	14	20.8	14	23.1	13	41.5	23	2.2	83	8.0	143	13.7
24	14	21.0	14	23.4	13	41.8	24	2.3	84	8.1	144	13.8
25	14	21.3	14	23.6	13	42.0	25	2.4	85	8.1	145	13.9
26	14	21.5	14	23.9	13	42.3	26	2.5	86	8.2	146	14.0
27	14	21.8	14	24.1	13	42.5	27	2.6	87	8.3	147	14.1
28	14	22.0	14	24.4	13	42.7	28	2.7	88	8.4	148	14.2
29	14	22.3	14	24.6	13	43.0	29	2.8	89	8.5	149	14.3
30	14	22.5	14	24.9	13	43.2	30	2.9	90	8.6	150	14.4
31	14	22.8	14	25.1	13	43.4	31	3.0	91	8.7	151	14.5
32	14	23.0	14	25.4	13	43.7	32	3.1	92	8.8	152	14.6
33	14	23.3	14	25.6	13	43.9	33	3.2	93	8.9	153	14.7
34	14	23.5	14	25.9	13	44.2	34	3.3	94	9.0	154	14.8
35	14	23.8	14	26.1	13	44.4	35	3.4	95	9.1	155	14.9
36	14	24.0	14	26.4	13	44.6	36	3.5	96	9.2	156	15.0
37	14	24.3	14	26.7	13	44.9	37	3.5	97	9.3	157	15.0
38	14	24.5	14	26.9	13	45.1	38	3.6	98	9.4	158	15.1
39	14	24.8	14	27.2	13	45.4	39	3.7	99	9.5	159	15.2
40	14	25.0	14	27.4	13	45.6	40	3.8	100	9.6	160	15.3
41	14	25.3	14	27.7	13	45.8	41	3.9	101	9.7	161	15.4
42	14	25.5	14	27.9	13	46.1	42	4.0	102	9.8	162	15.5
43	14	25.8	14	28.2	13	46.3	43	4.1	103	9.9	163	15.6
44	14	26.0	14	28.4	13	46.5	44	4.2	104	10.0	164	15.7
45	14	26.3	14	28.7	13	46.8	45	4.3	105	10.1	165	15.8
46	14	26.5	14	28.9	13	47.0	46	4.4	106	10.2	166	15.9
47	14	26.8	14	29.2	13	47.3	47	4.5	107	10.3	167	16.0
48	14	27.0	14	29.4	13	47.5	48	4.6	108	10.4	168	16.1
49	14	27.3	14	29.7	13	47.7	49	4.7	109	10.4	169	16.2
50	14	27.5	14	29.9	13	48.0	50	4.8	110	10.5	170	16.3
51	14	27.8	14	30.2	13	48.2	51	4.9	111	10.6	171	16.4
52	14	28.0	14	30.4	13	48.5	52	5.0	112	10.7	172	16.5
53	14	28.3	14	30.7	13	48.7	53	5.1	113	10.8	173	16.6
54	14	28.5	14	30.9	13	48.9	54	5.2	114	10.9	174	16.7
55	14	28.8	14	31.2	13	49.2	55	5.3	115	11.0	175	16.8
56	14	29.0	14	31.4	13	49.4	56	5.4	116	11.1	176	16.9
57	14	29.3	14	31.7	13	49.7	57	5.5	117	11.2	177	17.0
58	14	29.5	14	31.9	13	49.9	58	5.6	118	11.3	178	17.1
59	14	29.8	14	32.2	13	50.1	59	5.7	119	11.4	179	17.2
60	14	30.0	14	32.4	13	50.4	60	5.8	120	11.5	180	17.3

0 h 58 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	14 30.0	14 32.4	13 50.4	0	.0	60	5.9	120	11.7
1	14 30.3	14 32.7	13 50.6	1	.1	61	5.9	121	11.8
2	14 30.5	14 32.9	13 50.8	2	.2	62	6.0	122	11.9
3	14 30.8	14 33.2	13 51.1	3	.3	63	6.1	123	12.0
4	14 31.0	14 33.4	13 51.3	4	.4	64	6.2	124	12.1
5	14 31.3	14 33.7	13 51.6	5	.5	65	6.3	125	12.2
6	14 31.5	14 33.9	13 51.8	6	.6	66	6.4	126	12.3
7	14 31.8	14 34.2	13 52.0	7	.7	67	6.5	127	12.4
8	14 32.0	14 34.4	13 52.3	8	.8	68	6.6	128	12.5
9	14 32.3	14 34.7	13 52.5	9	.9	69	6.7	129	12.6
10	14 32.5	14 34.9	13 52.8	10	1.0	70	6.8	130	12.7
11	14 32.8	14 35.2	13 53.0	11	1.1	71	6.9	131	12.8
12	14 33.0	14 35.4	13 53.2	12	1.2	72	7.0	132	12.9
13	14 33.3	14 35.7	13 53.5	13	1.3	73	7.1	133	13.0
14	14 33.5	14 35.9	13 53.7	14	1.4	74	7.2	134	13.1
15	14 33.8	14 36.2	13 53.9	15	1.5	75	7.3	135	13.2
16	14 34.0	14 36.4	13 54.2	16	1.6	76	7.4	136	13.3
17	14 34.3	14 36.7	13 54.4	17	1.7	77	7.5	137	13.4
18	14 34.5	14 36.9	13 54.7	18	1.8	78	7.6	138	13.5
19	14 34.8	14 37.2	13 54.9	19	1.9	79	7.7	139	13.6
20	14 35.0	14 37.4	13 55.1	20	2.0	80	7.8	140	13.7
21	14 35.3	14 37.7	13 55.4	21	2.0	81	7.9	141	13.7
22	14 35.5	14 37.9	13 55.6	22	2.1	82	8.0	142	13.8
23	14 35.8	14 38.2	13 55.9	23	2.2	83	8.1	143	13.9
24	14 36.0	14 38.4	13 56.1	24	2.3	84	8.2	144	14.0
25	14 36.3	14 38.7	13 56.3	25	2.4	85	8.3	145	14.1
26	14 36.5	14 38.9	13 56.6	26	2.5	86	8.4	146	14.2
27	14 36.8	14 39.2	13 56.8	27	2.6	87	8.5	147	14.3
28	14 37.0	14 39.4	13 57.0	28	2.7	88	8.6	148	14.4
29	14 37.3	14 39.7	13 57.3	29	2.8	89	8.7	149	14.5
30	14 37.5	14 39.9	13 57.5	30	2.9	90	8.8	150	14.6
31	14 37.8	14 40.2	13 57.8	31	3.0	91	8.9	151	14.7
32	14 38.0	14 40.4	13 58.0	32	3.1	92	9.0	152	14.8
33	14 38.3	14 40.7	13 58.2	33	3.2	93	9.1	153	14.9
34	14 38.5	14 40.9	13 58.5	34	3.3	94	9.2	154	15.0
35	14 38.8	14 41.2	13 58.7	35	3.4	95	9.3	155	15.1
36	14 39.0	14 41.4	13 59.0	36	3.5	96	9.4	156	15.2
37	14 39.3	14 41.7	13 59.2	37	3.6	97	9.5	157	15.3
38	14 39.5	14 41.9	13 59.4	38	3.7	98	9.6	158	15.4
39	14 39.8	14 42.2	13 59.7	39	3.8	99	9.7	159	15.5
40	14 40.0	14 42.4	13 59.9	40	3.9	100	9.8	160	15.6
41	14 40.3	14 42.7	14 .1	41	4.0	101	9.8	161	15.7
42	14 40.5	14 42.9	14 .4	42	4.1	102	9.9	162	15.8
43	14 40.8	14 43.2	14 .6	43	4.2	103	10.0	163	15.9
44	14 41.0	14 43.4	14 .9	44	4.3	104	10.1	164	16.0
45	14 41.3	14 43.7	14 1.1	45	4.4	105	10.2	165	16.1
46	14 41.5	14 43.9	14 1.3	46	4.5	106	10.3	166	16.2
47	14 41.8	14 44.2	14 1.6	47	4.6	107	10.4	167	16.3
48	14 42.0	14 44.5	14 1.8	48	4.7	108	10.5	168	16.4
49	14 42.3	14 44.7	14 2.1	49	4.8	109	10.6	169	16.5
50	14 42.5	14 45.0	14 2.3	50	4.9	110	10.7	170	16.6
51	14 42.8	14 45.2	14 2.5	51	5.0	111	10.8	171	16.7
52	14 43.0	14 45.5	14 2.8	52	5.1	112	10.9	172	16.8
53	14 43.3	14 45.7	14 3.0	53	5.2	113	11.0	173	16.9
54	14 43.5	14 46.0	14 3.3	54	5.3	114	11.1	174	17.0
55	14 43.8	14 46.2	14 3.5	55	5.4	115	11.2	175	17.1
56	14 44.0	14 46.5	14 3.7	56	5.5	116	11.3	176	17.2
57	14 44.3	14 46.7	14 4.0	57	5.6	117	11.4	177	17.3
58	14 44.5	14 47.0	14 4.2	58	5.7	118	11.5	178	17.4
59	14 44.8	14 47.2	14 4.4	59	5.8	119	11.6	179	17.5
60	14 45.0	14 47.5	14 4.7	60	5.9	120	11.7	180	17.6

0 h 59 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	14 45.0	14 47.5	14 4.7	0	.0	60	6.0	120	11.9
1	14 45.3	14 47.7	14 4.9	1	.1	61	6.0	121	12.0
2	14 45.5	14 48.0	14 5.2	2	.2	62	6.1	122	12.1
3	14 45.8	14 48.2	14 5.4	3	.3	63	6.2	123	12.2
4	14 46.0	14 48.5	14 5.6	4	.4	64	6.3	124	12.3
5	14 46.3	14 48.7	14 5.9	5	.5	65	6.4	125	12.4
6	14 46.5	14 49.0	14 6.1	6	.6	66	6.5	126	12.5
7	14 46.8	14 49.2	14 6.4	7	.7	67	6.6	127	12.6
8	14 47.0	14 49.5	14 6.6	8	.8	68	6.7	128	12.7
9	14 47.3	14 49.7	14 6.8	9	.9	69	6.8	129	12.8
10	14 47.5	14 50.0	14 7.1	10	1.0	70	6.9	130	12.9
11	14 47.8	14 50.2	14 7.3	11	1.1	71	7.0	131	13.0
12	14 48.0	14 50.5	14 7.5	12	1.2	72	7.1	132	13.1
13	14 48.3	14 50.7	14 7.8	13	1.3	73	7.2	133	13.2
14	14 48.5	14 51.0	14 8.0	14	1.4	74	7.3	134	13.3
15	14 48.8	14 51.2	14 8.3	15	1.5	75	7.4	135	13.4
16	14 49.0	14 51.5	14 8.5	16	1.6	76	7.5	136	13.5
17	14 49.3	14 51.7	14 8.7	17	1.7	77	7.6	137	13.6
18	14 49.5	14 52.0	14 9.0	18	1.8	78	7.7	138	13.7
19	14 49.8	14 52.2	14 9.2	19	1.9	79	7.8	139	13.8
20	14 50.0	14 52.5	14 9.5	20	2.0	80	7.9	140	13.9
21	14 50.3	14 52.7	14 9.7	21	2.1	81	8.0	141	14.0
22	14 50.5	14 53.0	14 9.9	22	2.2	82	8.1	142	14.1
23	14 50.8	14 53.2	14 10.2	23	2.3	83	8.2	143	14.2
24	14 51.0	14 53.5	14 10.4	24	2.4	84	8.3	144	14.3
25	14 51.3	14 53.7	14 10.6	25	2.5	85	8.4	145	14.4
26	14 51.5	14 54.0	14 10.9	26	2.6	86	8.5	146	14.5
27	14 51.8	14 54.2	14 11.1	27	2.7	87	8.6	147	14.6
28	14 52.0	14 54.5	14 11.4	28	2.8	88	8.7	148	14.7
29	14 52.3	14 54.7	14 11.6	29	2.9	89	8.8	149	14.8
30	14 52.5	14 55.0	14 11.8	30	3.0	90	8.9	150	14.9
31	14 52.8	14 55.2	14 12.1	31	3.1	91	9.0	151	15.0
32	14 53.0	14 55.5	14 12.3	32	3.2	92	9.1	152	15.1
33	14 53.3	14 55.7	14 12.6	33	3.3	93	9.2	153	15.2
34	14 53.5	14 56.0	14 12.8	34	3.4	94	9.3	154	15.3
35	14 53.8	14 56.2	14 13.0	35	3.5	95	9.4	155	15.4
36	14 54.0	14 56.5	14 13.3	36	3.6	96	9.5	156	15.5
37	14 54.3	14 56.7	14 13.5	37	3.7	97	9.6	157	15.6
38	14 54.5	14 57.0	14 13.8	38	3.8	98	9.7	158	15.7
39	14 54.8	14 57.2	14 14.0	39	3.9	99	9.8	159	15.8
40	14 55.0	14 57.5	14 14.2	40	4.0	100	9.9	160	15.9
41	14 55.3	14 57.7	14 14.5	41	4.1	101	10.0	161	16.0
42	14 55.5	14 58.0	14 14.7	42	4.2	102	10.1	162	16.1
43	14 55.8	14 58.2	14 14.9	43	4.3	103	10.2	163	16.2
44	14 56.0	14 58.5	14 15.2	44	4.4	104	10.3	164	16.3
45	14 56.3	14 58.7	14 15.4	45	4.5	105	10.4	165	16.4
46	14 56.5	14 59.0	14 15.7	46	4.6	106	10.5	166	16.5
47	14 56.8	14 59.2	14 15.9	47	4.7	107	10.6	167	16.6
48	14 57.0	14 59.5	14 16.1	48	4.8	108	10.7	168	16.7
49	14 57.3	14 59.7	14 16.4	49	4.9	109	10.8	169	16.8
50	14 57.5	14 60.0	14 16.6	50	5.0	110	10.9	170	16.9
51	14 57.8	15 .2	14 16.9	51	5.1	111	11.0	171	17.0
52	14 58.0	15 .5	14 17.1	52	5.2	112	11.1	172	17.1
53	14 58.3	15 .7	14 17.3	53	5.3	113	11.2	173	17.2
54	14 58.5	15 1.0	14 17.6	54	5.4	114	11.3	174	17.3
55	14 58.8	15 1.2	14 17.8	55	5.5	115	11.4	175	17.4
56	14 59.0	15 1.5	14 18.0	56	5.6	116	11.5	176	17.5
57	14 59.3	15 1.7	14 18.3	57	5.7	117	11.6	177	17.6
58	14 59.5	15 2.0	14 18.5	58	5.8	118	11.7	178	17.7
59	14 59.8	15 2.2	14 18.8	59	5.9	119	11.8	179	17.8
60	15 .0	15 2.5	14 19.0	60	6.0	120	11.9	180	17.9

1 h 0 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 .0	15 2.5	14 19.0	0	.0	60	6.1	120	12.1
1	15 .3	15 2.8	14 19.2	1	.1	61	6.2	121	12.2
2	15 .5	15 3.0	14 19.5	2	.2	62	6.3	122	12.3
3	15 .8	15 3.3	14 19.7	3	.3	63	6.4	123	12.4
4	15 1.0	15 3.5	14 20.0	4	.4	64	6.5	124	12.5
5	15 1.3	15 3.8	14 20.2	5	.5	65	6.6	125	12.6
6	15 1.5	15 4.0	14 20.4	6	.6	66	6.7	126	12.7
7	15 1.8	15 4.3	14 20.7	7	.7	67	6.8	127	12.8
8	15 2.0	15 4.5	14 20.9	8	.8	68	6.9	128	12.9
9	15 2.3	15 4.8	14 21.1	9	.9	69	7.0	129	13.0
10	15 2.5	15 5.0	14 21.4	10	1.0	70	7.1	130	13.1
11	15 2.8	15 5.3	14 21.6	11	1.1	71	7.2	131	13.2
12	15 3.0	15 5.5	14 21.9	12	1.2	72	7.3	132	13.3
13	15 3.3	15 5.8	14 22.1	13	1.3	73	7.4	133	13.4
14	15 3.5	15 6.0	14 22.3	14	1.4	74	7.5	134	13.5
15	15 3.8	15 6.3	14 22.6	15	1.5	75	7.6	135	13.6
16	15 4.0	15 6.5	14 22.8	16	1.6	76	7.7	136	13.7
17	15 4.3	15 6.8	14 23.1	17	1.7	77	7.8	137	13.8
18	15 4.5	15 7.0	14 23.3	18	1.8	78	7.9	138	13.9
19	15 4.8	15 7.3	14 23.5	19	1.9	79	8.0	139	14.0
20	15 5.0	15 7.5	14 23.8	20	2.0	80	8.1	140	14.1
21	15 5.3	15 7.8	14 24.0	21	2.1	81	8.2	141	14.2
22	15 5.5	15 8.0	14 24.2	22	2.2	82	8.3	142	14.3
23	15 5.8	15 8.3	14 24.5	23	2.3	83	8.4	143	14.4
24	15 6.0	15 8.5	14 24.7	24	2.4	84	8.5	144	14.5
25	15 6.3	15 8.8	14 25.0	25	2.5	85	8.6	145	14.6
26	15 6.5	15 9.0	14 25.2	26	2.6	86	8.7	146	14.7
27	15 6.8	15 9.3	14 25.4	27	2.7	87	8.8	147	14.8
28	15 7.0	15 9.5	14 25.7	28	2.8	88	8.9	148	14.9
29	15 7.3	15 9.8	14 25.9	29	2.9	89	9.0	149	15.0
30	15 7.5	15 10.0	14 26.2	30	3.0	90	9.1	150	15.1
31	15 7.8	15 10.3	14 26.4	31	3.1	91	9.2	151	15.2
32	15 8.0	15 10.5	14 26.6	32	3.2	92	9.3	152	15.3
33	15 8.3	15 10.8	14 26.9	33	3.3	93	9.4	153	15.4
34	15 8.5	15 11.0	14 27.1	34	3.4	94	9.5	154	15.5
35	15 8.8	15 11.3	14 27.4	35	3.5	95	9.6	155	15.6
36	15 9.0	15 11.5	14 27.6	36	3.6	96	9.7	156	15.7
37	15 9.3	15 11.8	14 27.8	37	3.7	97	9.8	157	15.8
38	15 9.5	15 12.0	14 28.1	38	3.8	98	9.9	158	15.9
39	15 9.8	15 12.3	14 28.3	39	3.9	99	10.0	159	16.0
40	15 10.0	15 12.5	14 28.5	40	4.0	100	10.1	160	16.1
41	15 10.3	15 12.8	14 28.8	41	4.1	101	10.2	161	16.2
42	15 10.5	15 13.0	14 29.0	42	4.2	102	10.3	162	16.3
43	15 10.8	15 13.3	14 29.3	43	4.3	103	10.4	163	16.4
44	15 11.0	15 13.5	14 29.5	44	4.4	104	10.5	164	16.5
45	15 11.3	15 13.8	14 29.7	45	4.5	105	10.6	165	16.6
46	15 11.5	15 14.0	14 30.0	46	4.6	106	10.7	166	16.7
47	15 11.8	15 14.3	14 30.2	47	4.7	107	10.8	167	16.8
48	15 12.0	15 14.5	14 30.5	48	4.8	108	10.9	168	16.9
49	15 12.3	15 14.8	14 30.7	49	4.9	109	11.0	169	17.0
50	15 12.5	15 15.0	14 30.9	50	5.0	110	11.1	170	17.1
51	15 12.8	15 15.3	14 31.2	51	5.1	111	11.2	171	17.2
52	15 13.0	15 15.5	14 31.4	52	5.2	112	11.3	172	17.3
53	15 13.3	15 15.8	14 31.6	53	5.3	113	11.4	173	17.4
54	15 13.5	15 16.0	14 31.9	54	5.4	114	11.5	174	17.5
55	15 13.8	15 16.3	14 32.1	55	5.5	115	11.6	175	17.6
56	15 14.0	15 16.5	14 32.4	56	5.6	116	11.7	176	17.7
57	15 14.3	15 16.8	14 32.6	57	5.7	117	11.8	177	17.8
58	15 14.5	15 17.0	14 32.8	58	5.8	118	11.9	178	17.9
59	15 14.8	15 17.3	14 33.1	59	5.9	119	12.0	179	18.0
60	15 15.0	15 17.5	14 33.3	60	6.1	120	12.1	180	18.2

1 h 1 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 15.0	15 17.5	14 33.3	0	.0	60	6.2	120	12.3
1	15 15.3	15 17.8	14 33.6	1	.1	61	6.3	121	12.4
2	15 15.5	15 18.0	14 33.8	2	.2	62	6.4	122	12.5
3	15 15.8	15 18.3	14 34.0	3	.3	63	6.5	123	12.6
4	15 16.0	15 18.5	14 34.3	4	.4	64	6.6	124	12.7
5	15 16.3	15 18.8	14 34.5	5	.5	65	6.7	125	12.8
6	15 16.5	15 19.0	14 34.7	6	.6	66	6.8	126	12.9
7	15 16.8	15 19.3	14 35.0	7	.7	67	6.9	127	13.0
8	15 17.0	15 19.5	14 35.2	8	.8	68	7.0	128	13.1
9	15 17.3	15 19.8	14 35.5	9	.9	69	7.1	129	13.2
10	15 17.5	15 20.0	14 35.7	10	1.0	70	7.2	130	13.3
11	15 17.8	15 20.3	14 35.9	11	1.1	71	7.3	131	13.4
12	15 18.0	15 20.6	14 36.2	12	1.2	72	7.4	132	13.5
13	15 18.3	15 20.8	14 36.4	13	1.3	73	7.5	133	13.6
14	15 18.5	15 21.1	14 36.7	14	1.4	74	7.6	134	13.7
15	15 18.8	15 21.3	14 36.9	15	1.5	75	7.7	135	13.8
16	15 19.0	15 21.6	14 37.1	16	1.6	76	7.8	136	13.9
17	15 19.3	15 21.8	14 37.4	17	1.7	77	7.9	137	14.0
18	15 19.5	15 22.1	14 37.6	18	1.8	78	8.0	138	14.1
19	15 19.8	15 22.3	14 37.9	19	1.9	79	8.1	139	14.2
20	15 20.0	15 22.6	14 38.1	20	2.1	80	8.2	140	14.4
21	15 20.3	15 22.8	14 38.3	21	2.2	81	8.3	141	14.5
22	15 20.5	15 23.1	14 38.6	22	2.3	82	8.4	142	14.6
23	15 20.8	15 23.3	14 38.8	23	2.4	83	8.5	143	14.7
24	15 21.0	15 23.6	14 39.0	24	2.5	84	8.6	144	14.8
25	15 21.3	15 23.8	14 39.3	25	2.6	85	8.7	145	14.9
26	15 21.5	15 24.1	14 39.5	26	2.7	86	8.8	146	15.0
27	15 21.8	15 24.3	14 39.8	27	2.8	87	8.9	147	15.1
28	15 22.0	15 24.6	14 40.0	28	2.9	88	9.0	148	15.2
29	15 22.3	15 24.8	14 40.2	29	3.0	89	9.1	149	15.3
30	15 22.5	15 25.1	14 40.5	30	3.1	90	9.2	150	15.4
31	15 22.8	15 25.3	14 40.7	31	3.2	91	9.3	151	15.5
32	15 23.0	15 25.6	14 41.0	32	3.3	92	9.4	152	15.6
33	15 23.3	15 25.8	14 41.2	33	3.4	93	9.5	153	15.7
34	15 23.5	15 26.1	14 41.4	34	3.5	94	9.6	154	15.8
35	15 23.8	15 26.3	14 41.7	35	3.6	95	9.7	155	15.9
36	15 24.0	15 26.6	14 41.9	36	3.7	96	9.8	156	16.0
37	15 24.3	15 26.8	14 42.1	37	3.8	97	9.9	157	16.1
38	15 24.5	15 27.1	14 42.4	38	3.9	98	10.0	158	16.2
39	15 24.8	15 27.3	14 42.6	39	4.0	99	10.1	159	16.3
40	15 25.0	15 27.6	14 42.9	40	4.1	100	10.3	160	16.4
41	15 25.3	15 27.8	14 43.1	41	4.2	101	10.4	161	16.5
42	15 25.5	15 28.1	14 43.3	42	4.3	102	10.5	162	16.6
43	15 25.8	15 28.3	14 43.6	43	4.4	103	10.6	163	16.7
44	15 26.0	15 28.6	14 43.8	44	4.5	104	10.7	164	16.8
45	15 26.3	15 28.8	14 44.1	45	4.6	105	10.8	165	16.9
46	15 26.5	15 29.1	14 44.3	46	4.7	106	10.9	166	17.0
47	15 26.8	15 29.3	14 44.5	47	4.8	107	11.0	167	17.1
48	15 27.0	15 29.6	14 44.8	48	4.9	108	11.1	168	17.2
49	15 27.3	15 29.8	14 45.0	49	5.0	109	11.2	169	17.3
50	15 27.5	15 30.1	14 45.2	50	5.1	110	11.3	170	17.4
51	15 27.8	15 30.3	14 45.5	51	5.2	111	11.4	171	17.5
52	15 28.0	15 30.6	14 45.7	52	5.3	112	11.5	172	17.6
53	15 28.3	15 30.8	14 46.0	53	5.4	113	11.6	173	17.7
54	15 28.5	15 31.1	14 46.2	54	5.5	114	11.7	174	17.8
55	15 28.8	15 31.3	14 46.4	55	5.6	115	11.8	175	17.9
56	15 29.0	15 31.6	14 46.7	56	5.7	116	11.9	176	18.0
57	15 29.3	15 31.8	14 46.9	57	5.8	117	12.0	177	18.1
58	15 29.5	15 32.1	14 47.2	58	5.9	118	12.1	178	18.2
59	15 29.8	15 32.3	14 47.4	59	6.0	119	12.2	179	18.3
60	15 30.0	15 32.6	14 47.6	60	6.2	120	12.3	180	18.5

1 h 2 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 30.0	15 32.6	14 47.6	0	.0	60	6.3	120	12.5
1	15 30.3	15 32.8	14 47.9	1	.1	61	6.4	121	12.6
2	15 30.5	15 33.1	14 48.1	2	.2	62	6.5	122	12.7
3	15 30.8	15 33.3	14 48.3	3	.3	63	6.6	123	12.8
4	15 31.0	15 33.6	14 48.6	4	.4	64	6.7	124	12.9
5	15 31.3	15 33.8	14 48.8	5	.5	65	6.8	125	13.0
6	15 31.5	15 34.1	14 49.1	6	.6	66	6.9	126	13.1
7	15 31.8	15 34.3	14 49.3	7	.7	67	7.0	127	13.2
8	15 32.0	15 34.6	14 49.5	8	.8	68	7.1	128	13.3
9	15 32.3	15 34.8	14 49.8	9	.9	69	7.2	129	13.4
10	15 32.5	15 35.1	14 50.0	10	1.0	70	7.3	130	13.5
11	15 32.8	15 35.3	14 50.3	11	1.1	71	7.4	131	13.6
12	15 33.0	15 35.6	14 50.5	12	1.3	72	7.5	132	13.8
13	15 33.3	15 35.8	14 50.7	13	1.4	73	7.6	133	13.9
14	15 33.5	15 36.1	14 51.0	14	1.5	74	7.7	134	14.0
15	15 33.8	15 36.3	14 51.2	15	1.6	75	7.8	135	14.1
16	15 34.0	15 36.6	14 51.5	16	1.7	76	7.9	136	14.2
17	15 34.3	15 36.8	14 51.7	17	1.8	77	8.0	137	14.3
18	15 34.5	15 37.1	14 51.9	18	1.9	78	8.1	138	14.4
19	15 34.8	15 37.3	14 52.2	19	2.0	79	8.2	139	14.5
20	15 35.0	15 37.6	14 52.4	20	2.1	80	8.3	140	14.6
21	15 35.3	15 37.8	14 52.6	21	2.2	81	8.4	141	14.7
22	15 35.5	15 38.1	14 52.9	22	2.3	82	8.5	142	14.8
23	15 35.8	15 38.3	14 53.1	23	2.4	83	8.6	143	14.9
24	15 36.0	15 38.6	14 53.4	24	2.5	84	8.8	144	15.0
25	15 36.3	15 38.9	14 53.6	25	2.6	85	8.9	145	15.1
26	15 36.5	15 39.1	14 53.8	26	2.7	86	9.0	146	15.2
27	15 36.8	15 39.4	14 54.1	27	2.8	87	9.1	147	15.3
28	15 37.0	15 39.6	14 54.3	28	2.9	88	9.2	148	15.4
29	15 37.3	15 39.9	14 54.6	29	3.0	89	9.3	149	15.5
30	15 37.5	15 40.1	14 54.8	30	3.1	90	9.4	150	15.6
31	15 37.8	15 40.4	14 55.0	31	3.2	91	9.5	151	15.7
32	15 38.0	15 40.6	14 55.3	32	3.3	92	9.6	152	15.8
33	15 38.3	15 40.9	14 55.5	33	3.4	93	9.7	153	15.9
34	15 38.5	15 41.1	14 55.7	34	3.5	94	9.8	154	16.0
35	15 38.8	15 41.4	14 56.0	35	3.6	95	9.9	155	16.1
36	15 39.0	15 41.6	14 56.2	36	3.8	96	10.0	156	16.3
37	15 39.3	15 41.9	14 56.5	37	3.9	97	10.1	157	16.4
38	15 39.5	15 42.1	14 56.7	38	4.0	98	10.2	158	16.5
39	15 39.8	15 42.4	14 56.9	39	4.1	99	10.3	159	16.6
40	15 40.0	15 42.6	14 57.2	40	4.2	100	10.4	160	16.7
41	15 40.3	15 42.9	14 57.4	41	4.3	101	10.5	161	16.8
42	15 40.5	15 43.1	14 57.7	42	4.4	102	10.6	162	16.9
43	15 40.8	15 43.4	14 57.9	43	4.5	103	10.7	163	17.0
44	15 41.0	15 43.6	14 58.1	44	4.6	104	10.8	164	17.1
45	15 41.3	15 43.9	14 58.4	45	4.7	105	10.9	165	17.2
46	15 41.5	15 44.1	14 58.6	46	4.8	106	11.0	166	17.3
47	15 41.8	15 44.4	14 58.8	47	4.9	107	11.1	167	17.4
48	15 42.0	15 44.6	14 59.1	48	5.0	108	11.3	168	17.5
49	15 42.3	15 44.9	14 59.3	49	5.1	109	11.4	169	17.6
50	15 42.5	15 45.1	14 59.6	50	5.2	110	11.5	170	17.7
51	15 42.8	15 45.4	14 59.8	51	5.3	111	11.6	171	17.8
52	15 43.0	15 45.6	15 .0	52	5.4	112	11.7	172	17.9
53	15 43.3	15 45.9	15 .3	53	5.5	113	11.8	173	18.0
54	15 43.5	15 46.1	15 .5	54	5.6	114	11.9	174	18.1
55	15 43.8	15 46.4	15 .8	55	5.7	115	12.0	175	18.2
56	15 44.0	15 46.6	15 1.0	56	5.8	116	12.1	176	18.3
57	15 44.3	15 46.9	15 1.2	57	5.9	117	12.2	177	18.4
58	15 44.5	15 47.1	15 1.5	58	6.0	118	12.3	178	18.5
59	15 44.8	15 47.4	15 1.7	59	6.1	119	12.4	179	18.6
60	15 45.0	15 47.6	15 2.0	60	6.3	120	12.5	180	18.8

1 h 3 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	15 45.0	15 47.6	15 2.0	0	.0	60	6.4	120	12.7
1	15 45.3	15 47.9	15 2.2	1	.1	61	6.5	121	12.8
2	15 45.5	15 48.1	15 2.4	2	.2	62	6.6	122	12.9
3	15 45.8	15 48.4	15 2.7	3	.3	63	6.7	123	13.0
4	15 46.0	15 48.6	15 2.9	4	.4	64	6.8	124	13.1
5	15 46.3	15 48.9	15 3.1	5	.5	65	6.9	125	13.2
6	15 46.5	15 49.1	15 3.4	6	.6	66	7.0	126	13.3
7	15 46.8	15 49.4	15 3.6	7	.7	67	7.1	127	13.4
8	15 47.0	15 49.6	15 3.9	8	.8	68	7.2	128	13.5
9	15 47.3	15 49.9	15 4.1	9	1.0	69	7.3	129	13.7
10	15 47.5	15 50.1	15 4.3	10	1.1	70	7.4	130	13.8
11	15 47.8	15 50.4	15 4.6	11	1.2	71	7.5	131	13.9
12	15 48.0	15 50.6	15 4.8	12	1.3	72	7.6	132	14.0
13	15 48.3	15 50.9	15 5.1	13	1.4	73	7.7	133	14.1
14	15 48.5	15 51.1	15 5.3	14	1.5	74	7.8	134	14.2
15	15 48.8	15 51.4	15 5.5	15	1.6	75	7.9	135	14.3
16	15 49.0	15 51.6	15 5.8	16	1.7	76	8.0	136	14.4
17	15 49.3	15 51.9	15 6.0	17	1.8	77	8.1	137	14.5
18	15 49.5	15 52.1	15 6.2	18	1.9	78	8.3	138	14.6
19	15 49.8	15 52.4	15 6.5	19	2.0	79	8.4	139	14.7
20	15 50.0	15 52.6	15 6.7	20	2.1	80	8.5	140	14.8
21	15 50.3	15 52.9	15 7.0	21	2.2	81	8.6	141	14.9
22	15 50.5	15 53.1	15 7.2	22	2.3	82	8.7	142	15.0
23	15 50.8	15 53.4	15 7.4	23	2.4	83	8.8	143	15.1
24	15 51.0	15 53.6	15 7.7	24	2.5	84	8.9	144	15.2
25	15 51.3	15 53.9	15 7.9	25	2.6	85	9.0	145	15.3
26	15 51.5	15 54.1	15 8.2	26	2.8	86	9.1	146	15.5
27	15 51.8	15 54.4	15 8.4	27	2.9	87	9.2	147	15.6
28	15 52.0	15 54.6	15 8.6	28	3.0	88	9.3	148	15.7
29	15 52.3	15 54.9	15 8.9	29	3.1	89	9.4	149	15.8
30	15 52.5	15 55.1	15 9.1	30	3.2	90	9.5	150	15.9
31	15 52.8	15 55.4	15 9.3	31	3.3	91	9.6	151	16.0
32	15 53.0	15 55.6	15 9.6	32	3.4	92	9.7	152	16.1
33	15 53.3	15 55.9	15 9.8	33	3.5	93	9.8	153	16.2
34	15 53.5	15 56.1	15 10.1	34	3.6	94	9.9	154	16.3
35	15 53.8	15 56.4	15 10.3	35	3.7	95	10.1	155	16.4
36	15 54.0	15 56.7	15 10.5	36	3.8	96	10.2	156	16.5
37	15 54.3	15 56.9	15 10.8	37	3.9	97	10.3	157	16.6
38	15 54.5	15 57.2	15 11.0	38	4.0	98	10.4	158	16.7
39	15 54.8	15 57.4	15 11.3	39	4.1	99	10.5	159	16.8
40	15 55.0	15 57.7	15 11.5	40	4.2	100	10.6	160	16.9
41	15 55.3	15 57.9	15 11.7	41	4.3	101	10.7	161	17.0
42	15 55.5	15 58.2	15 12.0	42	4.4	102	10.8	162	17.1
43	15 55.8	15 58.4	15 12.2	43	4.6	103	10.9	163	17.3
44	15 56.0	15 58.7	15 12.4	44	4.7	104	11.0	164	17.4
45	15 56.3	15 58.9	15 12.7	45	4.8	105	11.1	165	17.5
46	15 56.5	15 59.2	15 12.9	46	4.9	106	11.2	166	17.6
47	15 56.8	15 59.4	15 13.2	47	5.0	107	11.3	167	17.7
48	15 57.0	15 59.7	15 13.4	48	5.1	108	11.4	168	17.8
49	15 57.3	15 59.9	15 13.6	49	5.2	109	11.5	169	17.9
50	15 57.5	16 .2	15 13.9	50	5.3	110	11.6	170	18.0
51	15 57.8	16 .4	15 14.1	51	5.4	111	11.7	171	18.1
52	15 58.0	16 .7	15 14.4	52	5.5	112	11.9	172	18.2
53	15 58.3	16 .9	15 14.6	53	5.6	113	12.0	173	18.3
54	15 58.5	16 1.2	15 14.8	54	5.7	114	12.1	174	18.4
55	15 58.8	16 1.4	15 15.1	55	5.8	115	12.2	175	18.5
56	15 59.0	16 1.7	15 15.3	56	5.9	116	12.3	176	18.6
57	15 59.3	16 1.9	15 15.6	57	6.0	117	12.4	177	18.7
58	15 59.5	16 2.2	15 15.8	58	6.1	118	12.5	178	18.8
59	15 59.8	16 2.4	15 16.0	59	6.2	119	12.6	179	18.9
60	16 .0	16 2.7	15 16.3	60	6.4	120	12.7	180	19.1

1 h 4 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	16	.0	16	2.7	15	16.3	0	.0	60	6.5	120	12.9
1	16	.3	16	2.9	15	16.5	1	.1	61	6.6	121	13.0
2	16	.5	16	3.2	15	16.7	2	.2	62	6.7	122	13.1
3	16	.8	16	3.4	15	17.0	3	.3	63	6.8	123	13.2
4	16	1.0	16	3.7	15	17.2	4	.4	64	6.9	124	13.3
5	16	1.3	16	3.9	15	17.5	5	.5	65	7.0	125	13.4
6	16	1.5	16	4.2	15	17.7	6	.6	66	7.1	126	13.5
7	16	1.8	16	4.4	15	17.9	7	.8	67	7.2	127	13.7
8	16	2.0	16	4.7	15	18.2	8	.9	68	7.3	128	13.8
9	16	2.3	16	4.9	15	18.4	9	1.0	69	7.4	129	13.9
10	16	2.5	16	5.2	15	18.7	10	1.1	70	7.5	130	14.0
11	16	2.8	16	5.4	15	18.9	11	1.2	71	7.6	131	14.1
12	16	3.0	16	5.7	15	19.1	12	1.3	72	7.7	132	14.2
13	16	3.3	16	5.9	15	19.4	13	1.4	73	7.8	133	14.3
14	16	3.5	16	6.2	15	19.6	14	1.5	74	8.0	134	14.4
15	16	3.8	16	6.4	15	19.8	15	1.6	75	8.1	135	14.5
16	16	4.0	16	6.7	15	20.1	16	1.7	76	8.2	136	14.6
17	16	4.3	16	6.9	15	20.3	17	1.8	77	8.3	137	14.7
18	16	4.5	16	7.2	15	20.6	18	1.9	78	8.4	138	14.8
19	16	4.8	16	7.4	15	20.8	19	2.0	79	8.5	139	14.9
20	16	5.0	16	7.7	15	21.0	20	2.2	80	8.6	140	15.1
21	16	5.3	16	7.9	15	21.3	21	2.3	81	8.7	141	15.2
22	16	5.5	16	8.2	15	21.5	22	2.4	82	8.8	142	15.3
23	16	5.8	16	8.4	15	21.8	23	2.5	83	8.9	143	15.4
24	16	6.0	16	8.7	15	22.0	24	2.6	84	9.0	144	15.5
25	16	6.3	16	8.9	15	22.2	25	2.7	85	9.1	145	15.6
26	16	6.5	16	9.2	15	22.5	26	2.8	86	9.2	146	15.7
27	16	6.8	16	9.4	15	22.7	27	2.9	87	9.4	147	15.8
28	16	7.0	16	9.7	15	22.9	28	3.0	88	9.5	148	15.9
29	16	7.3	16	9.9	15	23.2	29	3.1	89	9.6	149	16.0
30	16	7.5	16	10.2	15	23.4	30	3.2	90	9.7	150	16.1
31	16	7.8	16	10.4	15	23.7	31	3.3	91	9.8	151	16.2
32	16	8.0	16	10.7	15	23.9	32	3.4	92	9.9	152	16.3
33	16	8.3	16	10.9	15	24.1	33	3.5	93	10.0	153	16.4
34	16	8.5	16	11.2	15	24.4	34	3.7	94	10.1	154	16.6
35	16	8.8	16	11.4	15	24.6	35	3.8	95	10.2	155	16.7
36	16	9.0	16	11.7	15	24.9	36	3.9	96	10.3	156	16.8
37	16	9.3	16	11.9	15	25.1	37	4.0	97	10.4	157	16.9
38	16	9.5	16	12.2	15	25.3	38	4.1	98	10.5	158	17.0
39	16	9.8	16	12.4	15	25.6	39	4.2	99	10.6	159	17.1
40	16	10.0	16	12.7	15	25.8	40	4.3	100	10.8	160	17.2
41	16	10.3	16	12.9	15	26.0	41	4.4	101	10.9	161	17.3
42	16	10.5	16	13.2	15	26.3	42	4.5	102	11.0	162	17.4
43	16	10.8	16	13.4	15	26.5	43	4.6	103	11.1	163	17.5
44	16	11.0	16	13.7	15	26.8	44	4.7	104	11.2	164	17.6
45	16	11.3	16	13.9	15	27.0	45	4.8	105	11.3	165	17.7
46	16	11.5	16	14.2	15	27.2	46	4.9	106	11.4	166	17.8
47	16	11.8	16	14.4	15	27.5	47	5.1	107	11.5	167	18.0
48	16	12.0	16	14.7	15	27.7	48	5.2	108	11.6	168	18.1
49	16	12.3	16	15.0	15	28.0	49	5.3	109	11.7	169	18.2
50	16	12.5	16	15.2	15	28.2	50	5.4	110	11.8	170	18.3
51	16	12.8	16	15.5	15	28.4	51	5.5	111	11.9	171	18.4
52	16	13.0	16	15.7	15	28.7	52	5.6	112	12.0	172	18.5
53	16	13.3	16	16.0	15	28.9	53	5.7	113	12.1	173	18.6
54	16	13.5	16	16.2	15	29.2	54	5.8	114	12.3	174	18.7
55	16	13.8	16	16.5	15	29.4	55	5.9	115	12.4	175	18.8
56	16	14.0	16	16.7	15	29.6	56	6.0	116	12.5	176	18.9
57	16	14.3	16	17.0	15	29.9	57	6.1	117	12.6	177	19.0
58	16	14.5	16	17.2	15	30.1	58	6.2	118	12.7	178	19.1
59	16	14.8	16	17.5	15	30.3	59	6.3	119	12.8	179	19.2
60	16	15.0	16	17.7	15	30.6	60	6.5	120	12.9	180	19.4

1 h 5 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	16	15.0	16	17.7	15	30.6	0	.0	60	6.6	120	13.1
1	16	15.3	16	18.0	15	30.8	1	.1	61	6.7	121	13.2
2	16	15.5	16	18.2	15	31.1	2	.2	62	6.8	122	13.3
3	16	15.8	16	18.5	15	31.3	3	.3	63	6.9	123	13.4
4	16	16.0	16	18.7	15	31.5	4	.4	64	7.0	124	13.5
5	16	16.3	16	19.0	15	31.8	5	.5	65	7.1	125	13.6
6	16	16.5	16	19.2	15	32.0	6	.7	66	7.2	126	13.8
7	16	16.8	16	19.5	15	32.3	7	.8	67	7.3	127	13.9
8	16	17.0	16	19.7	15	32.5	8	.9	68	7.4	128	14.0
9	16	17.3	16	20.0	15	32.7	9	1.0	69	7.5	129	14.1
10	16	17.5	16	20.2	15	33.0	10	1.1	70	7.6	130	14.2
11	16	17.8	16	20.5	15	33.2	11	1.2	71	7.8	131	14.3
12	16	18.0	16	20.7	15	33.4	12	1.3	72	7.9	132	14.4
13	16	18.3	16	21.0	15	33.7	13	1.4	73	8.0	133	14.5
14	16	18.5	16	21.2	15	33.9	14	1.5	74	8.1	134	14.6
15	16	18.8	16	21.5	15	34.2	15	1.6	75	8.2	135	14.7
16	16	19.0	16	21.7	15	34.4	16	1.7	76	8.3	136	14.8
17	16	19.3	16	22.0	15	34.6	17	1.9	77	8.4	137	15.0
18	16	19.5	16	22.2	15	34.9	18	2.0	78	8.5	138	15.1
19	16	19.8	16	22.5	15	35.1	19	2.1	79	8.6	139	15.2
20	16	20.0	16	22.7	15	35.4	20	2.2	80	8.7	140	15.3
21	16	20.3	16	23.0	15	35.6	21	2.3	81	8.8	141	15.4
22	16	20.5	16	23.2	15	35.8	22	2.4	82	9.0	142	15.5
23	16	20.8	16	23.5	15	36.1	23	2.5	83	9.1	143	15.6
24	16	21.0	16	23.7	15	36.3	24	2.6	84	9.2	144	15.7
25	16	21.3	16	24.0	15	36.5	25	2.7	85	9.3	145	15.8
26	16	21.5	16	24.2	15	36.8	26	2.8	86	9.4	146	15.9
27	16	21.8	16	24.5	15	37.0	27	2.9	87	9.5	147	16.0
28	16	22.0	16	24.7	15	37.3	28	3.1	88	9.6	148	16.2
29	16	22.3	16	25.0	15	37.5	29	3.2	89	9.7	149	16.3
30	16	22.5	16	25.2	15	37.7	30	3.3	90	9.8	150	16.4
31	16	22.8	16	25.5	15	38.0	31	3.4	91	9.9	151	16.5
32	16	23.0	16	25.7	15	38.2	32	3.5	92	10.0	152	16.6
33	16	23.3	16	26.0	15	38.5	33	3.6	93	10.2	153	16.7
34	16	23.5	16	26.2	15	38.7	34	3.7	94	10.3	154	16.8
35	16	23.8	16	26.5	15	38.9	35	3.8	95	10.4	155	16.9
36	16	24.0	16	26.7	15	39.2	36	3.9	96	10.5	156	17.0
37	16	24.3	16	27.0	15	39.4	37	4.0	97	10.6	157	17.1
38	16	24.5	16	27.2	15	39.7	38	4.1	98	10.7	158	17.2
39	16	24.8	16	27.5	15	39.9	39	4.3	99	10.8	159	17.4
40	16	25.0	16	27.7	15	40.1	40	4.4	100	10.9	160	17.5
41	16	25.3	16	28.0	15	40.4	41	4.5	101	11.0	161	17.6
42	16	25.5	16	28.2	15	40.6	42	4.6	102	11.1	162	17.7
43	16	25.8	16	28.5	15	40.8	43	4.7	103	11.2	163	17.8
44	16	26.0	16	28.7	15	41.1	44	4.8	104	11.4	164	17.9
45	16	26.3	16	29.0	15	41.3	45	4.9	105	11.5	165	18.0
46	16	26.5	16	29.2	15	41.6	46	5.0	106	11.6	166	18.1
47	16	26.8	16	29.5	15	41.8	47	5.1	107	11.7	167	18.2
48	16	27.0	16	29.7	15	42.0	48	5.2	108	11.8	168	18.3
49	16	27.3	16	30.0	15	42.3	49	5.3	109	11.9	169	18.4
50	16	27.5	16	30.2	15	42.5	50	5.5	110	12.0	170	18.6
51	16	27.8	16	30.5	15	42.8	51	5.6	111	12.1	171	18.7
52	16	28.0	16	30.7	15	43.0	52	5.7	112	12.2	172	18.8
53	16	28.3	16	31.0	15	43.2	53	5.8	113	12.3	173	18.9
54	16	28.5	16	31.2	15	43.5	54	5.9	114	12.4	174	19.0
55	16	28.8	16	31.5	15	43.7	55	6.0	115	12.6	175	19.1
56	16	29.0	16	31.7	15	43.9	56	6.1	116	12.7	176	19.2
57	16	29.3	16	32.0	15	44.2	57	6.2	117	12.8	177	19.3
58	16	29.5	16	32.2	15	44.4	58	6.3	118	12.9	178	19.4
59	16	29.8	16	32.5	15	44.7	59	6.4	119	13.0	179	19.5
60	16	30.0	16	32.8	15	44.9	60	6.6	120	13.1	180	19.7

1 h 6 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	16 30.0	16 32.8	15 44.9	0	.0	60	6.7	120	13.3
1	16 30.3	16 33.0	15 45.1	1	.1	61	6.8	121	13.4
2	16 30.5	16 33.3	15 45.4	2	.2	62	6.9	122	13.5
3	16 30.8	16 33.5	15 45.6	3	.3	63	7.0	123	13.6
4	16 31.0	16 33.8	15 45.9	4	.4	64	7.1	124	13.7
5	16 31.3	16 34.0	15 46.1	5	.6	65	7.2	125	13.9
6	16 31.5	16 34.3	15 46.3	6	.7	66	7.3	126	14.0
7	16 31.8	16 34.5	15 46.6	7	.8	67	7.4	127	14.1
8	16 32.0	16 34.8	15 46.8	8	.9	68	7.5	128	14.2
9	16 32.3	16 35.0	15 47.0	9	1.0	69	7.6	129	14.3
10	16 32.5	16 35.3	15 47.3	10	1.1	70	7.8	130	14.4
11	16 32.8	16 35.5	15 47.5	11	1.2	71	7.9	131	14.5
12	16 33.0	16 35.8	15 47.8	12	1.3	72	8.0	132	14.6
13	16 33.3	16 36.0	15 48.0	13	1.4	73	8.1	133	14.7
14	16 33.5	16 36.3	15 48.2	14	1.6	74	8.2	134	14.9
15	16 33.8	16 36.5	15 48.5	15	1.7	75	8.3	135	15.0
16	16 34.0	16 36.8	15 48.7	16	1.8	76	8.4	136	15.1
17	16 34.3	16 37.0	15 49.0	17	1.9	77	8.5	137	15.2
18	16 34.5	16 37.3	15 49.2	18	2.0	78	8.6	138	15.3
19	16 34.8	16 37.5	15 49.4	19	2.1	79	8.8	139	15.4
20	16 35.0	16 37.8	15 49.7	20	2.2	80	8.9	140	15.5
21	16 35.3	16 38.0	15 49.9	21	2.3	81	9.0	141	15.6
22	16 35.5	16 38.3	15 50.1	22	2.4	82	9.1	142	15.7
23	16 35.8	16 38.5	15 50.4	23	2.5	83	9.2	143	15.8
24	16 36.0	16 38.8	15 50.6	24	2.7	84	9.3	144	16.0
25	16 36.3	16 39.0	15 50.9	25	2.8	85	9.4	145	16.1
26	16 36.5	16 39.3	15 51.1	26	2.9	86	9.5	146	16.2
27	16 36.8	16 39.5	15 51.3	27	3.0	87	9.6	147	16.3
28	16 37.0	16 39.8	15 51.6	28	3.1	88	9.8	148	16.4
29	16 37.3	16 40.0	15 51.8	29	3.2	89	9.9	149	16.5
30	16 37.5	16 40.3	15 52.1	30	3.3	90	10.0	150	16.6
31	16 37.8	16 40.5	15 52.3	31	3.4	91	10.1	151	16.7
32	16 38.0	16 40.8	15 52.5	32	3.5	92	10.2	152	16.8
33	16 38.3	16 41.0	15 52.8	33	3.7	93	10.3	153	17.0
34	16 38.5	16 41.3	15 53.0	34	3.8	94	10.4	154	17.1
35	16 38.8	16 41.5	15 53.3	35	3.9	95	10.5	155	17.2
36	16 39.0	16 41.8	15 53.5	36	4.0	96	10.6	156	17.3
37	16 39.3	16 42.0	15 53.7	37	4.1	97	10.8	157	17.4
38	16 39.5	16 42.3	15 54.0	38	4.2	98	10.9	158	17.5
39	16 39.8	16 42.5	15 54.2	39	4.3	99	11.0	159	17.6
40	16 40.0	16 42.8	15 54.4	40	4.4	100	11.1	160	17.7
41	16 40.3	16 43.0	15 54.7	41	4.5	101	11.2	161	17.8
42	16 40.5	16 43.3	15 54.9	42	4.7	102	11.3	162	18.0
43	16 40.8	16 43.5	15 55.2	43	4.8	103	11.4	163	18.1
44	16 41.0	16 43.8	15 55.4	44	4.9	104	11.5	164	18.2
45	16 41.3	16 44.0	15 55.6	45	5.0	105	11.6	165	18.3
46	16 41.5	16 44.3	15 55.9	46	5.1	106	11.7	166	18.4
47	16 41.8	16 44.5	15 56.1	47	5.2	107	11.9	167	18.5
48	16 42.0	16 44.8	15 56.4	48	5.3	108	12.0	168	18.6
49	16 42.3	16 45.0	15 56.6	49	5.4	109	12.1	169	18.7
50	16 42.5	16 45.3	15 56.8	50	5.5	110	12.2	170	18.8
51	16 42.8	16 45.5	15 57.1	51	5.7	111	12.3	171	19.0
52	16 43.0	16 45.8	15 57.3	52	5.8	112	12.4	172	19.1
53	16 43.3	16 46.0	15 57.5	53	5.9	113	12.5	173	19.2
54	16 43.5	16 46.3	15 57.8	54	6.0	114	12.6	174	19.3
55	16 43.8	16 46.5	15 58.0	55	6.1	115	12.7	175	19.4
56	16 44.0	16 46.8	15 58.3	56	6.2	116	12.9	176	19.5
57	16 44.3	16 47.0	15 58.5	57	6.3	117	13.0	177	19.6
58	16 44.5	16 47.3	15 58.7	58	6.4	118	13.1	178	19.7
59	16 44.8	16 47.5	15 59.0	59	6.5	119	13.2	179	19.8
60	16 45.0	16 47.8	15 59.2	60	6.7	120	13.3	180	20.0

1 h 7 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	16 45.0	16 47.8	15 59.2	0	.0	60	6.8	120	13.5
1	16 45.3	16 48.0	15 59.5	1	.1	61	6.9	121	13.6
2	16 45.5	16 48.3	15 59.7	2	.2	62	7.0	122	13.7
3	16 45.8	16 48.5	15 59.9	3	.3	63	7.1	123	13.8
4	16 46.0	16 48.8	16 .2	4	.5	64	7.2	124	14.0
5	16 46.3	16 49.0	16 .4	5	.6	65	7.3	125	14.1
6	16 46.5	16 49.3	16 .6	6	.7	66	7.4	126	14.2
7	16 46.8	16 49.5	16 .9	7	.8	67	7.5	127	14.3
8	16 47.0	16 49.8	16 1.1	8	.9	68	7.7	128	14.4
9	16 47.3	16 50.0	16 1.4	9	1.0	69	7.8	129	14.5
10	16 47.5	16 50.3	16 1.6	10	1.1	70	7.9	130	14.6
11	16 47.8	16 50.5	16 1.8	11	1.2	71	8.0	131	14.7
12	16 48.0	16 50.8	16 2.1	12	1.4	72	8.1	132	14.9
13	16 48.3	16 51.1	16 2.3	13	1.5	73	8.2	133	15.0
14	16 48.5	16 51.3	16 2.6	14	1.6	74	8.3	134	15.1
15	16 48.8	16 51.6	16 2.8	15	1.7	75	8.4	135	15.2
16	16 49.0	16 51.8	16 3.0	16	1.8	76	8.6	136	15.3
17	16 49.3	16 52.1	16 3.3	17	1.9	77	8.7	137	15.4
18	16 49.5	16 52.3	16 3.5	18	2.0	78	8.8	138	15.5
19	16 49.8	16 52.6	16 3.8	19	2.1	79	8.9	139	15.6
20	16 50.0	16 52.8	16 4.0	20	2.3	80	9.0	140	15.8
21	16 50.3	16 53.1	16 4.2	21	2.4	81	9.1	141	15.9
22	16 50.5	16 53.3	16 4.5	22	2.5	82	9.2	142	16.0
23	16 50.8	16 53.6	16 4.7	23	2.6	83	9.3	143	16.1
24	16 51.0	16 53.8	16 4.9	24	2.7	84	9.5	144	16.2
25	16 51.3	16 54.1	16 5.2	25	2.8	85	9.6	145	16.3
26	16 51.5	16 54.3	16 5.4	26	2.9	86	9.7	146	16.4
27	16 51.8	16 54.6	16 5.7	27	3.0	87	9.8	147	16.5
28	16 52.0	16 54.8	16 5.9	28	3.2	88	9.9	148	16.7
29	16 52.3	16 55.1	16 6.1	29	3.3	89	10.0	149	16.8
30	16 52.5	16 55.3	16 6.4	30	3.4	90	10.1	150	16.9
31	16 52.8	16 55.6	16 6.6	31	3.5	91	10.2	151	17.0
32	16 53.0	16 55.8	16 6.9	32	3.6	92	10.4	152	17.1
33	16 53.3	16 56.1	16 7.1	33	3.7	93	10.5	153	17.2
34	16 53.5	16 56.3	16 7.3	34	3.8	94	10.6	154	17.3
35	16 53.8	16 56.6	16 7.6	35	3.9	95	10.7	155	17.4
36	16 54.0	16 56.8	16 7.8	36	4.1	96	10.8	156	17.6
37	16 54.3	16 57.1	16 8.0	37	4.2	97	10.9	157	17.7
38	16 54.5	16 57.3	16 8.3	38	4.3	98	11.0	158	17.8
39	16 54.8	16 57.6	16 8.5	39	4.4	99	11.1	159	17.9
40	16 55.0	16 57.8	16 8.8	40	4.5	100	11.3	160	18.0
41	16 55.3	16 58.1	16 9.0	41	4.6	101	11.4	161	18.1
42	16 55.5	16 58.3	16 9.2	42	4.7	102	11.5	162	18.2
43	16 55.8	16 58.6	16 9.5	43	4.8	103	11.6	163	18.3
44	16 56.0	16 58.8	16 9.7	44	5.0	104	11.7	164	18.5
45	16 56.3	16 59.1	16 10.0	45	5.1	105	11.8	165	18.6
46	16 56.5	16 59.3	16 10.2	46	5.2	106	11.9	166	18.7
47	16 56.8	16 59.6	16 10.4	47	5.3	107	12.0	167	18.8
48	16 57.0	16 59.8	16 10.7	48	5.4	108	12.2	168	18.9
49	16 57.3	17 .1	16 10.9	49	5.5	109	12.3	169	19.0
50	16 57.5	17 .3	16 11.1	50	5.6	110	12.4	170	19.1
51	16 57.8	17 .6	16 11.4	51	5.7	111	12.5	171	19.2
52	16 58.0	17 .8	16 11.6	52	5.9	112	12.6	172	19.4
53	16 58.3	17 1.1	16 11.9	53	6.0	113	12.7	173	19.5
54	16 58.5	17 1.3	16 12.1	54	6.1	114	12.8	174	19.6
55	16 58.8	17 1.6	16 12.3	55	6.2	115	12.9	175	19.7
56	16 59.0	17 1.8	16 12.6	56	6.3	116	13.1	176	19.8
57	16 59.3	17 2.1	16 12.8	57	6.4	117	13.2	177	19.9
58	16 59.5	17 2.3	16 13.1	58	6.5	118	13.3	178	20.0
59	16 59.8	17 2.6	16 13.3	59	6.6	119	13.4	179	20.1
60	17 .0	17 2.8	16 13.5	60	6.8	120	13.5	180	20.3

1 h 8 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 .0	17 2.8	16 13.5	0	.0	60	6.9	120	13.7
1	17 .3	17 3.1	16 13.8	1	.1	61	7.0	121	13.8
2	17 .5	17 3.3	16 14.0	2	.2	62	7.1	122	13.9
3	17 .8	17 3.6	16 14.2	3	.3	63	7.2	123	14.0
4	17 1.0	17 3.8	16 14.5	4	.5	64	7.3	124	14.2
5	17 1.3	17 4.1	16 14.7	5	.6	65	7.4	125	14.3
6	17 1.5	17 4.3	16 15.0	6	.7	66	7.5	126	14.4
7	17 1.8	17 4.6	16 15.2	7	.8	67	7.6	127	14.5
8	17 2.0	17 4.8	16 15.4	8	.9	68	7.8	128	14.6
9	17 2.3	17 5.1	16 15.7	9	1.0	69	7.9	129	14.7
10	17 2.5	17 5.3	16 15.9	10	1.1	70	8.0	130	14.8
11	17 2.8	17 5.6	16 16.2	11	1.3	71	8.1	131	15.0
12	17 3.0	17 5.8	16 16.4	12	1.4	72	8.2	132	15.1
13	17 3.3	17 6.1	16 16.6	13	1.5	73	8.3	133	15.2
14	17 3.5	17 6.3	16 16.9	14	1.6	74	8.4	134	15.3
15	17 3.8	17 6.6	16 17.1	15	1.7	75	8.6	135	15.4
16	17 4.0	17 6.8	16 17.4	16	1.8	76	8.7	136	15.5
17	17 4.3	17 7.1	16 17.6	17	1.9	77	8.8	137	15.6
18	17 4.5	17 7.3	16 17.8	18	2.1	78	8.9	138	15.8
19	17 4.8	17 7.6	16 18.1	19	2.2	79	9.0	139	15.9
20	17 5.0	17 7.8	16 18.3	20	2.3	80	9.1	140	16.0
21	17 5.3	17 8.1	16 18.5	21	2.4	81	9.2	141	16.1
22	17 5.5	17 8.3	16 18.8	22	2.5	82	9.4	142	16.2
23	17 5.8	17 8.6	16 19.0	23	2.6	83	9.5	143	16.3
24	17 6.0	17 8.9	16 19.3	24	2.7	84	9.6	144	16.4
25	17 6.3	17 9.1	16 19.5	25	2.9	85	9.7	145	16.6
26	17 6.5	17 9.4	16 19.7	26	3.0	86	9.8	146	16.7
27	17 6.8	17 9.6	16 20.0	27	3.1	87	9.9	147	16.8
28	17 7.0	17 9.9	16 20.2	28	3.2	88	10.0	148	16.9
29	17 7.3	17 10.1	16 20.5	29	3.3	89	10.2	149	17.0
30	17 7.5	17 10.4	16 20.7	30	3.4	90	10.3	150	17.1
31	17 7.8	17 10.6	16 20.9	31	3.5	91	10.4	151	17.2
32	17 8.0	17 10.9	16 21.2	32	3.7	92	10.5	152	17.4
33	17 8.3	17 11.1	16 21.4	33	3.8	93	10.6	153	17.5
34	17 8.5	17 11.4	16 21.6	34	3.9	94	10.7	154	17.6
35	17 8.8	17 11.6	16 21.9	35	4.0	95	10.8	155	17.7
36	17 9.0	17 11.9	16 22.1	36	4.1	96	11.0	156	17.8
37	17 9.3	17 12.1	16 22.4	37	4.2	97	11.1	157	17.9
38	17 9.5	17 12.4	16 22.6	38	4.3	98	11.2	158	18.0
39	17 9.8	17 12.6	16 22.8	39	4.5	99	11.3	159	18.2
40	17 10.0	17 12.9	16 23.1	40	4.6	100	11.4	160	18.3
41	17 10.3	17 13.1	16 23.3	41	4.7	101	11.5	161	18.4
42	17 10.5	17 13.4	16 23.6	42	4.8	102	11.6	162	18.5
43	17 10.8	17 13.6	16 23.8	43	4.9	103	11.8	163	18.6
44	17 11.0	17 13.9	16 24.0	44	5.0	104	11.9	164	18.7
45	17 11.3	17 14.1	16 24.3	45	5.1	105	12.0	165	18.8
46	17 11.5	17 14.4	16 24.5	46	5.3	106	12.1	166	19.0
47	17 11.8	17 14.6	16 24.7	47	5.4	107	12.2	167	19.1
48	17 12.0	17 14.9	16 25.0	48	5.5	108	12.3	168	19.2
49	17 12.3	17 15.1	16 25.2	49	5.6	109	12.4	169	19.3
50	17 12.5	17 15.4	16 25.5	50	5.7	110	12.6	170	19.4
51	17 12.8	17 15.6	16 25.7	51	5.8	111	12.7	171	19.5
52	17 13.0	17 15.9	16 25.9	52	5.9	112	12.8	172	19.6
53	17 13.3	17 16.1	16 26.2	53	6.1	113	12.9	173	19.8
54	17 13.5	17 16.4	16 26.4	54	6.2	114	13.0	174	19.9
55	17 13.8	17 16.6	16 26.7	55	6.3	115	13.1	175	20.0
56	17 14.0	17 16.9	16 26.9	56	6.4	116	13.2	176	20.1
57	17 14.3	17 17.1	16 27.1	57	6.5	117	13.4	177	20.2
58	17 14.5	17 17.4	16 27.4	58	6.6	118	13.5	178	20.3
59	17 14.8	17 17.6	16 27.6	59	6.7	119	13.6	179	20.4
60	17 15.0	17 17.9	16 27.9	60	6.9	120	13.7	180	20.6

1 h 9 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 15.0	17 17.9	16 27.9	0	.0	60	7.0	120	13.9
1	17 15.3	17 18.1	16 28.1	1	.1	61	7.1	121	14.0
2	17 15.5	17 18.4	16 28.3	2	.2	62	7.2	122	14.1
3	17 15.8	17 18.6	16 28.6	3	.3	63	7.3	123	14.2
4	17 16.0	17 18.9	16 28.8	4	.5	64	7.4	124	14.4
5	17 16.3	17 19.1	16 29.0	5	.6	65	7.5	125	14.5
6	17 16.5	17 19.4	16 29.3	6	.7	66	7.6	126	14.6
7	17 16.8	17 19.6	16 29.5	7	.8	67	7.8	127	14.7
8	17 17.0	17 19.9	16 29.8	8	.9	68	7.9	128	14.8
9	17 17.3	17 20.1	16 30.0	9	1.0	69	8.0	129	14.9
10	17 17.5	17 20.4	16 30.2	10	1.2	70	8.1	130	15.1
11	17 17.8	17 20.6	16 30.5	11	1.3	71	8.2	131	15.2
12	17 18.0	17 20.9	16 30.7	12	1.4	72	8.3	132	15.3
13	17 18.3	17 21.1	16 31.0	13	1.5	73	8.5	133	15.4
14	17 18.5	17 21.4	16 31.2	14	1.6	74	8.6	134	15.5
15	17 18.8	17 21.6	16 31.4	15	1.7	75	8.7	135	15.6
16	17 19.0	17 21.9	16 31.7	16	1.9	76	8.8	136	15.8
17	17 19.3	17 22.1	16 31.9	17	2.0	77	8.9	137	15.9
18	17 19.5	17 22.4	16 32.1	18	2.1	78	9.0	138	16.0
19	17 19.8	17 22.6	16 32.4	19	2.2	79	9.2	139	16.1
20	17 20.0	17 22.9	16 32.6	20	2.3	80	9.3	140	16.2
21	17 20.3	17 23.1	16 32.9	21	2.4	81	9.4	141	16.3
22	17 20.5	17 23.4	16 33.1	22	2.5	82	9.5	142	16.4
23	17 20.8	17 23.6	16 33.3	23	2.7	83	9.6	143	16.6
24	17 21.0	17 23.9	16 33.6	24	2.8	84	9.7	144	16.7
25	17 21.3	17 24.1	16 33.8	25	2.9	85	9.8	145	16.8
26	17 21.5	17 24.4	16 34.1	26	3.0	86	10.0	146	16.9
27	17 21.8	17 24.6	16 34.3	27	3.1	87	10.1	147	17.0
28	17 22.0	17 24.9	16 34.5	28	3.2	88	10.2	148	17.1
29	17 22.3	17 25.1	16 34.8	29	3.4	89	10.3	149	17.3
30	17 22.5	17 25.4	16 35.0	30	3.5	90	10.4	150	17.4
31	17 22.8	17 25.6	16 35.2	31	3.6	91	10.5	151	17.5
32	17 23.0	17 25.9	16 35.5	32	3.7	92	10.7	152	17.6
33	17 23.3	17 26.1	16 35.7	33	3.8	93	10.8	153	17.7
34	17 23.5	17 26.4	16 36.0	34	3.9	94	10.9	154	17.8
35	17 23.8	17 26.6	16 36.2	35	4.1	95	11.0	155	18.0
36	17 24.0	17 26.9	16 36.4	36	4.2	96	11.1	156	18.1
37	17 24.3	17 27.2	16 36.7	37	4.3	97	11.2	157	18.2
38	17 24.5	17 27.4	16 36.9	38	4.4	98	11.4	158	18.3
39	17 24.8	17 27.7	16 37.2	39	4.5	99	11.5	159	18.4
40	17 25.0	17 27.9	16 37.4	40	4.6	100	11.6	160	18.5
41	17 25.3	17 28.2	16 37.6	41	4.7	101	11.7	161	18.6
42	17 25.5	17 28.4	16 37.9	42	4.9	102	11.8	162	18.8
43	17 25.8	17 28.7	16 38.1	43	5.0	103	11.9	163	18.9
44	17 26.0	17 28.9	16 38.3	44	5.1	104	12.0	164	19.0
45	17 26.3	17 29.2	16 38.6	45	5.2	105	12.2	165	19.1
46	17 26.5	17 29.4	16 38.8	46	5.3	106	12.3	166	19.2
47	17 26.8	17 29.7	16 39.1	47	5.4	107	12.4	167	19.3
48	17 27.0	17 29.9	16 39.3	48	5.6	108	12.5	168	19.5
49	17 27.3	17 30.2	16 39.5	49	5.7	109	12.6	169	19.6
50	17 27.5	17 30.4	16 39.8	50	5.8	110	12.7	170	19.7
51	17 27.8	17 30.7	16 40.0	51	5.9	111	12.9	171	19.8
52	17 28.0	17 30.9	16 40.3	52	6.0	112	13.0	172	19.9
53	17 28.3	17 31.2	16 40.5	53	6.1	113	13.1	173	20.0
54	17 28.5	17 31.4	16 40.7	54	6.3	114	13.2	174	20.2
55	17 28.8	17 31.7	16 41.0	55	6.4	115	13.3	175	20.3
56	17 29.0	17 31.9	16 41.2	56	6.5	116	13.4	176	20.4
57	17 29.3	17 32.2	16 41.5	57	6.6	117	13.6	177	20.5
58	17 29.5	17 32.4	16 41.7	58	6.7	118	13.7	178	20.6
59	17 29.8	17 32.7	16 41.9	59	6.8	119	13.8	179	20.7
60	17 30.0	17 32.9	16 42.2	60	7.0	120	13.9	180	20.9

1 h 10 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 30.0	17 32.9	16 42.2	0	.0	60	7.1	120	14.1
1	17 30.3	17 33.2	16 42.4	1	.1	61	7.2	121	14.2
2	17 30.5	17 33.4	16 42.6	2	.2	62	7.3	122	14.3
3	17 30.8	17 33.7	16 42.9	3	.4	63	7.4	123	14.5
4	17 31.0	17 33.9	16 43.1	4	.5	64	7.5	124	14.6
5	17 31.3	17 34.2	16 43.4	5	.6	65	7.6	125	14.7
6	17 31.5	17 34.4	16 43.6	6	.7	66	7.8	126	14.8
7	17 31.8	17 34.7	16 43.8	7	.8	67	7.9	127	14.9
8	17 32.0	17 34.9	16 44.1	8	.9	68	8.0	128	15.0
9	17 32.3	17 35.2	16 44.3	9	1.1	69	8.1	129	15.2
10	17 32.5	17 35.4	16 44.6	10	1.2	70	8.2	130	15.3
11	17 32.8	17 35.7	16 44.8	11	1.3	71	8.3	131	15.4
12	17 33.0	17 35.9	16 45.0	12	1.4	72	8.5	132	15.5
13	17 33.3	17 36.2	16 45.3	13	1.5	73	8.6	133	15.6
14	17 33.5	17 36.4	16 45.5	14	1.6	74	8.7	134	15.7
15	17 33.8	17 36.7	16 45.7	15	1.8	75	8.8	135	15.9
16	17 34.0	17 36.9	16 46.0	16	1.9	76	8.9	136	16.0
17	17 34.3	17 37.2	16 46.2	17	2.0	77	9.0	137	16.1
18	17 34.5	17 37.4	16 46.5	18	2.1	78	9.2	138	16.2
19	17 34.8	17 37.7	16 46.7	19	2.2	79	9.3	139	16.3
20	17 35.0	17 37.9	16 46.9	20	2.4	80	9.4	140	16.5
21	17 35.3	17 38.2	16 47.2	21	2.5	81	9.5	141	16.6
22	17 35.5	17 38.4	16 47.4	22	2.6	82	9.6	142	16.7
23	17 35.8	17 38.7	16 47.7	23	2.7	83	9.8	143	16.8
24	17 36.0	17 38.9	16 47.9	24	2.8	84	9.9	144	16.9
25	17 36.3	17 39.2	16 48.1	25	2.9	85	10.0	145	17.0
26	17 36.5	17 39.4	16 48.4	26	3.1	86	10.1	146	17.2
27	17 36.8	17 39.7	16 48.6	27	3.2	87	10.2	147	17.3
28	17 37.0	17 39.9	16 48.8	28	3.3	88	10.3	148	17.4
29	17 37.3	17 40.2	16 49.1	29	3.4	89	10.5	149	17.5
30	17 37.5	17 40.4	16 49.3	30	3.5	90	10.6	150	17.6
31	17 37.8	17 40.7	16 49.6	31	3.6	91	10.7	151	17.7
32	17 38.0	17 40.9	16 49.8	32	3.8	92	10.8	152	17.9
33	17 38.3	17 41.2	16 50.0	33	3.9	93	10.9	153	18.0
34	17 38.5	17 41.4	16 50.3	34	4.0	94	11.0	154	18.1
35	17 38.8	17 41.7	16 50.5	35	4.1	95	11.2	155	18.2
36	17 39.0	17 41.9	16 50.8	36	4.2	96	11.3	156	18.3
37	17 39.3	17 42.2	16 51.0	37	4.3	97	11.4	157	18.4
38	17 39.5	17 42.4	16 51.2	38	4.5	98	11.5	158	18.6
39	17 39.8	17 42.7	16 51.5	39	4.6	99	11.6	159	18.7
40	17 40.0	17 42.9	16 51.7	40	4.7	100	11.8	160	18.8
41	17 40.3	17 43.2	16 51.9	41	4.8	101	11.9	161	18.9
42	17 40.5	17 43.4	16 52.2	42	4.9	102	12.0	162	19.0
43	17 40.8	17 43.7	16 52.4	43	5.1	103	12.1	163	19.2
44	17 41.0	17 43.9	16 52.7	44	5.2	104	12.2	164	19.3
45	17 41.3	17 44.2	16 52.9	45	5.3	105	12.3	165	19.4
46	17 41.5	17 44.4	16 53.1	46	5.4	106	12.5	166	19.5
47	17 41.8	17 44.7	16 53.4	47	5.5	107	12.6	167	19.6
48	17 42.0	17 45.0	16 53.6	48	5.6	108	12.7	168	19.7
49	17 42.3	17 45.2	16 53.9	49	5.8	109	12.8	169	19.9
50	17 42.5	17 45.5	16 54.1	50	5.9	110	12.9	170	20.0
51	17 42.8	17 45.7	16 54.3	51	6.0	111	13.0	171	20.1
52	17 43.0	17 46.0	16 54.6	52	6.1	112	13.2	172	20.2
53	17 43.3	17 46.2	16 54.8	53	6.2	113	13.3	173	20.3
54	17 43.5	17 46.5	16 55.1	54	6.3	114	13.4	174	20.4
55	17 43.8	17 46.7	16 55.3	55	6.5	115	13.5	175	20.6
56	17 44.0	17 47.0	16 55.5	56	6.6	116	13.6	176	20.7
57	17 44.3	17 47.2	16 55.8	57	6.7	117	13.7	177	20.8
58	17 44.5	17 47.5	16 56.0	58	6.8	118	13.9	178	20.9
59	17 44.8	17 47.7	16 56.2	59	6.9	119	14.0	179	21.0
60	17 45.0	17 48.0	16 56.5	60	7.1	120	14.1	180	21.2

1 h 11 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	17 45.0	17 48.0	16 56.5	0	.0	60	7.2	120	14.3
1	17 45.3	17 48.2	16 56.7	1	.1	61	7.3	121	14.4
2	17 45.5	17 48.5	16 57.0	2	.2	62	7.4	122	14.5
3	17 45.8	17 48.7	16 57.2	3	.4	63	7.5	123	14.7
4	17 46.0	17 49.0	16 57.4	4	.5	64	7.6	124	14.8
5	17 46.3	17 49.2	16 57.7	5	.6	65	7.7	125	14.9
6	17 46.5	17 49.5	16 57.9	6	.7	66	7.9	126	15.0
7	17 46.8	17 49.7	16 58.2	7	.8	67	8.0	127	15.1
8	17 47.0	17 50.0	16 58.4	8	1.0	68	8.1	128	15.3
9	17 47.3	17 50.2	16 58.6	9	1.1	69	8.2	129	15.4
10	17 47.5	17 50.5	16 58.9	10	1.2	70	8.3	130	15.5
11	17 47.8	17 50.7	16 59.1	11	1.3	71	8.5	131	15.6
12	17 48.0	17 51.0	16 59.3	12	1.4	72	8.6	132	15.7
13	17 48.3	17 51.2	16 59.6	13	1.5	73	8.7	133	15.8
14	17 48.5	17 51.5	16 59.8	14	1.7	74	8.8	134	16.0
15	17 48.8	17 51.7	17 .1	15	1.8	75	8.9	135	16.1
16	17 49.0	17 52.0	17 .3	16	1.9	76	9.1	136	16.2
17	17 49.3	17 52.2	17 .5	17	2.0	77	9.2	137	16.3
18	17 49.5	17 52.5	17 .8	18	2.1	78	9.3	138	16.4
19	17 49.8	17 52.7	17 1.0	19	2.3	79	9.4	139	16.6
20	17 50.0	17 53.0	17 1.3	20	2.4	80	9.5	140	16.7
21	17 50.3	17 53.2	17 1.5	21	2.5	81	9.7	141	16.8
22	17 50.5	17 53.5	17 1.7	22	2.6	82	9.8	142	16.9
23	17 50.8	17 53.7	17 2.0	23	2.7	83	9.9	143	17.0
24	17 51.0	17 54.0	17 2.2	24	2.9	84	10.0	144	17.2
25	17 51.3	17 54.2	17 2.4	25	3.0	85	10.1	145	17.3
26	17 51.5	17 54.5	17 2.7	26	3.1	86	10.2	146	17.4
27	17 51.8	17 54.7	17 2.9	27	3.2	87	10.4	147	17.5
28	17 52.0	17 55.0	17 3.2	28	3.3	88	10.5	148	17.6
29	17 52.3	17 55.2	17 3.4	29	3.5	89	10.6	149	17.8
30	17 52.5	17 55.5	17 3.6	30	3.6	90	10.7	150	17.9
31	17 52.8	17 55.7	17 3.9	31	3.7	91	10.8	151	18.0
32	17 53.0	17 56.0	17 4.1	32	3.8	92	11.0	152	18.1
33	17 53.3	17 56.2	17 4.4	33	3.9	93	11.1	153	18.2
34	17 53.5	17 56.5	17 4.6	34	4.1	94	11.2	154	18.4
35	17 53.8	17 56.7	17 4.8	35	4.2	95	11.3	155	18.5
36	17 54.0	17 57.0	17 5.1	36	4.3	96	11.4	156	18.6
37	17 54.3	17 57.2	17 5.3	37	4.4	97	11.6	157	18.7
38	17 54.5	17 57.5	17 5.6	38	4.5	98	11.7	158	18.8
39	17 54.8	17 57.7	17 5.8	39	4.6	99	11.8	159	18.9
40	17 55.0	17 58.0	17 6.0	40	4.8	100	11.9	160	19.1
41	17 55.3	17 58.2	17 6.3	41	4.9	101	12.0	161	19.2
42	17 55.5	17 58.5	17 6.5	42	5.0	102	12.2	162	19.3
43	17 55.8	17 58.7	17 6.7	43	5.1	103	12.3	163	19.4
44	17 56.0	17 59.0	17 7.0	44	5.2	104	12.4	164	19.5
45	17 56.3	17 59.2	17 7.2	45	5.4	105	12.5	165	19.7
46	17 56.5	17 59.5	17 7.5	46	5.5	106	12.6	166	19.8
47	17 56.8	17 59.7	17 7.7	47	5.6	107	12.8	167	19.9
48	17 57.0	17 60.0	17 7.9	48	5.7	108	12.9	168	20.0
49	17 57.3	18 .2	17 8.2	49	5.8	109	13.0	169	20.1
50	17 57.5	18 .5	17 8.4	50	6.0	110	13.1	170	20.3
51	17 57.8	18 .7	17 8.7	51	6.1	111	13.2	171	20.4
52	17 58.0	18 1.0	17 8.9	52	6.2	112	13.3	172	20.5
53	17 58.3	18 1.2	17 9.1	53	6.3	113	13.5	173	20.6
54	17 58.5	18 1.5	17 9.4	54	6.4	114	13.6	174	20.7
55	17 58.8	18 1.7	17 9.6	55	6.6	115	13.7	175	20.9
56	17 59.0	18 2.0	17 9.8	56	6.7	116	13.8	176	21.0
57	17 59.3	18 2.2	17 10.1	57	6.8	117	13.9	177	21.1
58	17 59.5	18 2.5	17 10.3	58	6.9	118	14.1	178	21.2
59	17 59.8	18 2.7	17 10.6	59	7.0	119	14.2	179	21.3
60	18 .0	18 3.0	17 10.8	60	7.2	120	14.3	180	21.5

1 h 12 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	18	.0	18	3.0	17	10.8	0	.0	60	7.3	120	14.5
1	18	.3	18	3.3	17	11.0	1	.1	61	7.4	121	14.6
2	18	.5	18	3.5	17	11.3	2	.2	62	7.5	122	14.7
3	18	.8	18	3.8	17	11.5	3	.4	63	7.6	123	14.9
4	18	1.0	18	4.0	17	11.8	4	.5	64	7.7	124	15.0
5	18	1.3	18	4.3	17	12.0	5	.6	65	7.9	125	15.1
6	18	1.5	18	4.5	17	12.2	6	.7	66	8.0	126	15.2
7	18	1.8	18	4.8	17	12.5	7	.8	67	8.1	127	15.3
8	18	2.0	18	5.0	17	12.7	8	1.0	68	8.2	128	15.5
9	18	2.3	18	5.3	17	12.9	9	1.1	69	8.3	129	15.6
10	18	2.5	18	5.5	17	13.2	10	1.2	70	8.5	130	15.7
11	18	2.8	18	5.8	17	13.4	11	1.3	71	8.6	131	15.8
12	18	3.0	18	6.0	17	13.7	12	1.5	72	8.7	132	16.0
13	18	3.3	18	6.3	17	13.9	13	1.6	73	8.8	133	16.1
14	18	3.5	18	6.5	17	14.1	14	1.7	74	8.9	134	16.2
15	18	3.8	18	6.8	17	14.4	15	1.8	75	9.1	135	16.3
16	18	4.0	18	7.0	17	14.6	16	1.9	76	9.2	136	16.4
17	18	4.3	18	7.3	17	14.9	17	2.1	77	9.3	137	16.6
18	18	4.5	18	7.5	17	15.1	18	2.2	78	9.4	138	16.7
19	18	4.8	18	7.8	17	15.3	19	2.3	79	9.5	139	16.8
20	18	5.0	18	8.0	17	15.6	20	2.4	80	9.7	140	16.9
21	18	5.3	18	8.3	17	15.8	21	2.5	81	9.8	141	17.0
22	18	5.5	18	8.5	17	16.0	22	2.7	82	9.9	142	17.2
23	18	5.8	18	8.8	17	16.3	23	2.8	83	10.0	143	17.3
24	18	6.0	18	9.0	17	16.5	24	2.9	84	10.2	144	17.4
25	18	6.3	18	9.3	17	16.8	25	3.0	85	10.3	145	17.5
26	18	6.5	18	9.5	17	17.0	26	3.1	86	10.4	146	17.6
27	18	6.8	18	9.8	17	17.2	27	3.3	87	10.5	147	17.8
28	18	7.0	18	10.0	17	17.5	28	3.4	88	10.6	148	17.9
29	18	7.3	18	10.3	17	17.7	29	3.5	89	10.8	149	18.0
30	18	7.5	18	10.5	17	18.0	30	3.6	90	10.9	150	18.1
31	18	7.8	18	10.8	17	18.2	31	3.7	91	11.0	151	18.2
32	18	8.0	18	11.0	17	18.4	32	3.9	92	11.1	152	18.4
33	18	8.3	18	11.3	17	18.7	33	4.0	93	11.2	153	18.5
34	18	8.5	18	11.5	17	18.9	34	4.1	94	11.4	154	18.6
35	18	8.8	18	11.8	17	19.2	35	4.2	95	11.5	155	18.7
36	18	9.0	18	12.0	17	19.4	36	4.4	96	11.6	156	18.9
37	18	9.3	18	12.3	17	19.6	37	4.5	97	11.7	157	19.0
38	18	9.5	18	12.5	17	19.9	38	4.6	98	11.8	158	19.1
39	18	9.8	18	12.8	17	20.1	39	4.7	99	12.0	159	19.2
40	18	10.0	18	13.0	17	20.3	40	4.8	100	12.1	160	19.3
41	18	10.3	18	13.3	17	20.6	41	5.0	101	12.2	161	19.5
42	18	10.5	18	13.5	17	20.8	42	5.1	102	12.3	162	19.6
43	18	10.8	18	13.8	17	21.1	43	5.2	103	12.4	163	19.7
44	18	11.0	18	14.0	17	21.3	44	5.3	104	12.6	164	19.8
45	18	11.3	18	14.3	17	21.5	45	5.4	105	12.7	165	19.9
46	18	11.5	18	14.5	17	21.8	46	5.6	106	12.8	166	20.1
47	18	11.8	18	14.8	17	22.0	47	5.7	107	12.9	167	20.2
48	18	12.0	18	15.0	17	22.3	48	5.8	108	13.1	168	20.3
49	18	12.3	18	15.3	17	22.5	49	5.9	109	13.2	169	20.4
50	18	12.5	18	15.5	17	22.7	50	6.0	110	13.3	170	20.5
51	18	12.8	18	15.8	17	23.0	51	6.2	111	13.4	171	20.7
52	18	13.0	18	16.0	17	23.2	52	6.3	112	13.5	172	20.8
53	18	13.3	18	16.3	17	23.4	53	6.4	113	13.7	173	20.9
54	18	13.5	18	16.5	17	23.7	54	6.5	114	13.8	174	21.0
55	18	13.8	18	16.8	17	23.9	55	6.6	115	13.9	175	21.1
56	18	14.0	18	17.0	17	24.2	56	6.8	116	14.0	176	21.3
57	18	14.3	18	17.3	17	24.4	57	6.9	117	14.1	177	21.4
58	18	14.5	18	17.5	17	24.6	58	7.0	118	14.3	178	21.5
59	18	14.8	18	17.8	17	24.9	59	7.1	119	14.4	179	21.6
60	18	15.0	18	18.0	17	25.1	60	7.3	120	14.5	180	21.8

1 h 13 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	18	15.0	18	18.0	17	25.1	0	.0	60	7.4	120	14.7
1	18	15.3	18	18.3	17	25.4	1	.1	61	7.5	121	14.8
2	18	15.5	18	18.5	17	25.6	2	.2	62	7.6	122	14.9
3	18	15.8	18	18.8	17	25.8	3	.4	63	7.7	123	15.1
4	18	16.0	18	19.0	17	26.1	4	.5	64	7.8	124	15.2
5	18	16.3	18	19.3	17	26.3	5	.6	65	8.0	125	15.3
6	18	16.5	18	19.5	17	26.5	6	.7	66	8.1	126	15.4
7	18	16.8	18	19.8	17	26.8	7	.9	67	8.2	127	15.6
8	18	17.0	18	20.0	17	27.0	8	1.0	68	8.3	128	15.7
9	18	17.3	18	20.3	17	27.3	9	1.1	69	8.5	129	15.8
10	18	17.5	18	20.5	17	27.5	10	1.2	70	8.6	130	15.9
11	18	17.8	18	20.8	17	27.7	11	1.3	71	8.7	131	16.0
12	18	18.0	18	21.1	17	28.0	12	1.5	72	8.8	132	16.2
13	18	18.3	18	21.3	17	28.2	13	1.6	73	8.9	133	16.3
14	18	18.5	18	21.6	17	28.5	14	1.7	74	9.1	134	16.4
15	18	18.8	18	21.8	17	28.7	15	1.8	75	9.2	135	16.5
16	18	19.0	18	22.1	17	28.9	16	2.0	76	9.3	136	16.7
17	18	19.3	18	22.3	17	29.2	17	2.1	77	9.4	137	16.8
18	18	19.5	18	22.6	17	29.4	18	2.2	78	9.6	138	16.9
19	18	19.8	18	22.8	17	29.7	19	2.3	79	9.7	139	17.0
20	18	20.0	18	23.1	17	29.9	20	2.5	80	9.8	140	17.2
21	18	20.3	18	23.3	17	30.1	21	2.6	81	9.9	141	17.3
22	18	20.5	18	23.6	17	30.4	22	2.7	82	10.0	142	17.4
23	18	20.8	18	23.8	17	30.6	23	2.8	83	10.2	143	17.5
24	18	21.0	18	24.1	17	30.8	24	2.9	84	10.3	144	17.6
25	18	21.3	18	24.3	17	31.1	25	3.1	85	10.4	145	17.8
26	18	21.5	18	24.6	17	31.3	26	3.2	86	10.5	146	17.9
27	18	21.8	18	24.8	17	31.6	27	3.3	87	10.7	147	18.0
28	18	22.0	18	25.1	17	31.8	28	3.4	88	10.8	148	18.1
29	18	22.3	18	25.3	17	32.0	29	3.6	89	10.9	149	18.3
30	18	22.5	18	25.6	17	32.3	30	3.7	90	11.0	150	18.4
31	18	22.8	18	25.8	17	32.5	31	3.8	91	11.1	151	18.5
32	18	23.0	18	26.1	17	32.8	32	3.9	92	11.3	152	18.6
33	18	23.3	18	26.3	17	33.0	33	4.0	93	11.4	153	18.7
34	18	23.5	18	26.6	17	33.2	34	4.2	94	11.5	154	18.9
35	18	23.8	18	26.8	17	33.5	35	4.3	95	11.6	155	19.0
36	18	24.0	18	27.1	17	33.7	36	4.4	96	11.8	156	19.1
37	18	24.3	18	27.3	17	33.9	37	4.5	97	11.9	157	19.2
38	18	24.5	18	27.6	17	34.2	38	4.7	98	12.0	158	19.4
39	18	24.8	18	27.8	17	34.4	39	4.8	99	12.1	159	19.5
40	18	25.0	18	28.1	17	34.7	40	4.9	100	12.3	160	19.6
41	18	25.3	18	28.3	17	34.9	41	5.0	101	12.4	161	19.7
42	18	25.5	18	28.6	17	35.1	42	5.1	102	12.5	162	19.8
43	18	25.8	18	28.8	17	35.4	43	5.3	103	12.6	163	20.0
44	18	26.0	18	29.1	17	35.6	44	5.4	104	12.7	164	20.1
45	18	26.3	18	29.3	17	35.9	45	5.5	105	12.9	165	20.2
46	18	26.5	18	29.6	17	36.1	46	5.6	106	13.0	166	20.3
47	18	26.8	18	29.8	17	36.3	47	5.8	107	13.1	167	20.5
48	18	27.0	18	30.1	17	36.6	48	5.9	108	13.2	168	20.6
49	18	27.3	18	30.3	17	36.8	49	6.0	109	13.4	169	20.7
50	18	27.5	18	30.6	17	37.0	50	6.1	110	13.5	170	20.8
51	18	27.8	18	30.8	17	37.3	51	6.2	111	13.6	171	20.9
52	18	28.0	18	31.1	17	37.5	52	6.4	112	13.7	172	21.1
53	18	28.3	18	31.3	17	37.8	53	6.5	113	13.8	173	21.2
54	18	28.5	18	31.6	17	38.0	54	6.6	114	14.0	174	21.3
55	18	28.8	18	31.8	17	38.2	55	6.7	115	14.1	175	21.4
56	18	29.0	18	32.1	17	38.5	56	6.9	116	14.2	176	21.6
57	18	29.3	18	32.3	17	38.7	57	7.0	117	14.3	177	21.7
58	18	29.5	18	32.6	17	39.0	58	7.1	118	14.5	178	21.8
59	18	29.8	18	32.8	17	39.2	59	7.2	119	14.6	179	21.9
60	18	30.0	18	33.1	17	39.4	60	7.4	120	14.7	180	22.1

1 h 14 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	18 30.0	18 33.1	17 39.4	0	.0	60	7.5	120	14.9
1	18 30.3	18 33.3	17 39.7	1	.1	61	7.6	121	15.0
2	18 30.5	18 33.6	17 39.9	2	.2	62	7.7	122	15.1
3	18 30.8	18 33.8	17 40.1	3	.4	63	7.8	123	15.3
4	18 31.0	18 34.1	17 40.4	4	.5	64	7.9	124	15.4
5	18 31.3	18 34.3	17 40.6	5	.6	65	8.1	125	15.5
6	18 31.5	18 34.6	17 40.9	6	.7	66	8.2	126	15.6
7	18 31.8	18 34.8	17 41.1	7	.9	67	8.3	127	15.8
8	18 32.0	18 35.1	17 41.3	8	1.0	68	8.4	128	15.9
9	18 32.3	18 35.3	17 41.6	9	1.1	69	8.6	129	16.0
10	18 32.5	18 35.6	17 41.8	10	1.2	70	8.7	130	16.1
11	18 32.8	18 35.8	17 42.1	11	1.4	71	8.8	131	16.3
12	18 33.0	18 36.1	17 42.3	12	1.5	72	8.9	132	16.4
13	18 33.3	18 36.3	17 42.5	13	1.6	73	9.1	133	16.5
14	18 33.5	18 36.6	17 42.8	14	1.7	74	9.2	134	16.6
15	18 33.8	18 36.8	17 43.0	15	1.9	75	9.3	135	16.8
16	18 34.0	18 37.1	17 43.3	16	2.0	76	9.4	136	16.9
17	18 34.3	18 37.3	17 43.5	17	2.1	77	9.6	137	17.0
18	18 34.5	18 37.6	17 43.7	18	2.2	78	9.7	138	17.1
19	18 34.8	18 37.8	17 44.0	19	2.4	79	9.8	139	17.3
20	18 35.0	18 38.1	17 44.2	20	2.5	80	9.9	140	17.4
21	18 35.3	18 38.3	17 44.4	21	2.6	81	10.1	141	17.5
22	18 35.5	18 38.6	17 44.7	22	2.7	82	10.2	142	17.6
23	18 35.8	18 38.8	17 44.9	23	2.9	83	10.3	143	17.8
24	18 36.0	18 39.1	17 45.2	24	3.0	84	10.4	144	17.9
25	18 36.3	18 39.4	17 45.4	25	3.1	85	10.6	145	18.0
26	18 36.5	18 39.6	17 45.6	26	3.2	86	10.7	146	18.1
27	18 36.8	18 39.9	17 45.9	27	3.4	87	10.8	147	18.3
28	18 37.0	18 40.1	17 46.1	28	3.5	88	10.9	148	18.4
29	18 37.3	18 40.4	17 46.4	29	3.6	89	11.1	149	18.5
30	18 37.5	18 40.6	17 46.6	30	3.7	90	11.2	150	18.6
31	18 37.8	18 40.9	17 46.8	31	3.8	91	11.3	151	18.7
32	18 38.0	18 41.1	17 47.1	32	4.0	92	11.4	152	18.9
33	18 38.3	18 41.4	17 47.3	33	4.1	93	11.5	153	19.0
34	18 38.5	18 41.6	17 47.5	34	4.2	94	11.7	154	19.1
35	18 38.8	18 41.9	17 47.8	35	4.3	95	11.8	155	19.2
36	18 39.0	18 42.1	17 48.0	36	4.5	96	11.9	156	19.4
37	18 39.3	18 42.4	17 48.3	37	4.6	97	12.0	157	19.5
38	18 39.5	18 42.6	17 48.5	38	4.7	98	12.2	158	19.6
39	18 39.8	18 42.9	17 48.7	39	4.8	99	12.3	159	19.7
40	18 40.0	18 43.1	17 49.0	40	5.0	100	12.4	160	19.9
41	18 40.3	18 43.4	17 49.2	41	5.1	101	12.5	161	20.0
42	18 40.5	18 43.6	17 49.5	42	5.2	102	12.7	162	20.1
43	18 40.8	18 43.9	17 49.7	43	5.3	103	12.8	163	20.2
44	18 41.0	18 44.1	17 49.9	44	5.5	104	12.9	164	20.4
45	18 41.3	18 44.4	17 50.2	45	5.6	105	13.0	165	20.5
46	18 41.5	18 44.6	17 50.4	46	5.7	106	13.2	166	20.6
47	18 41.8	18 44.9	17 50.6	47	5.8	107	13.3	167	20.7
48	18 42.0	18 45.1	17 50.9	48	6.0	108	13.4	168	20.9
49	18 42.3	18 45.4	17 51.1	49	6.1	109	13.5	169	21.0
50	18 42.5	18 45.6	17 51.4	50	6.2	110	13.7	170	21.1
51	18 42.8	18 45.9	17 51.6	51	6.3	111	13.8	171	21.2
52	18 43.0	18 46.1	17 51.8	52	6.5	112	13.9	172	21.4
53	18 43.3	18 46.4	17 52.1	53	6.6	113	14.0	173	21.5
54	18 43.5	18 46.6	17 52.3	54	6.7	114	14.2	174	21.6
55	18 43.8	18 46.9	17 52.6	55	6.8	115	14.3	175	21.7
56	18 44.0	18 47.1	17 52.8	56	7.0	116	14.4	176	21.9
57	18 44.3	18 47.4	17 53.0	57	7.1	117	14.5	177	22.0
58	18 44.5	18 47.6	17 53.3	58	7.2	118	14.7	178	22.1
59	18 44.8	18 47.9	17 53.5	59	7.3	119	14.8	179	22.2
60	18 45.0	18 48.1	17 53.8	60	7.5	120	14.9	180	22.4

1 h 15 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	18 45.0	18 48.1	17 53.8	0	.0	60	7.6	120	15.1
1	18 45.3	18 48.4	17 54.0	1	.1	61	7.7	121	15.2
2	18 45.5	18 48.6	17 54.2	2	.3	62	7.8	122	15.4
3	18 45.8	18 48.9	17 54.5	3	.4	63	7.9	123	15.5
4	18 46.0	18 49.1	17 54.7	4	.5	64	8.1	124	15.6
5	18 46.3	18 49.4	17 54.9	5	.6	65	8.2	125	15.7
6	18 46.5	18 49.6	17 55.2	6	.8	66	8.3	126	15.9
7	18 46.8	18 49.9	17 55.4	7	.9	67	8.4	127	16.0
8	18 47.0	18 50.1	17 55.7	8	1.0	68	8.6	128	16.1
9	18 47.3	18 50.4	17 55.9	9	1.1	69	8.7	129	16.2
10	18 47.5	18 50.6	17 56.1	10	1.3	70	8.8	130	16.4
11	18 47.8	18 50.9	17 56.4	11	1.4	71	8.9	131	16.5
12	18 48.0	18 51.1	17 56.6	12	1.5	72	9.1	132	16.6
13	18 48.3	18 51.4	17 56.9	13	1.6	73	9.2	133	16.7
14	18 48.5	18 51.6	17 57.1	14	1.8	74	9.3	134	16.9
15	18 48.8	18 51.9	17 57.3	15	1.9	75	9.4	135	17.0
16	18 49.0	18 52.1	17 57.6	16	2.0	76	9.6	136	17.1
17	18 49.3	18 52.4	17 57.8	17	2.1	77	9.7	137	17.2
18	18 49.5	18 52.6	17 58.0	18	2.3	78	9.8	138	17.4
19	18 49.8	18 52.9	17 58.3	19	2.4	79	9.9	139	17.5
20	18 50.0	18 53.1	17 58.5	20	2.5	80	10.1	140	17.6
21	18 50.3	18 53.4	17 58.8	21	2.6	81	10.2	141	17.7
22	18 50.5	18 53.6	17 59.0	22	2.8	82	10.3	142	17.9
23	18 50.8	18 53.9	17 59.2	23	2.9	83	10.4	143	18.0
24	18 51.0	18 54.1	17 59.5	24	3.0	84	10.6	144	18.1
25	18 51.3	18 54.4	17 59.7	25	3.1	85	10.7	145	18.2
26	18 51.5	18 54.6	17 60.0	26	3.3	86	10.8	146	18.4
27	18 51.8	18 54.9	18 .2	27	3.4	87	10.9	147	18.5
28	18 52.0	18 55.1	18 .4	28	3.5	88	11.1	148	18.6
29	18 52.3	18 55.4	18 .7	29	3.6	89	11.2	149	18.7
30	18 52.5	18 55.6	18 .9	30	3.8	90	11.3	150	18.9
31	18 52.8	18 55.9	18 1.1	31	3.9	91	11.5	151	19.0
32	18 53.0	18 56.1	18 1.4	32	4.0	92	11.6	152	19.1
33	18 53.3	18 56.4	18 1.6	33	4.2	93	11.7	153	19.3
34	18 53.5	18 56.6	18 1.9	34	4.3	94	11.8	154	19.4
35	18 53.8	18 56.9	18 2.1	35	4.4	95	12.0	155	19.5
36	18 54.0	18 57.2	18 2.3	36	4.5	96	12.1	156	19.6
37	18 54.3	18 57.4	18 2.6	37	4.7	97	12.2	157	19.8
38	18 54.5	18 57.7	18 2.8	38	4.8	98	12.3	158	19.9
39	18 54.8	18 57.9	18 3.1	39	4.9	99	12.5	159	20.0
40	18 55.0	18 58.2	18 3.3	40	5.0	100	12.6	160	20.1
41	18 55.3	18 58.4	18 3.5	41	5.2	101	12.7	161	20.3
42	18 55.5	18 58.7	18 3.8	42	5.3	102	12.8	162	20.4
43	18 55.8	18 58.9	18 4.0	43	5.4	103	13.0	163	20.5
44	18 56.0	18 59.2	18 4.2	44	5.5	104	13.1	164	20.6
45	18 56.3	18 59.4	18 4.5	45	5.7	105	13.2	165	20.8
46	18 56.5	18 59.7	18 4.7	46	5.8	106	13.3	166	20.9
47	18 56.8	18 59.9	18 5.0	47	5.9	107	13.5	167	21.0
48	18 57.0	19 .2	18 5.2	48	6.0	108	13.6	168	21.1
49	18 57.3	19 .4	18 5.4	49	6.2	109	13.7	169	21.3
50	18 57.5	19 .7	18 5.7	50	6.3	110	13.8	170	21.4
51	18 57.8	19 .9	18 5.9	51	6.4	111	14.0	171	21.5
52	18 58.0	19 1.2	18 6.2	52	6.5	112	14.1	172	21.6
53	18 58.3	19 1.4	18 6.4	53	6.7	113	14.2	173	21.8
54	18 58.5	19 1.7	18 6.6	54	6.8	114	14.3	174	21.9
55	18 58.8	19 1.9	18 6.9	55	6.9	115	14.5	175	22.0
56	18 59.0	19 2.2	18 7.1	56	7.0	116	14.6	176	22.1
57	18 59.3	19 2.4	18 7.4	57	7.2	117	14.7	177	22.3
58	18 59.5	19 2.7	18 7.6	58	7.3	118	14.8	178	22.4
59	18 59.8	19 2.9	18 7.8	59	7.4	119	15.0	179	22.5
60	19 .0	19 3.2	18 8.1	60	7.6	120	15.1	180	22.7

1 h 16 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	19	.0	19	3.2	18	8.1	0	.0	60	7.7	120	15.3
1	19	.3	19	3.4	18	8.3	1	.1	61	7.8	121	15.4
2	19	.5	19	3.7	18	8.5	2	.3	62	7.9	122	15.6
3	19	.8	19	3.9	18	8.8	3	.4	63	8.0	123	15.7
4	19	1.0	19	4.2	18	9.0	4	.5	64	8.2	124	15.8
5	19	1.3	19	4.4	18	9.3	5	.6	65	8.3	125	15.9
6	19	1.5	19	4.7	18	9.5	6	.8	66	8.4	126	16.1
7	19	1.8	19	4.9	18	9.7	7	.9	67	8.5	127	16.2
8	19	2.0	19	5.2	18	10.0	8	1.0	68	8.7	128	16.3
9	19	2.3	19	5.4	18	10.2	9	1.1	69	8.8	129	16.4
10	19	2.5	19	5.7	18	10.5	10	1.3	70	8.9	130	16.6
11	19	2.8	19	5.9	18	10.7	11	1.4	71	9.1	131	16.7
12	19	3.0	19	6.2	18	10.9	12	1.5	72	9.2	132	16.8
13	19	3.3	19	6.4	18	11.2	13	1.7	73	9.3	133	17.0
14	19	3.5	19	6.7	18	11.4	14	1.8	74	9.4	134	17.1
15	19	3.8	19	6.9	18	11.6	15	1.9	75	9.6	135	17.2
16	19	4.0	19	7.2	18	11.9	16	2.0	76	9.7	136	17.3
17	19	4.3	19	7.4	18	12.1	17	2.2	77	9.8	137	17.5
18	19	4.5	19	7.7	18	12.4	18	2.3	78	9.9	138	17.6
19	19	4.8	19	7.9	18	12.6	19	2.4	79	10.1	139	17.7
20	19	5.0	19	8.2	18	12.8	20	2.6	80	10.2	140	17.9
21	19	5.3	19	8.4	18	13.1	21	2.7	81	10.3	141	18.0
22	19	5.5	19	8.7	18	13.3	22	2.8	82	10.5	142	18.1
23	19	5.8	19	8.9	18	13.6	23	2.9	83	10.6	143	18.2
24	19	6.0	19	9.2	18	13.8	24	3.1	84	10.7	144	18.4
25	19	6.3	19	9.4	18	14.0	25	3.2	85	10.8	145	18.5
26	19	6.5	19	9.7	18	14.3	26	3.3	86	11.0	146	18.6
27	19	6.8	19	9.9	18	14.5	27	3.4	87	11.1	147	18.7
28	19	7.0	19	10.2	18	14.7	28	3.6	88	11.2	148	18.9
29	19	7.3	19	10.4	18	15.0	29	3.7	89	11.3	149	19.0
30	19	7.5	19	10.7	18	15.2	30	3.8	90	11.5	150	19.1
31	19	7.8	19	10.9	18	15.5	31	4.0	91	11.6	151	19.3
32	19	8.0	19	11.2	18	15.7	32	4.1	92	11.7	152	19.4
33	19	8.3	19	11.4	18	15.9	33	4.2	93	11.9	153	19.5
34	19	8.5	19	11.7	18	16.2	34	4.3	94	12.0	154	19.6
35	19	8.8	19	11.9	18	16.4	35	4.5	95	12.1	155	19.8
36	19	9.0	19	12.2	18	16.7	36	4.6	96	12.2	156	19.9
37	19	9.3	19	12.4	18	16.9	37	4.7	97	12.4	157	20.0
38	19	9.5	19	12.7	18	17.1	38	4.8	98	12.5	158	20.1
39	19	9.8	19	12.9	18	17.4	39	5.0	99	12.6	159	20.3
40	19	10.0	19	13.2	18	17.6	40	5.1	100	12.8	160	20.4
41	19	10.3	19	13.4	18	17.8	41	5.2	101	12.9	161	20.5
42	19	10.5	19	13.7	18	18.1	42	5.4	102	13.0	162	20.7
43	19	10.8	19	13.9	18	18.3	43	5.5	103	13.1	163	20.8
44	19	11.0	19	14.2	18	18.6	44	5.6	104	13.3	164	20.9
45	19	11.3	19	14.4	18	18.8	45	5.7	105	13.4	165	21.0
46	19	11.5	19	14.7	18	19.0	46	5.9	106	13.5	166	21.2
47	19	11.8	19	14.9	18	19.3	47	6.0	107	13.6	167	21.3
48	19	12.0	19	15.2	18	19.5	48	6.1	108	13.8	168	21.4
49	19	12.3	19	15.5	18	19.8	49	6.2	109	13.9	169	21.5
50	19	12.5	19	15.7	18	20.0	50	6.4	110	14.0	170	21.7
51	19	12.8	19	16.0	18	20.2	51	6.5	111	14.2	171	21.8
52	19	13.0	19	16.2	18	20.5	52	6.6	112	14.3	172	21.9
53	19	13.3	19	16.5	18	20.7	53	6.8	113	14.4	173	22.1
54	19	13.5	19	16.7	18	21.0	54	6.9	114	14.5	174	22.2
55	19	13.8	19	17.0	18	21.2	55	7.0	115	14.7	175	22.3
56	19	14.0	19	17.2	18	21.4	56	7.1	116	14.8	176	22.4
57	19	14.3	19	17.5	18	21.7	57	7.3	117	14.9	177	22.6
58	19	14.5	19	17.7	18	21.9	58	7.4	118	15.0	178	22.7
59	19	14.8	19	18.0	18	22.1	59	7.5	119	15.2	179	22.8
60	19	15.0	19	18.2	18	22.4	60	7.7	120	15.3	180	23.0

1 h 17 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	19	15.0	19	18.2	18	22.4	0	.0	60	7.8	120	15.5
1	19	15.3	19	18.5	18	22.6	1	.1	61	7.9	121	15.6
2	19	15.5	19	18.7	18	22.9	2	.3	62	8.0	122	15.8
3	19	15.8	19	19.0	18	23.1	3	.4	63	8.1	123	15.9
4	19	16.0	19	19.2	18	23.3	4	.5	64	8.3	124	16.0
5	19	16.3	19	19.5	18	23.6	5	.6	65	8.4	125	16.1
6	19	16.5	19	19.7	18	23.8	6	.8	66	8.5	126	16.3
7	19	16.8	19	20.0	18	24.1	7	.9	67	8.7	127	16.4
8	19	17.0	19	20.2	18	24.3	8	1.0	68	8.8	128	16.5
9	19	17.3	19	20.5	18	24.5	9	1.2	69	8.9	129	16.7
10	19	17.5	19	20.7	18	24.8	10	1.3	70	9.0	130	16.8
11	19	17.8	19	21.0	18	25.0	11	1.4	71	9.2	131	16.9
12	19	18.0	19	21.2	18	25.2	12	1.6	72	9.3	132	17.1
13	19	18.3	19	21.5	18	25.5	13	1.7	73	9.4	133	17.2
14	19	18.5	19	21.7	18	25.7	14	1.8	74	9.6	134	17.3
15	19	18.8	19	22.0	18	26.0	15	1.9	75	9.7	135	17.4
16	19	19.0	19	22.2	18	26.2	16	2.1	76	9.8	136	17.6
17	19	19.3	19	22.5	18	26.4	17	2.2	77	9.9	137	17.7
18	19	19.5	19	22.7	18	26.7	18	2.3	78	10.1	138	17.8
19	19	19.8	19	23.0	18	26.9	19	2.5	79	10.2	139	18.0
20	19	20.0	19	23.2	18	27.2	20	2.6	80	10.3	140	18.1
21	19	20.3	19	23.5	18	27.4	21	2.7	81	10.5	141	18.2
22	19	20.5	19	23.7	18	27.6	22	2.8	82	10.6	142	18.3
23	19	20.8	19	24.0	18	27.9	23	3.0	83	10.7	143	18.5
24	19	21.0	19	24.2	18	28.1	24	3.1	84	10.9	144	18.6
25	19	21.3	19	24.5	18	28.3	25	3.2	85	11.0	145	18.7
26	19	21.5	19	24.7	18	28.6	26	3.4	86	11.1	146	18.9
27	19	21.8	19	25.0	18	28.8	27	3.5	87	11.2	147	19.0
28	19	22.0	19	25.2	18	29.1	28	3.6	88	11.4	148	19.1
29	19	22.3	19	25.5	18	29.3	29	3.7	89	11.5	149	19.2
30	19	22.5	19	25.7	18	29.5	30	3.9	90	11.6	150	19.4
31	19	22.8	19	26.0	18	29.8	31	4.0	91	11.8	151	19.5
32	19	23.0	19	26.2	18	30.0	32	4.1	92	11.9	152	19.6
33	19	23.3	19	26.5	18	30.3	33	4.3	93	12.0	153	19.8
34	19	23.5	19	26.7	18	30.5	34	4.4	94	12.1	154	19.9
35	19	23.8	19	27.0	18	30.7	35	4.5	95	12.3	155	20.0
36	19	24.0	19	27.2	18	31.0	36	4.7	96	12.4	156	20.2
37	19	24.3	19	27.5	18	31.2	37	4.8	97	12.5	157	20.3
38	19	24.5	19	27.7	18	31.5	38	4.9	98	12.7	158	20.4
39	19	24.8	19	28.0	18	31.7	39	5.0	99	12.8	159	20.5
40	19	25.0	19	28.2	18	31.9	40	5.2	100	12.9	160	20.7
41	19	25.3	19	28.5	18	32.2	41	5.3	101	13.0	161	20.8
42	19	25.5	19	28.7	18	32.4	42	5.4	102	13.2	162	20.9
43	19	25.8	19	29.0	18	32.6	43	5.6	103	13.3	163	21.1
44	19	26.0	19	29.2	18	32.9	44	5.7	104	13.4	164	21.2
45	19	26.3	19	29.5	18	33.1	45	5.8	105	13.6	165	21.3
46	19	26.5	19	29.7	18	33.4	46	5.9	106	13.7	166	21.4
47	19	26.8	19	30.0	18	33.6	47	6.1	107	13.8	167	21.6
48	19	27.0	19	30.2	18	33.8	48	6.2	108	14.0	168	21.7
49	19	27.3	19	30.5	18	34.1	49	6.3	109	14.1	169	21.8
50	19	27.5	19	30.7	18	34.3	50	6.5	110	14.2	170	22.0
51	19	27.8	19	31.0	18	34.6	51	6.6	111	14.3	171	22.1
52	19	28.0	19	31.2	18	34.8	52	6.7	112	14.5	172	22.2
53	19	28.3	19	31.5	18	35.0	53	6.8	113	14.6	173	22.3
54	19	28.5	19	31.7	18	35.3	54	7.0	114	14.7	174	22.5
55	19	28.8	19	32.0	18	35.5	55	7.1	115	14.9	175	22.6
56	19	29.0	19	32.2	18	35.7	56	7.2	116	15.0	176	22.7
57	19	29.3	19	32.5	18	36.0	57	7.4	117	15.1	177	22.9
58	19	29.5	19	32.7	18	36.2	58	7.5	118	15.2	178	23.0
59	19	29.8	19	33.0	18	36.5	59	7.6	119	15.4	179	23.1
60	19	30.0	19	33.3	18	36.7	60	7.8	120	15.5	180	23.3

1 h 18 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	19 30.0	19 33.3	18 36.7	0	.0	60	7.9	120	15.7
1	19 30.3	19 33.5	18 36.9	1	.1	61	8.0	121	15.8
2	19 30.5	19 33.8	18 37.2	2	.3	62	8.1	122	16.0
3	19 30.8	19 34.0	18 37.4	3	.4	63	8.2	123	16.1
4	19 31.0	19 34.3	18 37.7	4	.5	64	8.4	124	16.2
5	19 31.3	19 34.5	18 37.9	5	.7	65	8.5	125	16.4
6	19 31.5	19 34.8	18 38.1	6	.8	66	8.6	126	16.5
7	19 31.8	19 35.0	18 38.4	7	.9	67	8.8	127	16.6
8	19 32.0	19 35.3	18 38.6	8	1.0	68	8.9	128	16.7
9	19 32.3	19 35.5	18 38.8	9	1.2	69	9.0	129	16.9
10	19 32.5	19 35.8	18 39.1	10	1.3	70	9.2	130	17.0
11	19 32.8	19 36.0	18 39.3	11	1.4	71	9.3	131	17.1
12	19 33.0	19 36.3	18 39.6	12	1.6	72	9.4	132	17.3
13	19 33.3	19 36.5	18 39.8	13	1.7	73	9.6	133	17.4
14	19 33.5	19 36.8	18 40.0	14	1.8	74	9.7	134	17.5
15	19 33.8	19 37.0	18 40.3	15	2.0	75	9.8	135	17.7
16	19 34.0	19 37.3	18 40.5	16	2.1	76	9.9	136	17.8
17	19 34.3	19 37.5	18 40.8	17	2.2	77	10.1	137	17.9
18	19 34.5	19 37.8	18 41.0	18	2.4	78	10.2	138	18.1
19	19 34.8	19 38.0	18 41.2	19	2.5	79	10.3	139	18.2
20	19 35.0	19 38.3	18 41.5	20	2.6	80	10.5	140	18.3
21	19 35.3	19 38.5	18 41.7	21	2.7	81	10.6	141	18.4
22	19 35.5	19 38.8	18 41.9	22	2.9	82	10.7	142	18.6
23	19 35.8	19 39.0	18 42.2	23	3.0	83	10.9	143	18.7
24	19 36.0	19 39.3	18 42.4	24	3.1	84	11.0	144	18.8
25	19 36.3	19 39.5	18 42.7	25	3.3	85	11.1	145	19.0
26	19 36.5	19 39.8	18 42.9	26	3.4	86	11.3	146	19.1
27	19 36.8	19 40.0	18 43.1	27	3.5	87	11.4	147	19.2
28	19 37.0	19 40.3	18 43.4	28	3.7	88	11.5	148	19.4
29	19 37.3	19 40.5	18 43.6	29	3.8	89	11.6	149	19.5
30	19 37.5	19 40.8	18 43.9	30	3.9	90	11.8	150	19.6
31	19 37.8	19 41.0	18 44.1	31	4.1	91	11.9	151	19.8
32	19 38.0	19 41.3	18 44.3	32	4.2	92	12.0	152	19.9
33	19 38.3	19 41.5	18 44.6	33	4.3	93	12.2	153	20.0
34	19 38.5	19 41.8	18 44.8	34	4.4	94	12.3	154	20.1
35	19 38.8	19 42.0	18 45.1	35	4.6	95	12.4	155	20.3
36	19 39.0	19 42.3	18 45.3	36	4.7	96	12.6	156	20.4
37	19 39.3	19 42.5	18 45.5	37	4.8	97	12.7	157	20.5
38	19 39.5	19 42.8	18 45.8	38	5.0	98	12.8	158	20.7
39	19 39.8	19 43.0	18 46.0	39	5.1	99	13.0	159	20.8
40	19 40.0	19 43.3	18 46.2	40	5.2	100	13.1	160	20.9
41	19 40.3	19 43.5	18 46.5	41	5.4	101	13.2	161	21.1
42	19 40.5	19 43.8	18 46.7	42	5.5	102	13.3	162	21.2
43	19 40.8	19 44.0	18 47.0	43	5.6	103	13.5	163	21.3
44	19 41.0	19 44.3	18 47.2	44	5.8	104	13.6	164	21.5
45	19 41.3	19 44.5	18 47.4	45	5.9	105	13.7	165	21.6
46	19 41.5	19 44.8	18 47.7	46	6.0	106	13.9	166	21.7
47	19 41.8	19 45.0	18 47.9	47	6.1	107	14.0	167	21.8
48	19 42.0	19 45.3	18 48.2	48	6.3	108	14.1	168	22.0
49	19 42.3	19 45.5	18 48.4	49	6.4	109	14.3	169	22.1
50	19 42.5	19 45.8	18 48.6	50	6.5	110	14.4	170	22.2
51	19 42.8	19 46.0	18 48.9	51	6.7	111	14.5	171	22.4
52	19 43.0	19 46.3	18 49.1	52	6.8	112	14.7	172	22.5
53	19 43.3	19 46.5	18 49.3	53	6.9	113	14.8	173	22.6
54	19 43.5	19 46.8	18 49.6	54	7.1	114	14.9	174	22.8
55	19 43.8	19 47.0	18 49.8	55	7.2	115	15.0	175	22.9
56	19 44.0	19 47.3	18 50.1	56	7.3	116	15.2	176	23.0
57	19 44.3	19 47.5	18 50.3	57	7.5	117	15.3	177	23.2
58	19 44.5	19 47.8	18 50.5	58	7.6	118	15.4	178	23.3
59	19 44.8	19 48.0	18 50.8	59	7.7	119	15.6	179	23.4
60	19 45.0	19 48.3	18 51.0	60	7.9	120	15.7	180	23.6

1 h 19 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	19 45.0	19 48.3	18 51.0	0	.0	60	8.0	120	15.9
1	19 45.3	19 48.5	18 51.3	1	.1	61	8.1	121	16.0
2	19 45.5	19 48.8	18 51.5	2	.3	62	8.2	122	16.2
3	19 45.8	19 49.0	18 51.7	3	.4	63	8.3	123	16.3
4	19 46.0	19 49.3	18 52.0	4	.5	64	8.5	124	16.4
5	19 46.3	19 49.5	18 52.2	5	.7	65	8.6	125	16.6
6	19 46.5	19 49.8	18 52.4	6	.8	66	8.7	126	16.7
7	19 46.8	19 50.0	18 52.7	7	.9	67	8.9	127	16.8
8	19 47.0	19 50.3	18 52.9	8	1.1	68	9.0	128	17.0
9	19 47.3	19 50.5	18 53.2	9	1.2	69	9.1	129	17.1
10	19 47.5	19 50.8	18 53.4	10	1.3	70	9.3	130	17.2
11	19 47.8	19 51.0	18 53.6	11	1.5	71	9.4	131	17.4
12	19 48.0	19 51.3	18 53.9	12	1.6	72	9.5	132	17.5
13	19 48.3	19 51.6	18 54.1	13	1.7	73	9.7	133	17.6
14	19 48.5	19 51.8	18 54.4	14	1.9	74	9.8	134	17.8
15	19 48.8	19 52.1	18 54.6	15	2.0	75	9.9	135	17.9
16	19 49.0	19 52.3	18 54.8	16	2.1	76	10.1	136	18.0
17	19 49.3	19 52.6	18 55.1	17	2.3	77	10.2	137	18.2
18	19 49.5	19 52.8	18 55.3	18	2.4	78	10.3	138	18.3
19	19 49.8	19 53.1	18 55.6	19	2.5	79	10.5	139	18.4
20	19 50.0	19 53.3	18 55.8	20	2.7	80	10.6	140	18.6
21	19 50.3	19 53.6	18 56.0	21	2.8	81	10.7	141	18.7
22	19 50.5	19 53.8	18 56.3	22	2.9	82	10.9	142	18.8
23	19 50.8	19 54.1	18 56.5	23	3.0	83	11.0	143	18.9
24	19 51.0	19 54.3	18 56.7	24	3.2	84	11.1	144	19.1
25	19 51.3	19 54.6	18 57.0	25	3.3	85	11.3	145	19.2
26	19 51.5	19 54.8	18 57.2	26	3.4	86	11.4	146	19.3
27	19 51.8	19 55.1	18 57.5	27	3.6	87	11.5	147	19.5
28	19 52.0	19 55.3	18 57.7	28	3.7	88	11.7	148	19.6
29	19 52.3	19 55.6	18 57.9	29	3.8	89	11.8	149	19.7
30	19 52.5	19 55.8	18 58.2	30	4.0	90	11.9	150	19.9
31	19 52.8	19 56.1	18 58.4	31	4.1	91	12.1	151	20.0
32	19 53.0	19 56.3	18 58.7	32	4.2	92	12.2	152	20.1
33	19 53.3	19 56.6	18 58.9	33	4.4	93	12.3	153	20.3
34	19 53.5	19 56.8	18 59.1	34	4.5	94	12.5	154	20.4
35	19 53.8	19 57.1	18 59.4	35	4.6	95	12.6	155	20.5
36	19 54.0	19 57.3	18 59.6	36	4.8	96	12.7	156	20.7
37	19 54.3	19 57.6	18 59.8	37	4.9	97	12.9	157	20.8
38	19 54.5	19 57.8	19 .1	38	5.0	98	13.0	158	20.9
39	19 54.8	19 58.1	19 .3	39	5.2	99	13.1	159	21.1
40	19 55.0	19 58.3	19 .6	40	5.3	100	13.3	160	21.2
41	19 55.3	19 58.6	19 .8	41	5.4	101	13.4	161	21.3
42	19 55.5	19 58.8	19 1.0	42	5.6	102	13.5	162	21.5
43	19 55.8	19 59.1	19 1.3	43	5.7	103	13.6	163	21.6
44	19 56.0	19 59.3	19 1.5	44	5.8	104	13.8	164	21.7
45	19 56.3	19 59.6	19 1.8	45	6.0	105	13.9	165	21.9
46	19 56.5	19 59.8	19 2.0	46	6.1	106	14.0	166	22.0
47	19 56.8	20 .1	19 2.2	47	6.2	107	14.2	167	22.1
48	19 57.0	20 .3	19 2.5	48	6.4	108	14.3	168	22.3
49	19 57.3	20 .6	19 2.7	49	6.5	109	14.4	169	22.4
50	19 57.5	20 .8	19 2.9	50	6.6	110	14.6	170	22.5
51	19 57.8	20 1.1	19 3.2	51	6.8	111	14.7	171	22.7
52	19 58.0	20 1.3	19 3.4	52	6.9	112	14.8	172	22.8
53	19 58.3	20 1.6	19 3.7	53	7.0	113	15.0	173	22.9
54	19 58.5	20 1.8	19 3.9	54	7.2	114	15.1	174	23.1
55	19 58.8	20 2.1	19 4.1	55	7.3	115	15.2	175	23.2
56	19 59.0	20 2.3	19 4.4	56	7.4	116	15.4	176	23.3
57	19 59.3	20 2.6	19 4.6	57	7.6	117	15.5	177	23.5
58	19 59.5	20 2.8	19 4.9	58	7.7	118	15.6	178	23.6
59	19 59.8	20 3.1	19 5.1	59	7.8	119	15.8	179	23.7
60	20 .0	20 3.3	19 5.3	60	8.0	120	15.9	180	23.9

1 h 20 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	20	.0	20	3.3	19	5.3	0	.0	60	8.1	120	16.1
1	20	.3	20	3.6	19	5.6	1	.1	61	8.2	121	16.2
2	20	.5	20	3.8	19	5.8	2	.3	62	8.3	122	16.4
3	20	.8	20	4.1	19	6.0	3	.4	63	8.5	123	16.5
4	20	1.0	20	4.3	19	6.3	4	.5	64	8.6	124	16.6
5	20	1.3	20	4.6	19	6.5	5	.7	65	8.7	125	16.8
6	20	1.5	20	4.8	19	6.8	6	.8	66	8.9	126	16.9
7	20	1.8	20	5.1	19	7.0	7	.9	67	9.0	127	17.0
8	20	2.0	20	5.3	19	7.2	8	1.1	68	9.1	128	17.2
9	20	2.3	20	5.6	19	7.5	9	1.2	69	9.3	129	17.3
10	20	2.5	20	5.8	19	7.7	10	1.3	70	9.4	130	17.4
11	20	2.8	20	6.1	19	8.0	11	1.5	71	9.5	131	17.6
12	20	3.0	20	6.3	19	8.2	12	1.6	72	9.7	132	17.7
13	20	3.3	20	6.6	19	8.4	13	1.7	73	9.8	133	17.8
14	20	3.5	20	6.8	19	8.7	14	1.9	74	9.9	134	18.0
15	20	3.8	20	7.1	19	8.9	15	2.0	75	10.1	135	18.1
16	20	4.0	20	7.3	19	9.2	16	2.1	76	10.2	136	18.2
17	20	4.3	20	7.6	19	9.4	17	2.3	77	10.3	137	18.4
18	20	4.5	20	7.8	19	9.6	18	2.4	78	10.5	138	18.5
19	20	4.8	20	8.1	19	9.9	19	2.5	79	10.6	139	18.6
20	20	5.0	20	8.3	19	10.1	20	2.7	80	10.7	140	18.8
21	20	5.3	20	8.6	19	10.3	21	2.8	81	10.9	141	18.9
22	20	5.5	20	8.8	19	10.6	22	3.0	82	11.0	142	19.1
23	20	5.8	20	9.1	19	10.8	23	3.1	83	11.1	143	19.2
24	20	6.0	20	9.4	19	11.1	24	3.2	84	11.3	144	19.3
25	20	6.3	20	9.6	19	11.3	25	3.4	85	11.4	145	19.5
26	20	6.5	20	9.9	19	11.5	26	3.5	86	11.5	146	19.6
27	20	6.8	20	10.1	19	11.8	27	3.6	87	11.7	147	19.7
28	20	7.0	20	10.4	19	12.0	28	3.8	88	11.8	148	19.9
29	20	7.3	20	10.6	19	12.3	29	3.9	89	11.9	149	20.0
30	20	7.5	20	10.9	19	12.5	30	4.0	90	12.1	150	20.1
31	20	7.8	20	11.1	19	12.7	31	4.2	91	12.2	151	20.3
32	20	8.0	20	11.4	19	13.0	32	4.3	92	12.3	152	20.4
33	20	8.3	20	11.6	19	13.2	33	4.4	93	12.5	153	20.5
34	20	8.5	20	11.9	19	13.4	34	4.6	94	12.6	154	20.7
35	20	8.8	20	12.1	19	13.7	35	4.7	95	12.7	155	20.8
36	20	9.0	20	12.4	19	13.9	36	4.8	96	12.9	156	20.9
37	20	9.3	20	12.6	19	14.2	37	5.0	97	13.0	157	21.1
38	20	9.5	20	12.9	19	14.4	38	5.1	98	13.1	158	21.2
39	20	9.8	20	13.1	19	14.6	39	5.2	99	13.3	159	21.3
40	20	10.0	20	13.4	19	14.9	40	5.4	100	13.4	160	21.5
41	20	10.3	20	13.6	19	15.1	41	5.5	101	13.6	161	21.6
42	20	10.5	20	13.9	19	15.4	42	5.6	102	13.7	162	21.7
43	20	10.8	20	14.1	19	15.6	43	5.8	103	13.8	163	21.9
44	20	11.0	20	14.4	19	15.8	44	5.9	104	14.0	164	22.0
45	20	11.3	20	14.6	19	16.1	45	6.0	105	14.1	165	22.1
46	20	11.5	20	14.9	19	16.3	46	6.2	106	14.2	166	22.3
47	20	11.8	20	15.1	19	16.5	47	6.3	107	14.4	167	22.4
48	20	12.0	20	15.4	19	16.8	48	6.4	108	14.5	168	22.5
49	20	12.3	20	15.6	19	17.0	49	6.6	109	14.6	169	22.7
50	20	12.5	20	15.9	19	17.3	50	6.7	110	14.8	170	22.8
51	20	12.8	20	16.1	19	17.5	51	6.8	111	14.9	171	22.9
52	20	13.0	20	16.4	19	17.7	52	7.0	112	15.0	172	23.1
53	20	13.3	20	16.6	19	18.0	53	7.1	113	15.2	173	23.2
54	20	13.5	20	16.9	19	18.2	54	7.2	114	15.3	174	23.3
55	20	13.8	20	17.1	19	18.5	55	7.4	115	15.4	175	23.5
56	20	14.0	20	17.4	19	18.7	56	7.5	116	15.6	176	23.6
57	20	14.3	20	17.6	19	18.9	57	7.6	117	15.7	177	23.7
58	20	14.5	20	17.9	19	19.2	58	7.8	118	15.8	178	23.9
59	20	14.8	20	18.1	19	19.4	59	7.9	119	16.0	179	24.0
60	20	15.0	20	18.4	19	19.7	60	8.1	120	16.1	180	24.2

1 h 21 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	20	15.0	20	18.4	19	19.7	0	.0	60	8.2	120	16.3
1	20	15.3	20	18.6	19	19.9	1	.1	61	8.3	121	16.4
2	20	15.5	20	18.9	19	20.1	2	.3	62	8.4	122	16.6
3	20	15.8	20	19.1	19	20.4	3	.4	63	8.6	123	16.7
4	20	16.0	20	19.4	19	20.6	4	.5	64	8.7	124	16.8
5	20	16.3	20	19.6	19	20.8	5	.7	65	8.8	125	17.0
6	20	16.5	20	19.9	19	21.1	6	.8	66	9.0	126	17.1
7	20	16.8	20	20.1	19	21.3	7	1.0	67	9.1	127	17.3
8	20	17.0	20	20.4	19	21.6	8	1.1	68	9.2	128	17.4
9	20	17.3	20	20.6	19	21.8	9	1.2	69	9.4	129	17.5
10	20	17.5	20	20.9	19	22.0	10	1.4	70	9.5	130	17.7
11	20	17.8	20	21.1	19	22.3	11	1.5	71	9.6	131	17.8
12	20	18.0	20	21.4	19	22.5	12	1.6	72	9.8	132	17.9
13	20	18.3	20	21.6	19	22.8	13	1.8	73	9.9	133	18.1
14	20	18.5	20	21.9	19	23.0	14	1.9	74	10.1	134	18.2
15	20	18.8	20	22.1	19	23.2	15	2.0	75	10.2	135	18.3
16	20	19.0	20	22.4	19	23.5	16	2.2	76	10.3	136	18.5
17	20	19.3	20	22.6	19	23.7	17	2.3	77	10.5	137	18.6
18	20	19.5	20	22.9	19	23.9	18	2.4	78	10.6	138	18.7
19	20	19.8	20	23.1	19	24.2	19	2.6	79	10.7	139	18.9
20	20	20.0	20	23.4	19	24.4	20	2.7	80	10.9	140	19.0
21	20	20.3	20	23.6	19	24.7	21	2.9	81	11.0	141	19.2
22	20	20.5	20	23.9	19	24.9	22	3.0	82	11.1	142	19.3
23	20	20.8	20	24.1	19	25.1	23	3.1	83	11.3	143	19.4
24	20	21.0	20	24.4	19	25.4	24	3.3	84	11.4	144	19.6
25	20	21.3	20	24.6	19	25.6	25	3.4	85	11.5	145	19.7
26	20	21.5	20	24.9	19	25.9	26	3.5	86	11.7	146	19.8
27	20	21.8	20	25.1	19	26.1	27	3.7	87	11.8	147	20.0
28	20	22.0	20	25.4	19	26.3	28	3.8	88	12.0	148	20.1
29	20	22.3	20	25.6	19	26.6	29	3.9	89	12.1	149	20.2
30	20	22.5	20	25.9	19	26.8	30	4.1	90	12.2	150	20.4
31	20	22.8	20	26.1	19	27.0	31	4.2	91	12.4	151	20.5
32	20	23.0	20	26.4	19	27.3	32	4.3	92	12.5	152	20.6
33	20	23.3	20	26.6	19	27.5	33	4.5	93	12.6	153	20.8
34	20	23.5	20	26.9	19	27.8	34	4.6	94	12.8	154	20.9
35	20	23.8	20	27.1	19	28.0	35	4.8	95	12.9	155	21.1
36	20	24.0	20	27.4	19	28.2	36	4.9	96	13.0	156	21.2
37	20	24.3	20	27.7	19	28.5	37	5.0	97	13.2	157	21.3
38	20	24.5	20	27.9	19	28.7	38	5.2	98	13.3	158	21.5
39	20	24.8	20	28.2	19	29.0	39	5.3	99	13.4	159	21.6
40	20	25.0	20	28.4	19	29.2	40	5.4	100	13.6	160	21.7
41	20	25.3	20	28.7	19	29.4	41	5.6	101	13.7	161	21.9
42	20	25.5	20	28.9	19	29.7	42	5.7	102	13.9	162	22.0
43	20	25.8	20	29.2	19	29.9	43	5.8	103	14.0	163	22.1
44	20	26.0	20	29.4	19	30.1	44	6.0	104	14.1	164	22.3
45	20	26.3	20	29.7	19	30.4	45	6.1	105	14.3	165	22.4
46	20	26.5	20	29.9	19	30.6	46	6.2	106	14.4	166	22.5
47	20	26.8	20	30.2	19	30.9	47	6.4	107	14.5	167	22.7
48	20	27.0	20	30.4	19	31.1	48	6.5	108	14.7	168	22.8
49	20	27.3	20	30.7	19	31.3	49	6.7	109	14.8	169	23.0
50	20	27.5	20	30.9	19	31.6	50	6.8	110	14.9	170	23.1
51	20	27.8	20	31.2	19	31.8	51	6.9	111	15.1	171	23.2
52	20	28.0	20	31.4	19	32.1	52	7.1	112	15.2	172	23.4
53	20	28.3	20	31.7	19	32.3	53	7.2	113	15.3	173	23.5
54	20	28.5	20	31.9	19	32.5	54	7.3	114	15.5	174	23.6
55	20	28.8	20	32.2	19	32.8	55	7.5	115	15.6	175	23.8
56	20	29.0	20	32.4	19	33.0	56	7.6	116	15.8	176	23.9
57	20	29.3	20	32.7	19	33.3	57	7.7	117	15.9	177	24.0
58	20	29.5	20	32.9	19	33.5	58	7.9	118	16.0	178	24.2
59	20	29.8	20	33.2	19	33.7	59	8.0	119	16.2	179	24.3
60	20	30.0	20	33.4	19	34.0	60	8.2	120	16.3	180	24.5

1 h 22 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	20 30.0	20 33.4	19 34.0	0 .0	60 8.3	120 16.5
1	20 30.3	20 33.7	19 34.2	1 .1	61 8.4	121 16.6
2	20 30.5	20 33.9	19 34.4	2 .3	62 8.5	122 16.8
3	20 30.8	20 34.2	19 34.7	3 .4	63 8.7	123 16.9
4	20 31.0	20 34.4	19 34.9	4 .6	64 8.8	124 17.1
5	20 31.3	20 34.7	19 35.2	5 .7	65 8.9	125 17.2
6	20 31.5	20 34.9	19 35.4	6 .8	66 9.1	126 17.3
7	20 31.8	20 35.2	19 35.6	7 1.0	67 9.2	127 17.5
8	20 32.0	20 35.4	19 35.9	8 1.1	68 9.4	128 17.6
9	20 32.3	20 35.7	19 36.1	9 1.2	69 9.5	129 17.7
10	20 32.5	20 35.9	19 36.4	10 1.4	70 9.6	130 17.9
11	20 32.8	20 36.2	19 36.6	11 1.5	71 9.8	131 18.0
12	20 33.0	20 36.4	19 36.8	12 1.7	72 9.9	132 18.2
13	20 33.3	20 36.7	19 37.1	13 1.8	73 10.0	133 18.3
14	20 33.5	20 36.9	19 37.3	14 1.9	74 10.2	134 18.4
15	20 33.8	20 37.2	19 37.5	15 2.1	75 10.3	135 18.6
16	20 34.0	20 37.4	19 37.8	16 2.2	76 10.5	136 18.7
17	20 34.3	20 37.7	19 38.0	17 2.3	77 10.6	137 18.8
18	20 34.5	20 37.9	19 38.3	18 2.5	78 10.7	138 19.0
19	20 34.8	20 38.2	19 38.5	19 2.6	79 10.9	139 19.1
20	20 35.0	20 38.4	19 38.7	20 2.8	80 11.0	140 19.3
21	20 35.3	20 38.7	19 39.0	21 2.9	81 11.1	141 19.4
22	20 35.5	20 38.9	19 39.2	22 3.0	82 11.3	142 19.5
23	20 35.8	20 39.2	19 39.5	23 3.2	83 11.4	143 19.7
24	20 36.0	20 39.4	19 39.7	24 3.3	84 11.6	144 19.8
25	20 36.3	20 39.7	19 39.9	25 3.4	85 11.7	145 19.9
26	20 36.5	20 39.9	19 40.2	26 3.6	86 11.8	146 20.1
27	20 36.8	20 40.2	19 40.4	27 3.7	87 12.0	147 20.2
28	20 37.0	20 40.4	19 40.6	28 3.9	88 12.1	148 20.4
29	20 37.3	20 40.7	19 40.9	29 4.0	89 12.2	149 20.5
30	20 37.5	20 40.9	19 41.1	30 4.1	90 12.4	150 20.6
31	20 37.8	20 41.2	19 41.4	31 4.3	91 12.5	151 20.8
32	20 38.0	20 41.4	19 41.6	32 4.4	92 12.7	152 20.9
33	20 38.3	20 41.7	19 41.8	33 4.5	93 12.8	153 21.0
34	20 38.5	20 41.9	19 42.1	34 4.7	94 12.9	154 21.2
35	20 38.8	20 42.2	19 42.3	35 4.8	95 13.1	155 21.3
36	20 39.0	20 42.4	19 42.6	36 5.0	96 13.2	156 21.5
37	20 39.3	20 42.7	19 42.8	37 5.1	97 13.3	157 21.6
38	20 39.5	20 42.9	19 43.0	38 5.2	98 13.5	158 21.7
39	20 39.8	20 43.2	19 43.3	39 5.4	99 13.6	159 21.9
40	20 40.0	20 43.4	19 43.5	40 5.5	100 13.8	160 22.0
41	20 40.3	20 43.7	19 43.7	41 5.6	101 13.9	161 22.1
42	20 40.5	20 43.9	19 44.0	42 5.8	102 14.0	162 22.3
43	20 40.8	20 44.2	19 44.2	43 5.9	103 14.2	163 22.4
44	20 41.0	20 44.4	19 44.5	44 6.1	104 14.3	164 22.6
45	20 41.3	20 44.7	19 44.7	45 6.2	105 14.4	165 22.7
46	20 41.5	20 44.9	19 44.9	46 6.3	106 14.6	166 22.8
47	20 41.8	20 45.2	19 45.2	47 6.5	107 14.7	167 23.0
48	20 42.0	20 45.5	19 45.4	48 6.6	108 14.9	168 23.1
49	20 42.3	20 45.7	19 45.7	49 6.7	109 15.0	169 23.2
50	20 42.5	20 46.0	19 45.9	50 6.9	110 15.1	170 23.4
51	20 42.8	20 46.2	19 46.1	51 7.0	111 15.3	171 23.5
52	20 43.0	20 46.5	19 46.4	52 7.2	112 15.4	172 23.7
53	20 43.3	20 46.7	19 46.6	53 7.3	113 15.5	173 23.8
54	20 43.5	20 47.0	19 46.9	54 7.4	114 15.7	174 23.9
55	20 43.8	20 47.2	19 47.1	55 7.6	115 15.8	175 24.1
56	20 44.0	20 47.5	19 47.3	56 7.7	116 16.0	176 24.2
57	20 44.3	20 47.7	19 47.6	57 7.8	117 16.1	177 24.3
58	20 44.5	20 48.0	19 47.8	58 8.0	118 16.2	178 24.5
59	20 44.8	20 48.2	19 48.0	59 8.1	119 16.4	179 24.6
60	20 45.0	20 48.5	19 48.3	60 8.3	120 16.5	180 24.8

1 h 23 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	20 45.0	20 48.5	19 48.3	0 .0	60 8.4	120 16.7
1	20 45.3	20 48.7	19 48.5	1 .1	61 8.5	121 16.8
2	20 45.5	20 49.0	19 48.8	2 .3	62 8.6	122 17.0
3	20 45.8	20 49.2	19 49.0	3 .4	63 8.8	123 17.1
4	20 46.0	20 49.5	19 49.2	4 .6	64 8.9	124 17.3
5	20 46.3	20 49.7	19 49.5	5 .7	65 9.0	125 17.4
6	20 46.5	20 50.0	19 49.7	6 .8	66 9.2	126 17.5
7	20 46.8	20 50.2	19 50.0	7 1.0	67 9.3	127 17.7
8	20 47.0	20 50.5	19 50.2	8 1.1	68 9.5	128 17.8
9	20 47.3	20 50.7	19 50.4	9 1.3	69 9.6	129 18.0
10	20 47.5	20 51.0	19 50.7	10 1.4	70 9.7	130 18.1
11	20 47.8	20 51.2	19 50.9	11 1.5	71 9.9	131 18.2
12	20 48.0	20 51.5	19 51.1	12 1.7	72 10.0	132 18.4
13	20 48.3	20 51.7	19 51.4	13 1.8	73 10.2	133 18.5
14	20 48.5	20 52.0	19 51.6	14 1.9	74 10.3	134 18.6
15	20 48.8	20 52.2	19 51.9	15 2.1	75 10.4	135 18.8
16	20 49.0	20 52.5	19 52.1	16 2.2	76 10.6	136 18.9
17	20 49.3	20 52.7	19 52.3	17 2.4	77 10.7	137 19.1
18	20 49.5	20 53.0	19 52.6	18 2.5	78 10.9	138 19.2
19	20 49.8	20 53.2	19 52.8	19 2.6	79 11.0	139 19.3
20	20 50.0	20 53.5	19 53.1	20 2.8	80 11.1	140 19.5
21	20 50.3	20 53.7	19 53.3	21 2.9	81 11.3	141 19.6
22	20 50.5	20 54.0	19 53.5	22 3.1	82 11.4	142 19.8
23	20 50.8	20 54.2	19 53.8	23 3.2	83 11.6	143 19.9
24	20 51.0	20 54.5	19 54.0	24 3.3	84 11.7	144 20.0
25	20 51.3	20 54.7	19 54.2	25 3.5	85 11.8	145 20.2
26	20 51.5	20 55.0	19 54.5	26 3.6	86 12.0	146 20.3
27	20 51.8	20 55.2	19 54.7	27 3.8	87 12.1	147 20.5
28	20 52.0	20 55.5	19 55.0	28 3.9	88 12.2	148 20.6
29	20 52.3	20 55.7	19 55.2	29 4.0	89 12.4	149 20.7
30	20 52.5	20 56.0	19 55.4	30 4.2	90 12.5	150 20.9
31	20 52.8	20 56.2	19 55.7	31 4.3	91 12.7	151 21.0
32	20 53.0	20 56.5	19 55.9	32 4.5	92 12.8	152 21.2
33	20 53.3	20 56.7	19 56.2	33 4.6	93 12.9	153 21.3
34	20 53.5	20 57.0	19 56.4	34 4.7	94 13.1	154 21.4
35	20 53.8	20 57.2	19 56.6	35 4.9	95 13.2	155 21.6
36	20 54.0	20 57.5	19 56.9	36 5.0	96 13.4	156 21.7
37	20 54.3	20 57.7	19 57.1	37 5.1	97 13.5	157 21.8
38	20 54.5	20 58.0	19 57.4	38 5.3	98 13.6	158 22.0
39	20 54.8	20 58.2	19 57.6	39 5.4	99 13.8	159 22.1
40	20 55.0	20 58.5	19 57.8	40 5.6	100 13.9	160 22.3
41	20 55.3	20 58.7	19 58.1	41 5.7	101 14.1	161 22.4
42	20 55.5	20 59.0	19 58.3	42 5.8	102 14.2	162 22.5
43	20 55.8	20 59.2	19 58.5	43 6.0	103 14.3	163 22.7
44	20 56.0	20 59.5	19 58.8	44 6.1	104 14.5	164 22.8
45	20 56.3	20 59.7	19 59.0	45 6.3	105 14.6	165 23.0
46	20 56.5	20 60.0	19 59.3	46 6.4	106 14.8	166 23.1
47	20 56.8	21 .2	19 59.5	47 6.5	107 14.9	167 23.2
48	20 57.0	21 .5	19 59.7	48 6.7	108 15.0	168 23.4
49	20 57.3	21 .7	19 60.0	49 6.8	109 15.2	169 23.5
50	20 57.5	21 1.0	20 .2	50 7.0	110 15.3	170 23.7
51	20 57.8	21 1.2	20 .5	51 7.1	111 15.4	171 23.8
52	20 58.0	21 1.5	20 .7	52 7.2	112 15.6	172 23.9
53	20 58.3	21 1.7	20 .9	53 7.4	113 15.7	173 24.1
54	20 58.5	21 2.0	20 1.2	54 7.5	114 15.9	174 24.2
55	20 58.8	21 2.2	20 1.4	55 7.7	115 16.0	175 24.4
56	20 59.0	21 2.5	20 1.6	56 7.8	116 16.1	176 24.5
57	20 59.3	21 2.7	20 1.9	57 7.9	117 16.3	177 24.6
58	20 59.5	21 3.0	20 2.1	58 8.1	118 16.4	178 24.8
59	20 59.8	21 3.2	20 2.4	59 8.2	119 16.6	179 24.9
60	21 .0	21 3.5	20 2.6	60 8.4	120 16.7	180 25.1

1 h 24 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	21	.0	21	3.5	20	2.6	0	.0	60	8.5	120	16.9
1	21	.3	21	3.8	20	2.8	1	.1	61	8.6	121	17.0
2	21	.5	21	4.0	20	3.1	2	.3	62	8.7	122	17.2
3	21	.8	21	4.3	20	3.3	3	.4	63	8.9	123	17.3
4	21	1.0	21	4.5	20	3.6	4	.6	64	9.0	124	17.5
5	21	1.3	21	4.8	20	3.8	5	.7	65	9.2	125	17.6
6	21	1.5	21	5.0	20	4.0	6	.8	66	9.3	126	17.7
7	21	1.8	21	5.3	20	4.3	7	1.0	67	9.4	127	17.9
8	21	2.0	21	5.5	20	4.5	8	1.1	68	9.6	128	18.0
9	21	2.3	21	5.8	20	4.7	9	1.3	69	9.7	129	18.2
10	21	2.5	21	6.0	20	5.0	10	1.4	70	9.9	130	18.3
11	21	2.8	21	6.3	20	5.2	11	1.5	71	10.0	131	18.4
12	21	3.0	21	6.5	20	5.5	12	1.7	72	10.1	132	18.6
13	21	3.3	21	6.8	20	5.7	13	1.8	73	10.3	133	18.7
14	21	3.5	21	7.0	20	5.9	14	2.0	74	10.4	134	18.9
15	21	3.8	21	7.3	20	6.2	15	2.1	75	10.6	135	19.0
16	21	4.0	21	7.5	20	6.4	16	2.3	76	10.7	136	19.2
17	21	4.3	21	7.8	20	6.7	17	2.4	77	10.8	137	19.3
18	21	4.5	21	8.0	20	6.9	18	2.5	78	11.0	138	19.4
19	21	4.8	21	8.3	20	7.1	19	2.7	79	11.1	139	19.6
20	21	5.0	21	8.5	20	7.4	20	2.8	80	11.3	140	19.7
21	21	5.3	21	8.8	20	7.6	21	3.0	81	11.4	141	19.9
22	21	5.5	21	9.0	20	7.8	22	3.1	82	11.5	142	20.0
23	21	5.8	21	9.3	20	8.1	23	3.2	83	11.7	143	20.1
24	21	6.0	21	9.5	20	8.3	24	3.4	84	11.8	144	20.3
25	21	6.3	21	9.8	20	8.6	25	3.5	85	12.0	145	20.4
26	21	6.5	21	10.0	20	8.8	26	3.7	86	12.1	146	20.6
27	21	6.8	21	10.3	20	9.0	27	3.8	87	12.3	147	20.7
28	21	7.0	21	10.5	20	9.3	28	3.9	88	12.4	148	20.8
29	21	7.3	21	10.8	20	9.5	29	4.1	89	12.5	149	21.0
30	21	7.5	21	11.0	20	9.8	30	4.2	90	12.7	150	21.1
31	21	7.8	21	11.3	20	10.0	31	4.4	91	12.8	151	21.3
32	21	8.0	21	11.5	20	10.2	32	4.5	92	13.0	152	21.4
33	21	8.3	21	11.8	20	10.5	33	4.6	93	13.1	153	21.5
34	21	8.5	21	12.0	20	10.7	34	4.8	94	13.2	154	21.7
35	21	8.8	21	12.3	20	11.0	35	4.9	95	13.4	155	21.8
36	21	9.0	21	12.5	20	11.2	36	5.1	96	13.5	156	22.0
37	21	9.3	21	12.8	20	11.4	37	5.2	97	13.7	157	22.1
38	21	9.5	21	13.0	20	11.7	38	5.4	98	13.8	158	22.3
39	21	9.8	21	13.3	20	11.9	39	5.5	99	13.9	159	22.4
40	21	10.0	21	13.5	20	12.1	40	5.6	100	14.1	160	22.5
41	21	10.3	21	13.8	20	12.4	41	5.8	101	14.2	161	22.7
42	21	10.5	21	14.0	20	12.6	42	5.9	102	14.4	162	22.8
43	21	10.8	21	14.3	20	12.9	43	6.1	103	14.5	163	23.0
44	21	11.0	21	14.5	20	13.1	44	6.2	104	14.6	164	23.1
45	21	11.3	21	14.8	20	13.3	45	6.3	105	14.8	165	23.2
46	21	11.5	21	15.0	20	13.6	46	6.5	106	14.9	166	23.4
47	21	11.8	21	15.3	20	13.8	47	6.6	107	15.1	167	23.5
48	21	12.0	21	15.5	20	14.1	48	6.8	108	15.2	168	23.7
49	21	12.3	21	15.8	20	14.3	49	6.9	109	15.4	169	23.8
50	21	12.5	21	16.0	20	14.5	50	7.0	110	15.5	170	23.9
51	21	12.8	21	16.3	20	14.8	51	7.2	111	15.6	171	24.1
52	21	13.0	21	16.5	20	15.0	52	7.3	112	15.8	172	24.2
53	21	13.3	21	16.8	20	15.2	53	7.5	113	15.9	173	24.4
54	21	13.5	21	17.0	20	15.5	54	7.6	114	16.1	174	24.5
55	21	13.8	21	17.3	20	15.7	55	7.7	115	16.2	175	24.6
56	21	14.0	21	17.5	20	16.0	56	7.9	116	16.3	176	24.8
57	21	14.3	21	17.8	20	16.2	57	8.0	117	16.5	177	24.9
58	21	14.5	21	18.0	20	16.4	58	8.2	118	16.6	178	25.1
59	21	14.8	21	18.3	20	16.7	59	8.3	119	16.8	179	25.2
60	21	15.0	21	18.5	20	16.9	60	8.5	120	16.9	180	25.4

1 h 25 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	21	15.0	21	18.5	20	16.9	0	.0	60	8.6	120	17.1
1	21	15.3	21	18.8	20	17.2	1	.1	61	8.7	121	17.2
2	21	15.5	21	19.0	20	17.4	2	.3	62	8.8	122	17.4
3	21	15.8	21	19.3	20	17.6	3	.4	63	9.0	123	17.5
4	21	16.0	21	19.5	20	17.9	4	.6	64	9.1	124	17.7
5	21	16.3	21	19.8	20	18.1	5	.7	65	9.3	125	17.8
6	21	16.5	21	20.0	20	18.3	6	.9	66	9.4	126	18.0
7	21	16.8	21	20.3	20	18.6	7	1.0	67	9.5	127	18.1
8	21	17.0	21	20.5	20	18.8	8	1.1	68	9.7	128	18.2
9	21	17.3	21	20.8	20	19.1	9	1.3	69	9.8	129	18.4
10	21	17.5	21	21.0	20	19.3	10	1.4	70	10.0	130	18.5
11	21	17.8	21	21.3	20	19.5	11	1.6	71	10.1	131	18.7
12	21	18.0	21	21.6	20	19.8	12	1.7	72	10.3	132	18.8
13	21	18.3	21	21.8	20	20.0	13	1.9	73	10.4	133	19.0
14	21	18.5	21	22.1	20	20.3	14	2.0	74	10.5	134	19.1
15	21	18.8	21	22.3	20	20.5	15	2.1	75	10.7	135	19.2
16	21	19.0	21	22.6	20	20.7	16	2.3	76	10.8	136	19.4
17	21	19.3	21	22.8	20	21.0	17	2.4	77	11.0	137	19.5
18	21	19.5	21	23.1	20	21.2	18	2.6	78	11.1	138	19.7
19	21	19.8	21	23.3	20	21.5	19	2.7	79	11.3	139	19.8
20	21	20.0	21	23.6	20	21.7	20	2.9	80	11.4	140	20.0
21	21	20.3	21	23.8	20	21.9	21	3.0	81	11.5	141	20.1
22	21	20.5	21	24.1	20	22.2	22	3.1	82	11.7	142	20.2
23	21	20.8	21	24.3	20	22.4	23	3.3	83	11.8	143	20.4
24	21	21.0	21	24.6	20	22.6	24	3.4	84	12.0	144	20.5
25	21	21.3	21	24.8	20	22.9	25	3.6	85	12.1	145	20.7
26	21	21.5	21	25.1	20	23.1	26	3.7	86	12.3	146	20.8
27	21	21.8	21	25.3	20	23.4	27	3.8	87	12.4	147	20.9
28	21	22.0	21	25.6	20	23.6	28	4.0	88	12.5	148	21.1
29	21	22.3	21	25.8	20	23.8	29	4.1	89	12.7	149	21.2
30	21	22.5	21	26.1	20	24.1	30	4.3	90	12.8	150	21.4
31	21	22.8	21	26.3	20	24.3	31	4.4	91	13.0	151	21.5
32	21	23.0	21	26.6	20	24.6	32	4.6	92	13.1	152	21.7
33	21	23.3	21	26.8	20	24.8	33	4.7	93	13.3	153	21.8
34	21	23.5	21	27.1	20	25.0	34	4.8	94	13.4	154	21.9
35	21	23.8	21	27.3	20	25.3	35	5.0	95	13.5	155	22.1
36	21	24.0	21	27.6	20	25.5	36	5.1	96	13.7	156	22.2
37	21	24.3	21	27.8	20	25.7	37	5.3	97	13.8	157	22.4
38	21	24.5	21	28.1	20	26.0	38	5.4	98	14.0	158	22.5
39	21	24.8	21	28.3	20	26.2	39	5.6	99	14.1	159	22.7
40	21	25.0	21	28.6	20	26.5	40	5.7	100	14.3	160	22.8
41	21	25.3	21	28.8	20	26.7	41	5.8	101	14.4	161	22.9
42	21	25.5	21	29.1	20	26.9	42	6.0	102	14.5	162	23.1
43	21	25.8	21	29.3	20	27.2	43	6.1	103	14.7	163	23.2
44	21	26.0	21	29.6	20	27.4	44	6.3	104	14.8	164	23.4
45	21	26.3	21	29.8	20	27.7	45	6.4	105	15.0	165	23.5
46	21	26.5	21	30.1	20	27.9	46	6.6	106	15.1	166	23.7
47	21	26.8	21	30.3	20	28.1	47	6.7	107	15.2	167	23.8
48	21	27.0	21	30.6	20	28.4	48	6.8	108	15.4	168	23.9
49	21	27.3	21	30.8	20	28.6	49	7.0	109	15.5	169	24.1
50	21	27.5	21	31.1	20	28.8	50	7.1	110	15.7	170	24.2
51	21	27.8	21	31.3	20	29.1	51	7.3	111	15.8	171	24.4
52	21	28.0	21	31.6	20	29.3	52	7.4	112	16.0	172	24.5
53	21	28.3	21	31.8	20	29.6	53	7.6	113	16.1	173	24.7
54	21	28.5	21	32.1	20	29.8	54	7.7	114	16.2	174	24.8
55	21	28.8	21	32.3	20	30.0	55	7.8	115	16.4	175	24.9
56	21	29.0	21	32.6	20	30.3	56	8.0	116	16.5	176	25.1
57	21	29.3	21	32.8	20	30.5	57	8.1	117	16.7	177	25.2
58	21	29.5	21	33.1	20	30.8	58	8.3	118	16.8	178	25.4
59	21	29.8	21	33.3	20	31.0	59	8.4	119	17.0	179	25.5
60	21	30.0	21	33.6	20	31.2	60	8.6	120	17.1	180	25.7

1 h 26 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	21 30.0	21 33.6	20 31.2	0	.0	60	8.7	120	17.3
1	21 30.3	21 33.8	20 31.5	1	.1	61	8.8	121	17.4
2	21 30.5	21 34.1	20 31.7	2	.3	62	8.9	122	17.6
3	21 30.8	21 34.3	20 31.9	3	.4	63	9.1	123	17.7
4	21 31.0	21 34.6	20 32.2	4	.6	64	9.2	124	17.9
5	21 31.3	21 34.8	20 32.4	5	.7	65	9.4	125	18.0
6	21 31.5	21 35.1	20 32.7	6	.9	66	9.5	126	18.2
7	21 31.8	21 35.3	20 32.9	7	1.0	67	9.7	127	18.3
8	21 32.0	21 35.6	20 33.1	8	1.2	68	9.8	128	18.5
9	21 32.3	21 35.8	20 33.4	9	1.3	69	9.9	129	18.6
10	21 32.5	21 36.1	20 33.6	10	1.4	70	10.1	130	18.7
11	21 32.8	21 36.3	20 33.9	11	1.6	71	10.2	131	18.9
12	21 33.0	21 36.6	20 34.1	12	1.7	72	10.4	132	19.0
13	21 33.3	21 36.8	20 34.3	13	1.9	73	10.5	133	19.2
14	21 33.5	21 37.1	20 34.6	14	2.0	74	10.7	134	19.3
15	21 33.8	21 37.3	20 34.8	15	2.2	75	10.8	135	19.5
16	21 34.0	21 37.6	20 35.1	16	2.3	76	11.0	136	19.6
17	21 34.3	21 37.8	20 35.3	17	2.5	77	11.1	137	19.8
18	21 34.5	21 38.1	20 35.5	18	2.6	78	11.2	138	19.9
19	21 34.8	21 38.3	20 35.8	19	2.7	79	11.4	139	20.0
20	21 35.0	21 38.6	20 36.0	20	2.9	80	11.5	140	20.2
21	21 35.3	21 38.8	20 36.2	21	3.0	81	11.7	141	20.3
22	21 35.5	21 39.1	20 36.5	22	3.2	82	11.8	142	20.5
23	21 35.8	21 39.3	20 36.7	23	3.3	83	12.0	143	20.6
24	21 36.0	21 39.6	20 37.0	24	3.5	84	12.1	144	20.8
25	21 36.3	21 39.9	20 37.2	25	3.6	85	12.3	145	20.9
26	21 36.5	21 40.1	20 37.4	26	3.7	86	12.4	146	21.0
27	21 36.8	21 40.4	20 37.7	27	3.9	87	12.5	147	21.2
28	21 37.0	21 40.6	20 37.9	28	4.0	88	12.7	148	21.3
29	21 37.3	21 40.9	20 38.2	29	4.2	89	12.8	149	21.5
30	21 37.5	21 41.1	20 38.4	30	4.3	90	13.0	150	21.6
31	21 37.8	21 41.4	20 38.6	31	4.5	91	13.1	151	21.8
32	21 38.0	21 41.6	20 38.9	32	4.6	92	13.3	152	21.9
33	21 38.3	21 41.9	20 39.1	33	4.8	93	13.4	153	22.1
34	21 38.5	21 42.1	20 39.3	34	4.9	94	13.6	154	22.2
35	21 38.8	21 42.4	20 39.6	35	5.0	95	13.7	155	22.3
36	21 39.0	21 42.6	20 39.8	36	5.2	96	13.8	156	22.5
37	21 39.3	21 42.9	20 40.1	37	5.3	97	14.0	157	22.6
38	21 39.5	21 43.1	20 40.3	38	5.5	98	14.1	158	22.8
39	21 39.8	21 43.4	20 40.5	39	5.6	99	14.3	159	22.9
40	21 40.0	21 43.6	20 40.8	40	5.8	100	14.4	160	23.1
41	21 40.3	21 43.9	20 41.0	41	5.9	101	14.6	161	23.2
42	21 40.5	21 44.1	20 41.3	42	6.1	102	14.7	162	23.4
43	21 40.8	21 44.4	20 41.5	43	6.2	103	14.8	163	23.5
44	21 41.0	21 44.6	20 41.7	44	6.3	104	15.0	164	23.6
45	21 41.3	21 44.9	20 42.0	45	6.5	105	15.1	165	23.8
46	21 41.5	21 45.1	20 42.2	46	6.6	106	15.3	166	23.9
47	21 41.8	21 45.4	20 42.4	47	6.8	107	15.4	167	24.1
48	21 42.0	21 45.6	20 42.7	48	6.9	108	15.6	168	24.2
49	21 42.3	21 45.9	20 42.9	49	7.1	109	15.7	169	24.4
50	21 42.5	21 46.1	20 43.2	50	7.2	110	15.9	170	24.5
51	21 42.8	21 46.4	20 43.4	51	7.4	111	16.0	171	24.7
52	21 43.0	21 46.6	20 43.6	52	7.5	112	16.1	172	24.8
53	21 43.3	21 46.9	20 43.9	53	7.6	113	16.3	173	24.9
54	21 43.5	21 47.1	20 44.1	54	7.8	114	16.4	174	25.1
55	21 43.8	21 47.4	20 44.4	55	7.9	115	16.6	175	25.2
56	21 44.0	21 47.6	20 44.6	56	8.1	116	16.7	176	25.4
57	21 44.3	21 47.9	20 44.8	57	8.2	117	16.9	177	25.5
58	21 44.5	21 48.1	20 45.1	58	8.4	118	17.0	178	25.7
59	21 44.8	21 48.4	20 45.3	59	8.5	119	17.2	179	25.8
60	21 45.0	21 48.6	20 45.6	60	8.7	120	17.3	180	26.0

1 h 27 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	21 45.0	21 48.6	20 45.6	0	.0	60	8.8	120	17.5
1	21 45.3	21 48.9	20 45.8	1	.1	61	8.9	121	17.6
2	21 45.5	21 49.1	20 46.0	2	.3	62	9.0	122	17.8
3	21 45.8	21 49.4	20 46.3	3	.4	63	9.2	123	17.9
4	21 46.0	21 49.6	20 46.5	4	.6	64	9.3	124	18.1
5	21 46.3	21 49.9	20 46.7	5	.7	65	9.5	125	18.2
6	21 46.5	21 50.1	20 47.0	6	.9	66	9.6	126	18.4
7	21 46.8	21 50.4	20 47.2	7	1.0	67	9.8	127	18.5
8	21 47.0	21 50.6	20 47.5	8	1.2	68	9.9	128	18.7
9	21 47.3	21 50.9	20 47.7	9	1.3	69	10.1	129	18.8
10	21 47.5	21 51.1	20 47.9	10	1.5	70	10.2	130	19.0
11	21 47.8	21 51.4	20 48.2	11	1.6	71	10.4	131	19.1
12	21 48.0	21 51.6	20 48.4	12	1.8	72	10.5	132	19.3
13	21 48.3	21 51.9	20 48.7	13	1.9	73	10.6	133	19.4
14	21 48.5	21 52.1	20 48.9	14	2.0	74	10.8	134	19.5
15	21 48.8	21 52.4	20 49.1	15	2.2	75	10.9	135	19.7
16	21 49.0	21 52.6	20 49.4	16	2.3	76	11.1	136	19.8
17	21 49.3	21 52.9	20 49.6	17	2.5	77	11.2	137	20.0
18	21 49.5	21 53.1	20 49.8	18	2.6	78	11.4	138	20.1
19	21 49.8	21 53.4	20 50.1	19	2.8	79	11.5	139	20.3
20	21 50.0	21 53.6	20 50.3	20	2.9	80	11.7	140	20.4
21	21 50.3	21 53.9	20 50.6	21	3.1	81	11.8	141	20.6
22	21 50.5	21 54.1	20 50.8	22	3.2	82	12.0	142	20.7
23	21 50.8	21 54.4	20 51.0	23	3.4	83	12.1	143	20.9
24	21 51.0	21 54.6	20 51.3	24	3.5	84	12.3	144	21.0
25	21 51.3	21 54.9	20 51.5	25	3.6	85	12.4	145	21.1
26	21 51.5	21 55.1	20 51.8	26	3.8	86	12.5	146	21.3
27	21 51.8	21 55.4	20 52.0	27	3.9	87	12.7	147	21.4
28	21 52.0	21 55.6	20 52.2	28	4.1	88	12.8	148	21.6
29	21 52.3	21 55.9	20 52.5	29	4.2	89	13.0	149	21.7
30	21 52.5	21 56.1	20 52.7	30	4.4	90	13.1	150	21.9
31	21 52.8	21 56.4	20 52.9	31	4.5	91	13.3	151	22.0
32	21 53.0	21 56.6	20 53.2	32	4.7	92	13.4	152	22.2
33	21 53.3	21 56.9	20 53.4	33	4.8	93	13.6	153	22.3
34	21 53.5	21 57.1	20 53.7	34	5.0	94	13.7	154	22.5
35	21 53.8	21 57.4	20 53.9	35	5.1	95	13.9	155	22.6
36	21 54.0	21 57.7	20 54.1	36	5.3	96	14.0	156	22.8
37	21 54.3	21 57.9	20 54.4	37	5.4	97	14.1	157	22.9
38	21 54.5	21 58.2	20 54.6	38	5.5	98	14.3	158	23.0
39	21 54.8	21 58.4	20 54.9	39	5.7	99	14.4	159	23.2
40	21 55.0	21 58.7	20 55.1	40	5.8	100	14.6	160	23.3
41	21 55.3	21 58.9	20 55.3	41	6.0	101	14.7	161	23.5
42	21 55.5	21 59.2	20 55.6	42	6.1	102	14.9	162	23.6
43	21 55.8	21 59.4	20 55.8	43	6.3	103	15.0	163	23.8
44	21 56.0	21 59.7	20 56.0	44	6.4	104	15.2	164	23.9
45	21 56.3	21 59.9	20 56.3	45	6.6	105	15.3	165	24.1
46	21 56.5	22 .2	20 56.5	46	6.7	106	15.5	166	24.2
47	21 56.8	22 .4	20 56.8	47	6.9	107	15.6	167	24.4
48	21 57.0	22 .7	20 57.0	48	7.0	108	15.8	168	24.5
49	21 57.3	22 .9	20 57.2	49	7.1	109	15.9	169	24.6
50	21 57.5	22 1.2	20 57.5	50	7.3	110	16.0	170	24.8
51	21 57.8	22 1.4	20 57.7	51	7.4	111	16.2	171	24.9
52	21 58.0	22 1.7	20 58.0	52	7.6	112	16.3	172	25.1
53	21 58.3	22 1.9	20 58.2	53	7.7	113	16.5	173	25.2
54	21 58.5	22 2.2	20 58.4	54	7.9	114	16.6	174	25.4
55	21 58.8	22 2.4	20 58.7	55	8.0	115	16.8	175	25.5
56	21 59.0	22 2.7	20 58.9	56	8.2	116	16.9	176	25.7
57	21 59.3	22 2.9	20 59.2	57	8.3	117	17.1	177	25.8
58	21 59.5	22 3.2	20 59.4	58	8.5	118	17.2	178	26.0
59	21 59.8	22 3.4	20 59.6	59	8.6	119	17.4	179	26.1
60	22 .0	22 3.7	20 59.9	60	8.8	120	17.5	180	26.3

1 h 28 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′	′		′		′
0	22	.0	22	3.7	20	59.9	0	.0	60	8.9	120	17.7
1	22	.3	22	3.9	21	.1	1	.1	61	9.0	121	17.8
2	22	.5	22	4.2	21	.3	2	.3	62	9.1	122	18.0
3	22	.8	22	4.4	21	.6	3	.4	63	9.3	123	18.1
4	22	1.0	22	4.7	21	.8	4	.6	64	9.4	124	18.3
5	22	1.3	22	4.9	21	1.1	5	.7	65	9.6	125	18.4
6	22	1.5	22	5.2	21	1.3	6	.9	66	9.7	126	18.6
7	22	1.8	22	5.4	21	1.5	7	1.0	67	9.9	127	18.7
8	22	2.0	22	5.7	21	1.8	8	1.2	68	10.0	128	18.9
9	22	2.3	22	5.9	21	2.0	9	1.3	69	10.2	129	19.0
10	22	2.5	22	6.2	21	2.3	10	1.5	70	10.3	130	19.2
11	22	2.8	22	6.4	21	2.5	11	1.6	71	10.5	131	19.3
12	22	3.0	22	6.7	21	2.7	12	1.8	72	10.6	132	19.5
13	22	3.3	22	6.9	21	3.0	13	1.9	73	10.8	133	19.6
14	22	3.5	22	7.2	21	3.2	14	2.1	74	10.9	134	19.8
15	22	3.8	22	7.4	21	3.4	15	2.2	75	11.1	135	19.9
16	22	4.0	22	7.7	21	3.7	16	2.4	76	11.2	136	20.1
17	22	4.3	22	7.9	21	3.9	17	2.5	77	11.4	137	20.2
18	22	4.5	22	8.2	21	4.2	18	2.7	78	11.5	138	20.4
19	22	4.8	22	8.4	21	4.4	19	2.8	79	11.7	139	20.5
20	22	5.0	22	8.7	21	4.6	20	3.0	80	11.8	140	20.7
21	22	5.3	22	8.9	21	4.9	21	3.1	81	11.9	141	20.8
22	22	5.5	22	9.2	21	5.1	22	3.2	82	12.1	142	20.9
23	22	5.8	22	9.4	21	5.4	23	3.4	83	12.2	143	21.1
24	22	6.0	22	9.7	21	5.6	24	3.5	84	12.4	144	21.2
25	22	6.3	22	9.9	21	5.8	25	3.7	85	12.5	145	21.4
26	22	6.5	22	10.2	21	6.1	26	3.8	86	12.7	146	21.5
27	22	6.8	22	10.4	21	6.3	27	4.0	87	12.8	147	21.7
28	22	7.0	22	10.7	21	6.5	28	4.1	88	13.0	148	21.8
29	22	7.3	22	10.9	21	6.8	29	4.3	89	13.1	149	22.0
30	22	7.5	22	11.2	21	7.0	30	4.4	90	13.3	150	22.1
31	22	7.8	22	11.4	21	7.3	31	4.6	91	13.4	151	22.3
32	22	8.0	22	11.7	21	7.5	32	4.7	92	13.6	152	22.4
33	22	8.3	22	11.9	21	7.7	33	4.9	93	13.7	153	22.6
34	22	8.5	22	12.2	21	8.0	34	5.0	94	13.9	154	22.7
35	22	8.8	22	12.4	21	8.2	35	5.2	95	14.0	155	22.9
36	22	9.0	22	12.7	21	8.5	36	5.3	96	14.2	156	23.0
37	22	9.3	22	12.9	21	8.7	37	5.5	97	14.3	157	23.2
38	22	9.5	22	13.2	21	8.9	38	5.6	98	14.5	158	23.3
39	22	9.8	22	13.4	21	9.2	39	5.8	99	14.6	159	23.5
40	22	10.0	22	13.7	21	9.4	40	5.9	100	14.8	160	23.6
41	22	10.3	22	13.9	21	9.6	41	6.0	101	14.9	161	23.7
42	22	10.5	22	14.2	21	9.9	42	6.2	102	15.0	162	23.9
43	22	10.8	22	14.4	21	10.1	43	6.3	103	15.2	163	24.0
44	22	11.0	22	14.7	21	10.4	44	6.5	104	15.3	164	24.2
45	22	11.3	22	14.9	21	10.6	45	6.6	105	15.5	165	24.3
46	22	11.5	22	15.2	21	10.8	46	6.8	106	15.6	166	24.5
47	22	11.8	22	15.4	21	11.1	47	6.9	107	15.8	167	24.6
48	22	12.0	22	15.7	21	11.3	48	7.1	108	15.9	168	24.8
49	22	12.3	22	16.0	21	11.6	49	7.2	109	16.1	169	24.9
50	22	12.5	22	16.2	21	11.8	50	7.4	110	16.2	170	25.1
51	22	12.8	22	16.5	21	12.0	51	7.5	111	16.4	171	25.2
52	22	13.0	22	16.7	21	12.3	52	7.7	112	16.5	172	25.4
53	22	13.3	22	17.0	21	12.5	53	7.8	113	16.7	173	25.5
54	22	13.5	22	17.2	21	12.8	54	8.0	114	16.8	174	25.7
55	22	13.8	22	17.5	21	13.0	55	8.1	115	17.0	175	25.8
56	22	14.0	22	17.7	21	13.2	56	8.3	116	17.1	176	26.0
57	22	14.3	22	18.0	21	13.5	57	8.4	117	17.3	177	26.1
58	22	14.5	22	18.2	21	13.7	58	8.6	118	17.4	178	26.3
59	22	14.8	22	18.5	21	13.9	59	8.7	119	17.6	179	26.4
60	22	15.0	22	18.7	21	14.2	60	8.9	120	17.7	180	26.6

1 h 29 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′	′		′		′
0	22	15.0	22	18.7	21	14.2	0	.0	60	9.0	120	17.9
1	22	15.3	22	19.0	21	14.4	1	.1	61	9.1	121	18.0
2	22	15.5	22	19.2	21	14.7	2	.3	62	9.2	122	18.2
3	22	15.8	22	19.5	21	14.9	3	.4	63	9.4	123	18.3
4	22	16.0	22	19.7	21	15.1	4	.6	64	9.5	124	18.5
5	22	16.3	22	20.0	21	15.4	5	.7	65	9.7	125	18.6
6	22	16.5	22	20.2	21	15.6	6	.9	66	9.8	126	18.8
7	22	16.8	22	20.5	21	15.9	7	1.0	67	10.0	127	18.9
8	22	17.0	22	20.7	21	16.1	8	1.2	68	10.1	128	19.1
9	22	17.3	22	21.0	21	16.3	9	1.3	69	10.3	129	19.2
10	22	17.5	22	21.2	21	16.6	10	1.5	70	10.4	130	19.4
11	22	17.8	22	21.5	21	16.8	11	1.6	71	10.6	131	19.5
12	22	18.0	22	21.7	21	17.0	12	1.8	72	10.7	132	19.7
13	22	18.3	22	22.0	21	17.3	13	1.9	73	10.9	133	19.8
14	22	18.5	22	22.2	21	17.5	14	2.1	74	11.0	134	20.0
15	22	18.8	22	22.5	21	17.8	15	2.2	75	11.2	135	20.1
16	22	19.0	22	22.7	21	18.0	16	2.4	76	11.3	136	20.3
17	22	19.3	22	23.0	21	18.2	17	2.5	77	11.5	137	20.4
18	22	19.5	22	23.2	21	18.5	18	2.7	78	11.6	138	20.6
19	22	19.8	22	23.5	21	18.7	19	2.8	79	11.8	139	20.7
20	22	20.0	22	23.7	21	19.0	20	3.0	80	11.9	140	20.9
21	22	20.3	22	24.0	21	19.2	21	3.1	81	12.1	141	21.0
22	22	20.5	22	24.2	21	19.4	22	3.3	82	12.2	142	21.2
23	22	20.8	22	24.5	21	19.7	23	3.4	83	12.4	143	21.3
24	22	21.0	22	24.7	21	19.9	24	3.6	84	12.5	144	21.5
25	22	21.3	22	25.0	21	20.1	25	3.7	85	12.7	145	21.6
26	22	21.5	22	25.2	21	20.4	26	3.9	86	12.8	146	21.8
27	22	21.8	22	25.5	21	20.6	27	4.0	87	13.0	147	21.9
28	22	22.0	22	25.7	21	20.9	28	4.2	88	13.1	148	22.1
29	22	22.3	22	26.0	21	21.1	29	4.3	89	13.3	149	22.2
30	22	22.5	22	26.2	21	21.3	30	4.5	90	13.4	150	22.4
31	22	22.8	22	26.5	21	21.6	31	4.6	91	13.6	151	22.5
32	22	23.0	22	26.7	21	21.8	32	4.8	92	13.7	152	22.7
33	22	23.3	22	27.0	21	22.1	33	4.9	93	13.9	153	22.8
34	22	23.5	22	27.2	21	22.3	34	5.1	94	14.0	154	23.0
35	22	23.8	22	27.5	21	22.5	35	5.2	95	14.2	155	23.1
36	22	24.0	22	27.7	21	22.8	36	5.4	96	14.3	156	23.3
37	22	24.3	22	28.0	21	23.0	37	5.5	97	14.5	157	23.4
38	22	24.5	22	28.2	21	23.3	38	5.7	98	14.6	158	23.6
39	22	24.8	22	28.5	21	23.5	39	5.8	99	14.8	159	23.7
40	22	25.0	22	28.7	21	23.7	40	6.0	100	14.9	160	23.9
41	22	25.3	22	29.0	21	24.0	41	6.1	101	15.1	161	24.0
42	22	25.5	22	29.2	21	24.2	42	6.3	102	15.2	162	24.2
43	22	25.8	22	29.5	21	24.4	43	6.4	103	15.4	163	24.3
44	22	26.0	22	29.7	21	24.7	44	6.6	104	15.5	164	24.5
45	22	26.3	22	30.0	21	24.9	45	6.7	105	15.7	165	24.6
46	22	26.5	22	30.2	21	25.2	46	6.9	106	15.8	166	24.8
47	22	26.8	22	30.5	21	25.4	47	7.0	107	16.0	167	24.9
48	22	27.0	22	30.7	21	25.6	48	7.2	108	16.1	168	25.1
49	22	27.3	22	31.0	21	25.9	49	7.3	109	16.3	169	25.2
50	22	27.5	22	31.2	21	26.1	50	7.5	110	16.4	170	25.4
51	22	27.8	22	31.5	21	26.4	51	7.6	111	16.6	171	25.5
52	22	28.0	22	31.7	21	26.6	52	7.8	112	16.7	172	25.7
53	22	28.3	22	32.0	21	26.8	53	7.9	113	16.9	173	25.8
54	22	28.5	22	32.2	21	27.1	54	8.1	114	17.0	174	26.0
55	22	28.8	22	32.5	21	27.3	55	8.2	115	17.2	175	26.1
56	22	29.0	22	32.7	21	27.5	56	8.4	116	17.3	176	26.3
57	22	29.3	22	33.0	21	27.8	57	8.5	117	17.5	177	26.4
58	22	29.5	22	33.2	21	28.0	58	8.7	118	17.6	178	26.6
59	22	29.8	22	33.5	21	28.3	59	8.8	119	17.8	179	26.7
60	22	30.0	22	33.8	21	28.5	60	9.0	120	17.9	180	26.9

1 h 30 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 30.0	22 33.8	21 28.5	0	.0	60	9.1	120	18.1
1	22 30.3	22 34.0	21 28.7	1	.2	61	9.2	121	18.3
2	22 30.5	22 34.3	21 29.0	2	.3	62	9.4	122	18.4
3	22 30.8	22 34.5	21 29.2	3	.5	63	9.5	123	18.6
4	22 31.0	22 34.8	21 29.5	4	.6	64	9.7	124	18.7
5	22 31.3	22 35.0	21 29.7	5	.8	65	9.8	125	18.9
6	22 31.5	22 35.3	21 29.9	6	.9	66	10.0	126	19.0
7	22 31.8	22 35.5	21 30.2	7	1.1	67	10.1	127	19.2
8	22 32.0	22 35.8	21 30.4	8	1.2	68	10.3	128	19.3
9	22 32.3	22 36.0	21 30.6	9	1.4	69	10.4	129	19.5
10	22 32.5	22 36.3	21 30.9	10	1.5	70	10.6	130	19.6
11	22 32.8	22 36.5	21 31.1	11	1.7	71	10.7	131	19.8
12	22 33.0	22 36.8	21 31.4	12	1.8	72	10.9	132	19.9
13	22 33.3	22 37.0	21 31.6	13	2.0	73	11.0	133	20.1
14	22 33.5	22 37.3	21 31.8	14	2.1	74	11.2	134	20.2
15	22 33.8	22 37.5	21 32.1	15	2.3	75	11.3	135	20.4
16	22 34.0	22 37.8	21 32.3	16	2.4	76	11.5	136	20.5
17	22 34.3	22 38.0	21 32.6	17	2.6	77	11.6	137	20.7
18	22 34.5	22 38.3	21 32.8	18	2.7	78	11.8	138	20.8
19	22 34.8	22 38.5	21 33.0	19	2.9	79	11.9	139	21.0
20	22 35.0	22 38.8	21 33.3	20	3.0	80	12.1	140	21.1
21	22 35.3	22 39.0	21 33.5	21	3.2	81	12.2	141	21.3
22	22 35.5	22 39.3	21 33.7	22	3.3	82	12.4	142	21.4
23	22 35.8	22 39.5	21 34.0	23	3.5	83	12.5	143	21.6
24	22 36.0	22 39.8	21 34.2	24	3.6	84	12.7	144	21.7
25	22 36.3	22 40.0	21 34.5	25	3.8	85	12.8	145	21.9
26	22 36.5	22 40.3	21 34.7	26	3.9	86	13.0	146	22.0
27	22 36.8	22 40.5	21 34.9	27	4.1	87	13.1	147	22.2
28	22 37.0	22 40.8	21 35.2	28	4.2	88	13.3	148	22.3
29	22 37.3	22 41.0	21 35.4	29	4.4	89	13.4	149	22.5
30	22 37.5	22 41.3	21 35.7	30	4.5	90	13.6	150	22.6
31	22 37.8	22 41.5	21 35.9	31	4.7	91	13.7	151	22.8
32	22 38.0	22 41.8	21 36.1	32	4.8	92	13.9	152	22.9
33	22 38.3	22 42.0	21 36.4	33	5.0	93	14.0	153	23.1
34	22 38.5	22 42.3	21 36.6	34	5.1	94	14.2	154	23.2
35	22 38.8	22 42.5	21 36.9	35	5.3	95	14.3	155	23.4
36	22 39.0	22 42.8	21 37.1	36	5.4	96	14.5	156	23.5
37	22 39.3	22 43.0	21 37.3	37	5.6	97	14.6	157	23.7
38	22 39.5	22 43.3	21 37.6	38	5.7	98	14.8	158	23.8
39	22 39.8	22 43.5	21 37.8	39	5.9	99	14.9	159	24.0
40	22 40.0	22 43.8	21 38.0	40	6.0	100	15.1	160	24.1
41	22 40.3	22 44.0	21 38.3	41	6.2	101	15.2	161	24.3
42	22 40.5	22 44.3	21 38.5	42	6.3	102	15.4	162	24.4
43	22 40.8	22 44.5	21 38.8	43	6.5	103	15.5	163	24.6
44	22 41.0	22 44.8	21 39.0	44	6.6	104	15.7	164	24.7
45	22 41.3	22 45.0	21 39.2	45	6.8	105	15.8	165	24.9
46	22 41.5	22 45.3	21 39.5	46	6.9	106	16.0	166	25.0
47	22 41.8	22 45.5	21 39.7	47	7.1	107	16.1	167	25.2
48	22 42.0	22 45.8	21 40.0	48	7.2	108	16.3	168	25.3
49	22 42.3	22 46.0	21 40.2	49	7.4	109	16.4	169	25.5
50	22 42.5	22 46.3	21 40.4	50	7.5	110	16.6	170	25.6
51	22 42.8	22 46.5	21 40.7	51	7.7	111	16.7	171	25.8
52	22 43.0	22 46.8	21 40.9	52	7.8	112	16.9	172	25.9
53	22 43.3	22 47.0	21 41.1	53	8.0	113	17.0	173	26.1
54	22 43.5	22 47.3	21 41.4	54	8.1	114	17.2	174	26.2
55	22 43.8	22 47.5	21 41.6	55	8.3	115	17.3	175	26.4
56	22 44.0	22 47.8	21 41.9	56	8.4	116	17.5	176	26.5
57	22 44.3	22 48.0	21 42.1	57	8.6	117	17.6	177	26.7
58	22 44.5	22 48.3	21 42.3	58	8.7	118	17.8	178	26.8
59	22 44.8	22 48.5	21 42.6	59	8.9	119	17.9	179	27.0
60	22 45.0	22 48.8	21 42.8	60	9.1	120	18.1	180	27.2

1 h 31 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	22 45.0	22 48.8	21 42.8	0	.0	60	9.2	120	18.3
1	22 45.3	22 49.0	21 43.1	1	.2	61	9.3	121	18.5
2	22 45.5	22 49.3	21 43.3	2	.3	62	9.5	122	18.6
3	22 45.8	22 49.5	21 43.5	3	.5	63	9.6	123	18.8
4	22 46.0	22 49.8	21 43.8	4	.6	64	9.8	124	18.9
5	22 46.3	22 50.0	21 44.0	5	.8	65	9.9	125	19.1
6	22 46.5	22 50.3	21 44.2	6	.9	66	10.1	126	19.2
7	22 46.8	22 50.5	21 44.5	7	1.1	67	10.2	127	19.4
8	22 47.0	22 50.8	21 44.7	8	1.2	68	10.4	128	19.5
9	22 47.3	22 51.0	21 45.0	9	1.4	69	10.5	129	19.7
10	22 47.5	22 51.3	21 45.2	10	1.5	70	10.7	130	19.8
11	22 47.8	22 51.5	21 45.4	11	1.7	71	10.8	131	20.0
12	22 48.0	22 51.8	21 45.7	12	1.8	72	11.0	132	20.1
13	22 48.3	22 52.1	21 45.9	13	2.0	73	11.1	133	20.3
14	22 48.5	22 52.3	21 46.2	14	2.1	74	11.3	134	20.4
15	22 48.8	22 52.6	21 46.4	15	2.3	75	11.4	135	20.6
16	22 49.0	22 52.8	21 46.6	16	2.4	76	11.6	136	20.7
17	22 49.3	22 53.1	21 46.9	17	2.6	77	11.7	137	20.9
18	22 49.5	22 53.3	21 47.1	18	2.7	78	11.9	138	21.0
19	22 49.8	22 53.6	21 47.4	19	2.9	79	12.0	139	21.2
20	22 50.0	22 53.8	21 47.6	20	3.1	80	12.2	140	21.4
21	22 50.3	22 54.1	21 47.8	21	3.2	81	12.4	141	21.5
22	22 50.5	22 54.3	21 48.1	22	3.4	82	12.5	142	21.7
23	22 50.8	22 54.6	21 48.3	23	3.5	83	12.7	143	21.8
24	22 51.0	22 54.8	21 48.5	24	3.7	84	12.8	144	22.0
25	22 51.3	22 55.1	21 48.8	25	3.8	85	13.0	145	22.1
26	22 51.5	22 55.3	21 49.0	26	4.0	86	13.1	146	22.3
27	22 51.8	22 55.6	21 49.3	27	4.1	87	13.3	147	22.4
28	22 52.0	22 55.8	21 49.5	28	4.3	88	13.4	148	22.6
29	22 52.3	22 56.1	21 49.7	29	4.4	89	13.6	149	22.7
30	22 52.5	22 56.3	21 50.0	30	4.6	90	13.7	150	22.9
31	22 52.8	22 56.6	21 50.2	31	4.7	91	13.9	151	23.0
32	22 53.0	22 56.8	21 50.5	32	4.9	92	14.0	152	23.2
33	22 53.3	22 57.1	21 50.7	33	5.0	93	14.2	153	23.3
34	22 53.5	22 57.3	21 50.9	34	5.2	94	14.3	154	23.5
35	22 53.8	22 57.6	21 51.2	35	5.3	95	14.5	155	23.6
36	22 54.0	22 57.8	21 51.4	36	5.5	96	14.6	156	23.8
37	22 54.3	22 58.1	21 51.6	37	5.6	97	14.8	157	23.9
38	22 54.5	22 58.3	21 51.9	38	5.8	98	14.9	158	24.1
39	22 54.8	22 58.6	21 52.1	39	5.9	99	15.1	159	24.2
40	22 55.0	22 58.8	21 52.4	40	6.1	100	15.3	160	24.4
41	22 55.3	22 59.1	21 52.6	41	6.3	101	15.4	161	24.6
42	22 55.5	22 59.3	21 52.8	42	6.4	102	15.6	162	24.7
43	22 55.8	22 59.6	21 53.1	43	6.6	103	15.7	163	24.9
44	22 56.0	22 59.8	21 53.3	44	6.7	104	15.9	164	25.0
45	22 56.3	23 .1	21 53.6	45	6.9	105	16.0	165	25.2
46	22 56.5	23 .3	21 53.8	46	7.0	106	16.2	166	25.3
47	22 56.8	23 .6	21 54.0	47	7.2	107	16.3	167	25.5
48	22 57.0	23 .8	21 54.3	48	7.3	108	16.5	168	25.6
49	22 57.3	23 1.1	21 54.5	49	7.5	109	16.6	169	25.8
50	22 57.5	23 1.3	21 54.7	50	7.6	110	16.8	170	25.9
51	22 57.8	23 1.6	21 55.0	51	7.8	111	16.9	171	26.1
52	22 58.0	23 1.8	21 55.2	52	7.9	112	17.1	172	26.2
53	22 58.3	23 2.1	21 55.5	53	8.1	113	17.2	173	26.4
54	22 58.5	23 2.3	21 55.7	54	8.2	114	17.4	174	26.5
55	22 58.8	23 2.6	21 55.9	55	8.4	115	17.5	175	26.7
56	22 59.0	23 2.8	21 56.2	56	8.5	116	17.7	176	26.8
57	22 59.3	23 3.1	21 56.4	57	8.7	117	17.8	177	27.0
58	22 59.5	23 3.3	21 56.7	58	8.8	118	18.0	178	27.1
59	22 59.8	23 3.6	21 56.9	59	9.0	119	18.1	179	27.3
60	23 .0	23 3.8	21 57.1	60	9.2	120	18.3	180	27.5

1 h 32 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	23	.0	23	3.8	21	57.1	0	.0	60	9.3	120	18.5
1	23	.3	23	4.1	21	57.4	1	.2	61	9.4	121	18.7
2	23	.5	23	4.3	21	57.6	2	.3	62	9.6	122	18.8
3	23	.8	23	4.6	21	57.8	3	.5	63	9.7	123	19.0
4	23	1.0	23	4.8	21	58.1	4	.6	64	9.9	124	19.1
5	23	1.3	23	5.1	21	58.3	5	.8	65	10.0	125	19.3
6	23	1.5	23	5.3	21	58.6	6	.9	66	10.2	126	19.4
7	23	1.8	23	5.6	21	58.8	7	1.1	67	10.3	127	19.6
8	23	2.0	23	5.8	21	59.0	8	1.2	68	10.5	128	19.7
9	23	2.3	23	6.1	21	59.3	9	1.4	69	10.6	129	19.9
10	23	2.5	23	6.3	21	59.5	10	1.5	70	10.8	130	20.0
11	23	2.8	23	6.6	21	59.8	11	1.7	71	10.9	131	20.2
12	23	3.0	23	6.8	21	60.0	12	1.9	72	11.1	132	20.4
13	23	3.3	23	7.1	22	.2	13	2.0	73	11.3	133	20.5
14	23	3.5	23	7.3	22	.5	14	2.2	74	11.4	134	20.7
15	23	3.8	23	7.6	22	.7	15	2.3	75	11.6	135	20.8
16	23	4.0	23	7.8	22	1.0	16	2.5	76	11.7	136	21.0
17	23	4.3	23	8.1	22	1.2	17	2.6	77	11.9	137	21.1
18	23	4.5	23	8.3	22	1.4	18	2.8	78	12.0	138	21.3
19	23	4.8	23	8.6	22	1.7	19	2.9	79	12.2	139	21.4
20	23	5.0	23	8.8	22	1.9	20	3.1	80	12.3	140	21.6
21	23	5.3	23	9.1	22	2.1	21	3.2	81	12.5	141	21.7
22	23	5.5	23	9.3	22	2.4	22	3.4	82	12.6	142	21.9
23	23	5.8	23	9.6	22	2.6	23	3.5	83	12.8	143	22.0
24	23	6.0	23	9.9	22	2.9	24	3.7	84	13.0	144	22.2
25	23	6.3	23	10.1	22	3.1	25	3.9	85	13.1	145	22.4
26	23	6.5	23	10.4	22	3.3	26	4.0	86	13.3	146	22.5
27	23	6.8	23	10.6	22	3.6	27	4.2	87	13.4	147	22.7
28	23	7.0	23	10.9	22	3.8	28	4.3	88	13.6	148	22.8
29	23	7.3	23	11.1	22	4.1	29	4.5	89	13.7	149	23.0
30	23	7.5	23	11.4	22	4.3	30	4.6	90	13.9	150	23.1
31	23	7.8	23	11.6	22	4.5	31	4.8	91	14.0	151	23.3
32	23	8.0	23	11.9	22	4.8	32	4.9	92	14.2	152	23.4
33	23	8.3	23	12.1	22	5.0	33	5.1	93	14.3	153	23.6
34	23	8.5	23	12.4	22	5.2	34	5.2	94	14.5	154	23.7
35	23	8.8	23	12.6	22	5.5	35	5.4	95	14.6	155	23.9
36	23	9.0	23	12.9	22	5.7	36	5.6	96	14.8	156	24.1
37	23	9.3	23	13.1	22	6.0	37	5.7	97	15.0	157	24.2
38	23	9.5	23	13.4	22	6.2	38	5.9	98	15.1	158	24.4
39	23	9.8	23	13.6	22	6.4	39	6.0	99	15.3	159	24.5
40	23	10.0	23	13.9	22	6.7	40	6.2	100	15.4	160	24.7
41	23	10.3	23	14.1	22	6.9	41	6.3	101	15.6	161	24.8
42	23	10.5	23	14.4	22	7.2	42	6.5	102	15.7	162	25.0
43	23	10.8	23	14.6	22	7.4	43	6.6	103	15.9	163	25.1
44	23	11.0	23	14.9	22	7.6	44	6.8	104	16.0	164	25.3
45	23	11.3	23	15.1	22	7.9	45	6.9	105	16.2	165	25.4
46	23	11.5	23	15.4	22	8.1	46	7.1	106	16.3	166	25.6
47	23	11.8	23	15.6	22	8.3	47	7.2	107	16.5	167	25.7
48	23	12.0	23	15.9	22	8.6	48	7.4	108	16.7	168	25.9
49	23	12.3	23	16.1	22	8.8	49	7.6	109	16.8	169	26.1
50	23	12.5	23	16.4	22	9.1	50	7.7	110	17.0	170	26.2
51	23	12.8	23	16.6	22	9.3	51	7.9	111	17.1	171	26.4
52	23	13.0	23	16.9	22	9.5	52	8.0	112	17.3	172	26.5
53	23	13.3	23	17.1	22	9.8	53	8.2	113	17.4	173	26.7
54	23	13.5	23	17.4	22	10.0	54	8.3	114	17.6	174	26.8
55	23	13.8	23	17.6	22	10.3	55	8.5	115	17.7	175	27.0
56	23	14.0	23	17.9	22	10.5	56	8.6	116	17.9	176	27.1
57	23	14.3	23	18.1	22	10.7	57	8.8	117	18.0	177	27.3
58	23	14.5	23	18.4	22	11.0	58	8.9	118	18.2	178	27.4
59	23	14.8	23	18.6	22	11.2	59	9.1	119	18.3	179	27.6
60	23	15.0	23	18.9	22	11.5	60	9.3	120	18.5	180	27.8

1 h 33 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	23	15.0	23	18.9	22	11.5	0	.0	60	9.4	120	18.7
1	23	15.3	23	19.1	22	11.7	1	.2	61	9.5	121	18.9
2	23	15.5	23	19.4	22	11.9	2	.3	62	9.7	122	19.0
3	23	15.8	23	19.6	22	12.2	3	.5	63	9.8	123	19.2
4	23	16.0	23	19.9	22	12.4	4	.6	64	10.0	124	19.3
5	23	16.3	23	20.1	22	12.6	5	.8	65	10.1	125	19.5
6	23	16.5	23	20.4	22	12.9	6	.9	66	10.3	126	19.6
7	23	16.8	23	20.6	22	13.1	7	1.1	67	10.4	127	19.8
8	23	17.0	23	20.9	22	13.4	8	1.2	68	10.6	128	19.9
9	23	17.3	23	21.1	22	13.6	9	1.4	69	10.8	129	20.1
10	23	17.5	23	21.4	22	13.8	10	1.6	70	10.9	130	20.3
11	23	17.8	23	21.6	22	14.1	11	1.7	71	11.1	131	20.4
12	23	18.0	23	21.9	22	14.3	12	1.9	72	11.2	132	20.6
13	23	18.3	23	22.1	22	14.6	13	2.0	73	11.4	133	20.7
14	23	18.5	23	22.4	22	14.8	14	2.2	74	11.5	134	20.9
15	23	18.8	23	22.6	22	15.0	15	2.3	75	11.7	135	21.0
16	23	19.0	23	22.9	22	15.3	16	2.5	76	11.8	136	21.2
17	23	19.3	23	23.1	22	15.5	17	2.6	77	12.0	137	21.3
18	23	19.5	23	23.4	22	15.7	18	2.8	78	12.2	138	21.5
19	23	19.8	23	23.6	22	16.0	19	3.0	79	12.3	139	21.7
20	23	20.0	23	23.9	22	16.2	20	3.1	80	12.5	140	21.8
21	23	20.3	23	24.1	22	16.5	21	3.3	81	12.6	141	22.0
22	23	20.5	23	24.4	22	16.7	22	3.4	82	12.8	142	22.1
23	23	20.8	23	24.6	22	16.9	23	3.6	83	12.9	143	22.3
24	23	21.0	23	24.9	22	17.2	24	3.7	84	13.1	144	22.4
25	23	21.3	23	25.1	22	17.4	25	3.9	85	13.2	145	22.6
26	23	21.5	23	25.4	22	17.7	26	4.1	86	13.4	146	22.8
27	23	21.8	23	25.6	22	17.9	27	4.2	87	13.6	147	22.9
28	23	22.0	23	25.9	22	18.1	28	4.4	88	13.7	148	23.1
29	23	22.3	23	26.1	22	18.4	29	4.5	89	13.9	149	23.2
30	23	22.5	23	26.4	22	18.6	30	4.7	90	14.0	150	23.4
31	23	22.8	23	26.6	22	18.8	31	4.8	91	14.2	151	23.5
32	23	23.0	23	26.9	22	19.1	32	5.0	92	14.3	152	23.7
33	23	23.3	23	27.1	22	19.3	33	5.1	93	14.5	153	23.8
34	23	23.5	23	27.4	22	19.6	34	5.3	94	14.6	154	24.0
35	23	23.8	23	27.6	22	19.8	35	5.5	95	14.8	155	24.2
36	23	24.0	23	27.9	22	20.0	36	5.6	96	15.0	156	24.3
37	23	24.3	23	28.2	22	20.3	37	5.8	97	15.1	157	24.5
38	23	24.5	23	28.4	22	20.5	38	5.9	98	15.3	158	24.6
39	23	24.8	23	28.7	22	20.8	39	6.1	99	15.4	159	24.8
40	23	25.0	23	28.9	22	21.0	40	6.2	100	15.6	160	24.9
41	23	25.3	23	29.2	22	21.2	41	6.4	101	15.7	161	25.1
42	23	25.5	23	29.4	22	21.5	42	6.5	102	15.9	162	25.2
43	23	25.8	23	29.7	22	21.7	43	6.7	103	16.1	163	25.4
44	23	26.0	23	29.9	22	21.9	44	6.9	104	16.2	164	25.6
45	23	26.3	23	30.2	22	22.2	45	7.0	105	16.4	165	25.7
46	23	26.5	23	30.4	22	22.4	46	7.2	106	16.5	166	25.9
47	23	26.8	23	30.7	22	22.7	47	7.3	107	16.7	167	26.0
48	23	27.0	23	30.9	22	22.9	48	7.5	108	16.8	168	26.2
49	23	27.3	23	31.2	22	23.1	49	7.6	109	17.0	169	26.3
50	23	27.5	23	31.4	22	23.4	50	7.8	110	17.1	170	26.5
51	23	27.8	23	31.7	22	23.6	51	7.9	111	17.3	171	26.6
52	23	28.0	23	31.9	22	23.9	52	8.1	112	17.5	172	26.8
53	23	28.3	23	32.2	22	24.1	53	8.3	113	17.6	173	27.0
54	23	28.5	23	32.4	22	24.3	54	8.4	114	17.8	174	27.1
55	23	28.8	23	32.7	22	24.6	55	8.6	115	17.9	175	27.3
56	23	29.0	23	32.9	22	24.8	56	8.7	116	18.1	176	27.4
57	23	29.3	23	33.2	22	25.1	57	8.9	117	18.2	177	27.6
58	23	29.5	23	33.4	22	25.3	58	9.0	118	18.4	178	27.7
59	23	29.8	23	33.7	22	25.5	59	9.2	119	18.5	179	27.9
60	23	30.0	23	33.9	22	25.8	60	9.4	120	18.7	180	28.1

1 h 34 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 30.0	23 33.9	22 25.8	0	.0	60	9.5	120	18.9
1	23 30.3	23 34.2	22 26.0	1	.2	61	9.6	121	19.1
2	23 30.5	23 34.4	22 26.2	2	.3	62	9.8	122	19.2
3	23 30.8	23 34.7	22 26.5	3	.5	63	9.9	123	19.4
4	23 31.0	23 34.9	22 26.7	4	.6	64	10.1	124	19.5
5	23 31.3	23 35.2	22 27.0	5	.8	65	10.2	125	19.7
6	23 31.5	23 35.4	22 27.2	6	.9	66	10.4	126	19.8
7	23 31.8	23 35.7	22 27.4	7	1.1	67	10.6	127	20.0
8	23 32.0	23 35.9	22 27.7	8	1.3	68	10.7	128	20.2
9	23 32.3	23 36.2	22 27.9	9	1.4	69	10.9	129	20.3
10	23 32.5	23 36.4	22 28.2	10	1.6	70	11.0	130	20.5
11	23 32.8	23 36.7	22 28.4	11	1.7	71	11.2	131	20.6
12	23 33.0	23 36.9	22 28.6	12	1.9	72	11.3	132	20.8
13	23 33.3	23 37.2	22 28.9	13	2.0	73	11.5	133	20.9
14	23 33.5	23 37.4	22 29.1	14	2.2	74	11.7	134	21.1
15	23 33.8	23 37.7	22 29.3	15	2.4	75	11.8	135	21.3
16	23 34.0	23 37.9	22 29.6	16	2.5	76	12.0	136	21.4
17	23 34.3	23 38.2	22 29.8	17	2.7	77	12.1	137	21.6
18	23 34.5	23 38.4	22 30.1	18	2.8	78	12.3	138	21.7
19	23 34.8	23 38.7	22 30.3	19	3.0	79	12.4	139	21.9
20	23 35.0	23 38.9	22 30.5	20	3.2	80	12.6	140	22.1
21	23 35.3	23 39.2	22 30.8	21	3.3	81	12.8	141	22.2
22	23 35.5	23 39.4	22 31.0	22	3.5	82	12.9	142	22.4
23	23 35.8	23 39.7	22 31.3	23	3.6	83	13.1	143	22.5
24	23 36.0	23 39.9	22 31.5	24	3.8	84	13.2	144	22.7
25	23 36.3	23 40.2	22 31.7	25	3.9	85	13.4	145	22.8
26	23 36.5	23 40.4	22 32.0	26	4.1	86	13.5	146	23.0
27	23 36.8	23 40.7	22 32.2	27	4.3	87	13.7	147	23.2
28	23 37.0	23 40.9	22 32.4	28	4.4	88	13.9	148	23.3
29	23 37.3	23 41.2	22 32.7	29	4.6	89	14.0	149	23.5
30	23 37.5	23 41.4	22 32.9	30	4.7	90	14.2	150	23.6
31	23 37.8	23 41.7	22 33.2	31	4.9	91	14.3	151	23.8
32	23 38.0	23 41.9	22 33.4	32	5.0	92	14.5	152	23.9
33	23 38.3	23 42.2	22 33.6	33	5.2	93	14.6	153	24.1
34	23 38.5	23 42.4	22 33.9	34	5.4	94	14.8	154	24.3
35	23 38.8	23 42.7	22 34.1	35	5.5	95	15.0	155	24.4
36	23 39.0	23 42.9	22 34.4	36	5.7	96	15.1	156	24.6
37	23 39.3	23 43.2	22 34.6	37	5.8	97	15.3	157	24.7
38	23 39.5	23 43.4	22 34.8	38	6.0	98	15.4	158	24.9
39	23 39.8	23 43.7	22 35.1	39	6.1	99	15.6	159	25.0
40	23 40.0	23 43.9	22 35.3	40	6.3	100	15.8	160	25.2
41	23 40.3	23 44.2	22 35.5	41	6.5	101	15.9	161	25.4
42	23 40.5	23 44.4	22 35.8	42	6.6	102	16.1	162	25.5
43	23 40.8	23 44.7	22 36.0	43	6.8	103	16.2	163	25.7
44	23 41.0	23 44.9	22 36.3	44	6.9	104	16.4	164	25.8
45	23 41.3	23 45.2	22 36.5	45	7.1	105	16.5	165	26.0
46	23 41.5	23 45.4	22 36.7	46	7.2	106	16.7	166	26.1
47	23 41.8	23 45.7	22 37.0	47	7.4	107	16.9	167	26.3
48	23 42.0	23 46.0	22 37.2	48	7.6	108	17.0	168	26.5
49	23 42.3	23 46.2	22 37.5	49	7.7	109	17.2	169	26.6
50	23 42.5	23 46.5	22 37.7	50	7.9	110	17.3	170	26.8
51	23 42.8	23 46.7	22 37.9	51	8.0	111	17.5	171	26.9
52	23 43.0	23 47.0	22 38.2	52	8.2	112	17.6	172	27.1
53	23 43.3	23 47.2	22 38.4	53	8.3	113	17.8	173	27.2
54	23 43.5	23 47.5	22 38.7	54	8.5	114	18.0	174	27.4
55	23 43.8	23 47.7	22 38.9	55	8.7	115	18.1	175	27.6
56	23 44.0	23 48.0	22 39.1	56	8.8	116	18.3	176	27.7
57	23 44.3	23 48.2	22 39.4	57	9.0	117	18.4	177	27.9
58	23 44.5	23 48.5	22 39.6	58	9.1	118	18.6	178	28.0
59	23 44.8	23 48.7	22 39.8	59	9.3	119	18.7	179	28.2
60	23 45.0	23 49.0	22 40.1	60	9.5	120	18.9	180	28.4

1 h 35 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	° ′	° ′	° ′		′		′		′
0	23 45.0	23 49.0	22 40.1	0	.0	60	9.6	120	19.1
1	23 45.3	23 49.2	22 40.3	1	.2	61	9.7	121	19.3
2	23 45.5	23 49.5	22 40.6	2	.3	62	9.9	122	19.4
3	23 45.8	23 49.7	22 40.8	3	.5	63	10.0	123	19.6
4	23 46.0	23 50.0	22 41.0	4	.6	64	10.2	124	19.7
5	23 46.3	23 50.2	22 41.3	5	.8	65	10.3	125	19.9
6	23 46.5	23 50.5	22 41.5	6	1.0	66	10.5	126	20.1
7	23 46.8	23 50.7	22 41.8	7	1.1	67	10.7	127	20.2
8	23 47.0	23 51.0	22 42.0	8	1.3	68	10.8	128	20.4
9	23 47.3	23 51.2	22 42.2	9	1.4	69	11.0	129	20.5
10	23 47.5	23 51.5	22 42.5	10	1.6	70	11.1	130	20.7
11	23 47.8	23 51.7	22 42.7	11	1.8	71	11.3	131	20.9
12	23 48.0	23 52.0	22 42.9	12	1.9	72	11.5	132	21.0
13	23 48.3	23 52.2	22 43.2	13	2.1	73	11.6	133	21.2
14	23 48.5	23 52.5	22 43.4	14	2.2	74	11.8	134	21.3
15	23 48.8	23 52.7	22 43.7	15	2.4	75	11.9	135	21.5
16	23 49.0	23 53.0	22 43.9	16	2.5	76	12.1	136	21.6
17	23 49.3	23 53.2	22 44.1	17	2.7	77	12.3	137	21.8
18	23 49.5	23 53.5	22 44.4	18	2.9	78	12.4	138	22.0
19	23 49.8	23 53.7	22 44.6	19	3.0	79	12.6	139	22.1
20	23 50.0	23 54.0	22 44.9	20	3.2	80	12.7	140	22.3
21	23 50.3	23 54.2	22 45.1	21	3.3	81	12.9	141	22.4
22	23 50.5	23 54.5	22 45.3	22	3.5	82	13.1	142	22.6
23	23 50.8	23 54.7	22 45.6	23	3.7	83	13.2	143	22.8
24	23 51.0	23 55.0	22 45.8	24	3.8	84	13.4	144	22.9
25	23 51.3	23 55.2	22 46.0	25	4.0	85	13.5	145	23.1
26	23 51.5	23 55.5	22 46.3	26	4.1	86	13.7	146	23.2
27	23 51.8	23 55.7	22 46.5	27	4.3	87	13.8	147	23.4
28	23 52.0	23 56.0	22 46.8	28	4.5	88	14.0	148	23.6
29	23 52.3	23 56.2	22 47.0	29	4.6	89	14.2	149	23.7
30	23 52.5	23 56.5	22 47.2	30	4.8	90	14.3	150	23.9
31	23 52.8	23 56.7	22 47.5	31	4.9	91	14.5	151	24.0
32	23 53.0	23 57.0	22 47.7	32	5.1	92	14.6	152	24.2
33	23 53.3	23 57.2	22 48.0	33	5.3	93	14.8	153	24.4
34	23 53.5	23 57.5	22 48.2	34	5.4	94	15.0	154	24.5
35	23 53.8	23 57.7	22 48.4	35	5.6	95	15.1	155	24.7
36	23 54.0	23 58.0	22 48.7	36	5.7	96	15.3	156	24.8
37	23 54.3	23 58.2	22 48.9	37	5.9	97	15.4	157	25.0
38	23 54.5	23 58.5	22 49.2	38	6.0	98	15.6	158	25.1
39	23 54.8	23 58.7	22 49.4	39	6.2	99	15.8	159	25.3
40	23 55.0	23 59.0	22 49.6	40	6.4	100	15.9	160	25.5
41	23 55.3	23 59.2	22 49.9	41	6.5	101	16.1	161	25.6
42	23 55.5	23 59.5	22 50.1	42	6.7	102	16.2	162	25.8
43	23 55.8	23 59.7	22 50.3	43	6.8	103	16.4	163	25.9
44	23 56.0	23 60.0	22 50.6	44	7.0	104	16.6	164	26.1
45	23 56.3	24 .2	22 50.8	45	7.2	105	16.7	165	26.3
46	23 56.5	24 .5	22 51.1	46	7.3	106	16.9	166	26.4
47	23 56.8	24 .7	22 51.3	47	7.5	107	17.0	167	26.6
48	23 57.0	24 1.0	22 51.5	48	7.6	108	17.2	168	26.7
49	23 57.3	24 1.2	22 51.8	49	7.8	109	17.3	169	26.9
50	23 57.5	24 1.5	22 52.0	50	8.0	110	17.5	170	27.1
51	23 57.8	24 1.7	22 52.3	51	8.1	111	17.7	171	27.2
52	23 58.0	24 2.0	22 52.5	52	8.3	112	17.8	172	27.4
53	23 58.3	24 2.2	22 52.7	53	8.4	113	18.0	173	27.5
54	23 58.5	24 2.5	22 53.0	54	8.6	114	18.1	174	27.7
55	23 58.8	24 2.7	22 53.2	55	8.8	115	18.3	175	27.9
56	23 59.0	24 3.0	22 53.4	56	8.9	116	18.5	176	28.0
57	23 59.3	24 3.2	22 53.7	57	9.1	117	18.6	177	28.2
58	23 59.5	24 3.5	22 53.9	58	9.2	118	18.8	178	28.3
59	23 59.8	24 3.7	22 54.2	59	9.4	119	18.9	179	28.5
60	24 .0	24 4.0	22 54.4	60	9.6	120	19.1	180	28.7

1 h 36 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	24	.0	24	4.0	22	54.4	0	.0	60	9.7	120	19.3
1	24	.3	24	4.3	22	54.6	1	.2	61	9.8	121	19.5
2	24	.5	24	4.5	22	54.9	2	.3	62	10.0	122	19.6
3	24	.8	24	4.8	22	55.1	3	.5	63	10.1	123	19.8
4	24	1.0	24	5.0	22	55.4	4	.6	64	10.3	124	19.9
5	24	1.3	24	5.3	22	55.6	5	.8	65	10.5	125	20.1
6	24	1.5	24	5.5	22	55.8	6	1.0	66	10.6	126	20.3
7	24	1.8	24	5.8	22	56.1	7	1.1	67	10.8	127	20.4
8	24	2.0	24	6.0	22	56.3	8	1.3	68	10.9	128	20.6
9	24	2.3	24	6.3	22	56.5	9	1.4	69	11.1	129	20.7
10	24	2.5	24	6.5	22	56.8	10	1.6	70	11.3	130	20.9
11	24	2.8	24	6.8	22	57.0	11	1.8	71	11.4	131	21.1
12	24	3.0	24	7.0	22	57.3	12	1.9	72	11.6	132	21.2
13	24	3.3	24	7.3	22	57.5	13	2.1	73	11.7	133	21.4
14	24	3.5	24	7.5	22	57.7	14	2.3	74	11.9	134	21.6
15	24	3.8	24	7.8	22	58.0	15	2.4	75	12.1	135	21.7
16	24	4.0	24	8.0	22	58.2	16	2.6	76	12.2	136	21.9
17	24	4.3	24	8.3	22	58.5	17	2.7	77	12.4	137	22.0
18	24	4.5	24	8.5	22	58.7	18	2.9	78	12.5	138	22.2
19	24	4.8	24	8.8	22	58.9	19	3.1	79	12.7	139	22.4
20	24	5.0	24	9.0	22	59.2	20	3.2	80	12.9	140	22.5
21	24	5.3	24	9.3	22	59.4	21	3.4	81	13.0	141	22.7
22	24	5.5	24	9.5	22	59.6	22	3.5	82	13.2	142	22.8
23	24	5.8	24	9.8	22	59.9	23	3.7	83	13.3	143	23.0
24	24	6.0	24	10.0	23	.1	24	3.9	84	13.5	144	23.2
25	24	6.3	24	10.3	23	.4	25	4.0	85	13.7	145	23.3
26	24	6.5	24	10.5	23	.6	26	4.2	86	13.8	146	23.5
27	24	6.8	24	10.8	23	.8	27	4.3	87	14.0	147	23.6
28	24	7.0	24	11.0	23	1.1	28	4.5	88	14.2	148	23.8
29	24	7.3	24	11.3	23	1.3	29	4.7	89	14.3	149	24.0
30	24	7.5	24	11.5	23	1.6	30	4.8	90	14.5	150	24.1
31	24	7.8	24	11.8	23	1.8	31	5.0	91	14.6	151	24.3
32	24	8.0	24	12.0	23	2.0	32	5.1	92	14.8	152	24.4
33	24	8.3	24	12.3	23	2.3	33	5.3	93	15.0	153	24.6
34	24	8.5	24	12.5	23	2.5	34	5.5	94	15.1	154	24.8
35	24	8.8	24	12.8	23	2.8	35	5.6	95	15.3	155	24.9
36	24	9.0	24	13.0	23	3.0	36	5.8	96	15.4	156	25.1
37	24	9.3	24	13.3	23	3.2	37	6.0	97	15.6	157	25.3
38	24	9.5	24	13.5	23	3.5	38	6.1	98	15.8	158	25.4
39	24	9.8	24	13.8	23	3.7	39	6.3	99	15.9	159	25.6
40	24	10.0	24	14.0	23	3.9	40	6.4	100	16.1	160	25.7
41	24	10.3	24	14.3	23	4.2	41	6.6	101	16.2	161	25.9
42	24	10.5	24	14.5	23	4.4	42	6.8	102	16.4	162	26.1
43	24	10.8	24	14.8	23	4.7	43	6.9	103	16.6	163	26.2
44	24	11.0	24	15.0	23	4.9	44	7.1	104	16.7	164	26.4
45	24	11.3	24	15.3	23	5.1	45	7.2	105	16.9	165	26.5
46	24	11.5	24	15.5	23	5.4	46	7.4	106	17.0	166	26.7
47	24	11.8	24	15.8	23	5.6	47	7.6	107	17.2	167	26.9
48	24	12.0	24	16.0	23	5.9	48	7.7	108	17.4	168	27.0
49	24	12.3	24	16.3	23	6.1	49	7.9	109	17.5	169	27.2
50	24	12.5	24	16.5	23	6.3	50	8.0	110	17.7	170	27.3
51	24	12.8	24	16.8	23	6.6	51	8.2	111	17.9	171	27.5
52	24	13.0	24	17.0	23	6.8	52	8.4	112	18.0	172	27.7
53	24	13.3	24	17.3	23	7.0	53	8.5	113	18.2	173	27.8
54	24	13.5	24	17.5	23	7.3	54	8.7	114	18.3	174	28.0
55	24	13.8	24	17.8	23	7.5	55	8.8	115	18.5	175	28.1
56	24	14.0	24	18.0	23	7.8	56	9.0	116	18.7	176	28.3
57	24	14.3	24	18.3	23	8.0	57	9.2	117	18.8	177	28.5
58	24	14.5	24	18.5	23	8.2	58	9.3	118	19.0	178	28.6
59	24	14.8	24	18.8	23	8.5	59	9.5	119	19.1	179	28.8
60	24	15.0	24	19.0	23	8.7	60	9.7	120	19.3	180	29.0

1 h 37 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	24	15.0	24	19.0	23	8.7	0	.0	60	9.8	120	19.5
1	24	15.3	24	19.3	23	9.0	1	.2	61	9.9	121	19.7
2	24	15.5	24	19.5	23	9.2	2	.3	62	10.1	122	19.8
3	24	15.8	24	19.8	23	9.4	3	.5	63	10.2	123	20.0
4	24	16.0	24	20.0	23	9.7	4	.7	64	10.4	124	20.2
5	24	16.3	24	20.3	23	9.9	5	.8	65	10.6	125	20.3
6	24	16.5	24	20.5	23	10.1	6	1.0	66	10.7	126	20.5
7	24	16.8	24	20.8	23	10.4	7	1.1	67	10.9	127	20.6
8	24	17.0	24	21.0	23	10.6	8	1.3	68	11.1	128	20.8
9	24	17.3	24	21.3	23	10.9	9	1.5	69	11.2	129	21.0
10	24	17.5	24	21.5	23	11.1	10	1.6	70	11.4	130	21.1
11	24	17.8	24	21.8	23	11.3	11	1.8	71	11.5	131	21.3
12	24	18.0	24	22.1	23	11.6	12	2.0	72	11.7	132	21.5
13	24	18.3	24	22.3	23	11.8	13	2.1	73	11.9	133	21.6
14	24	18.5	24	22.6	23	12.1	14	2.3	74	12.0	134	21.8
15	24	18.8	24	22.8	23	12.3	15	2.4	75	12.2	135	21.9
16	24	19.0	24	23.1	23	12.5	16	2.6	76	12.4	136	22.1
17	24	19.3	24	23.3	23	12.8	17	2.8	77	12.5	137	22.3
18	24	19.5	24	23.6	23	13.0	18	2.9	78	12.7	138	22.4
19	24	19.8	24	23.8	23	13.3	19	3.1	79	12.8	139	22.6
20	24	20.0	24	24.1	23	13.5	20	3.3	80	13.0	140	22.8
21	24	20.3	24	24.3	23	13.7	21	3.4	81	13.2	141	22.9
22	24	20.5	24	24.6	23	14.0	22	3.6	82	13.3	142	23.1
23	24	20.8	24	24.8	23	14.2	23	3.7	83	13.5	143	23.2
24	24	21.0	24	25.1	23	14.4	24	3.9	84	13.7	144	23.4
25	24	21.3	24	25.3	23	14.7	25	4.1	85	13.8	145	23.6
26	24	21.5	24	25.6	23	14.9	26	4.2	86	14.0	146	23.7
27	24	21.8	24	25.8	23	15.2	27	4.4	87	14.1	147	23.9
28	24	22.0	24	26.1	23	15.4	28	4.6	88	14.3	148	24.1
29	24	22.3	24	26.3	23	15.6	29	4.7	89	14.5	149	24.2
30	24	22.5	24	26.6	23	15.9	30	4.9	90	14.6	150	24.4
31	24	22.8	24	26.8	23	16.1	31	5.0	91	14.8	151	24.5
32	24	23.0	24	27.1	23	16.4	32	5.2	92	15.0	152	24.7
33	24	23.3	24	27.3	23	16.6	33	5.4	93	15.1	153	24.9
34	24	23.5	24	27.6	23	16.8	34	5.5	94	15.3	154	25.0
35	24	23.8	24	27.8	23	17.1	35	5.7	95	15.4	155	25.2
36	24	24.0	24	28.1	23	17.3	36	5.9	96	15.6	156	25.4
37	24	24.3	24	28.3	23	17.5	37	6.0	97	15.8	157	25.5
38	24	24.5	24	28.6	23	17.8	38	6.2	98	15.9	158	25.7
39	24	24.8	24	28.8	23	18.0	39	6.3	99	16.1	159	25.8
40	24	25.0	24	29.1	23	18.3	40	6.5	100	16.3	160	26.0
41	24	25.3	24	29.3	23	18.5	41	6.7	101	16.4	161	26.2
42	24	25.5	24	29.6	23	18.7	42	6.8	102	16.6	162	26.3
43	24	25.8	24	29.8	23	19.0	43	7.0	103	16.7	163	26.5
44	24	26.0	24	30.1	23	19.2	44	7.2	104	16.9	164	26.7
45	24	26.3	24	30.3	23	19.5	45	7.3	105	17.1	165	26.8
46	24	26.5	24	30.6	23	19.7	46	7.5	106	17.2	166	27.0
47	24	26.8	24	30.8	23	19.9	47	7.6	107	17.4	167	27.1
48	24	27.0	24	31.1	23	20.2	48	7.8	108	17.6	168	27.3
49	24	27.3	24	31.3	23	20.4	49	8.0	109	17.7	169	27.5
50	24	27.5	24	31.6	23	20.6	50	8.1	110	17.9	170	27.6
51	24	27.8	24	31.8	23	20.9	51	8.3	111	18.0	171	27.8
52	24	28.0	24	32.1	23	21.1	52	8.5	112	18.2	172	28.0
53	24	28.3	24	32.3	23	21.4	53	8.6	113	18.4	173	28.1
54	24	28.5	24	32.6	23	21.6	54	8.8	114	18.5	174	28.3
55	24	28.8	24	32.8	23	21.8	55	8.9	115	18.7	175	28.4
56	24	29.0	24	33.1	23	22.1	56	9.1	116	18.9	176	28.6
57	24	29.3	24	33.3	23	22.3	57	9.3	117	19.0	177	28.8
58	24	29.5	24	33.6	23	22.6	58	9.4	118	19.2	178	28.9
59	24	29.8	24	33.8	23	22.8	59	9.6	119	19.3	179	29.1
60	24	30.0	24	34.1	23	23.0	60	9.8	120	19.5	180	29.3

1 h 38 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	24 30.0	24 34.1	23 23.0	0 .0	60 9.9	120 19.7
1	24 30.3	24 34.3	23 23.3	1 .2	61 10.0	121 19.9
2	24 30.5	24 34.6	23 23.5	2 .3	62 10.2	122 20.0
3	24 30.8	24 34.8	23 23.7	3 .5	63 10.3	123 20.2
4	24 31.0	24 35.1	23 24.0	4 .7	64 10.5	124 20.4
5	24 31.3	24 35.3	23 24.2	5 .8	65 10.7	125 20.5
6	24 31.5	24 35.6	23 24.5	6 1.0	66 10.8	126 20.7
7	24 31.8	24 35.8	23 24.7	7 1.1	67 11.0	127 20.8
8	24 32.0	24 36.1	23 24.9	8 1.3	68 11.2	128 21.0
9	24 32.3	24 36.3	23 25.2	9 1.5	69 11.3	129 21.2
10	24 32.5	24 36.6	23 25.4	10 1.6	70 11.5	130 21.3
11	24 32.8	24 36.8	23 25.7	11 1.8	71 11.7	131 21.5
12	24 33.0	24 37.1	23 25.9	12 2.0	72 11.8	132 21.7
13	24 33.3	24 37.3	23 26.1	13 2.1	73 12.0	133 21.8
14	24 33.5	24 37.6	23 26.4	14 2.3	74 12.1	134 22.0
15	24 33.8	24 37.8	23 26.6	15 2.5	75 12.3	135 22.2
16	24 34.0	24 38.1	23 26.9	16 2.6	76 12.5	136 22.3
17	24 34.3	24 38.3	23 27.1	17 2.8	77 12.6	137 22.5
18	24 34.5	24 38.6	23 27.3	18 3.0	78 12.8	138 22.7
19	24 34.8	24 38.8	23 27.6	19 3.1	79 13.0	139 22.8
20	24 35.0	24 39.1	23 27.8	20 3.3	80 13.1	140 23.0
21	24 35.3	24 39.3	23 28.0	21 3.4	81 13.3	141 23.1
22	24 35.5	24 39.6	23 28.3	22 3.6	82 13.5	142 23.3
23	24 35.8	24 39.8	23 28.5	23 3.8	83 13.6	143 23.5
24	24 36.0	24 40.1	23 28.8	24 3.9	84 13.8	144 23.6
25	24 36.3	24 40.4	23 29.0	25 4.1	85 14.0	145 23.8
26	24 36.5	24 40.6	23 29.2	26 4.3	86 14.1	146 24.0
27	24 36.8	24 40.9	23 29.5	27 4.4	87 14.3	147 24.1
28	24 37.0	24 41.1	23 29.7	28 4.6	88 14.4	148 24.3
29	24 37.3	24 41.4	23 30.0	29 4.8	89 14.6	149 24.5
30	24 37.5	24 41.6	23 30.2	30 4.9	90 14.8	150 24.6
31	24 37.8	24 41.9	23 30.4	31 5.1	91 14.9	151 24.8
32	24 38.0	24 42.1	23 30.7	32 5.3	92 15.1	152 25.0
33	24 38.3	24 42.4	23 30.9	33 5.4	93 15.3	153 25.1
34	24 38.5	24 42.6	23 31.1	34 5.6	94 15.4	154 25.3
35	24 38.8	24 42.9	23 31.4	35 5.7	95 15.6	155 25.4
36	24 39.0	24 43.1	23 31.6	36 5.9	96 15.8	156 25.6
37	24 39.3	24 43.4	23 31.9	37 6.1	97 15.9	157 25.8
38	24 39.5	24 43.6	23 32.1	38 6.2	98 16.1	158 25.9
39	24 39.8	24 43.9	23 32.3	39 6.4	99 16.3	159 26.1
40	24 40.0	24 44.1	23 32.6	40 6.6	100 16.4	160 26.3
41	24 40.3	24 44.4	23 32.8	41 6.7	101 16.6	161 26.4
42	24 40.5	24 44.6	23 33.1	42 6.9	102 16.7	162 26.6
43	24 40.8	24 44.9	23 33.3	43 7.1	103 16.9	163 26.8
44	24 41.0	24 45.1	23 33.5	44 7.2	104 17.1	164 26.9
45	24 41.3	24 45.4	23 33.8	45 7.4	105 17.2	165 27.1
46	24 41.5	24 45.6	23 34.0	46 7.6	106 17.4	166 27.3
47	24 41.8	24 45.9	23 34.2	47 7.7	107 17.6	167 27.4
48	24 42.0	24 46.1	23 34.5	48 7.9	108 17.7	168 27.6
49	24 42.3	24 46.4	23 34.7	49 8.0	109 17.9	169 27.7
50	24 42.5	24 46.6	23 35.0	50 8.2	110 18.1	170 27.9
51	24 42.8	24 46.9	23 35.2	51 8.4	111 18.2	171 28.1
52	24 43.0	24 47.1	23 35.4	52 8.5	112 18.4	172 28.2
53	24 43.3	24 47.4	23 35.7	53 8.7	113 18.6	173 28.4
54	24 43.5	24 47.6	23 35.9	54 8.9	114 18.7	174 28.6
55	24 43.8	24 47.9	23 36.2	55 9.0	115 18.9	175 28.7
56	24 44.0	24 48.1	23 36.4	56 9.2	116 19.0	176 28.9
57	24 44.3	24 48.4	23 36.6	57 9.4	117 19.2	177 29.1
58	24 44.5	24 48.6	23 36.9	58 9.5	118 19.4	178 29.2
59	24 44.8	24 48.9	23 37.1	59 9.7	119 19.5	179 29.4
60	24 45.0	24 49.1	23 37.4	60 9.9	120 19.7	180 29.6

1 h 39 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	24 45.0	24 49.1	23 37.4	0 .0	60 10.0	120 19.9
1	24 45.3	24 49.4	23 37.6	1 .2	61 10.1	121 20.1
2	24 45.5	24 49.6	23 37.8	2 .3	62 10.3	122 20.2
3	24 45.8	24 49.9	23 38.1	3 .5	63 10.4	123 20.4
4	24 46.0	24 50.1	23 38.3	4 .7	64 10.6	124 20.6
5	24 46.3	24 50.4	23 38.5	5 .8	65 10.8	125 20.7
6	24 46.5	24 50.6	23 38.8	6 1.0	66 10.9	126 20.9
7	24 46.8	24 50.9	23 39.0	7 1.2	67 11.1	127 21.1
8	24 47.0	24 51.1	23 39.3	8 1.3	68 11.3	128 21.2
9	24 47.3	24 51.4	23 39.5	9 1.5	69 11.4	129 21.4
10	24 47.5	24 51.6	23 39.7	10 1.7	70 11.6	130 21.6
11	24 47.8	24 51.9	23 40.0	11 1.8	71 11.8	131 21.7
12	24 48.0	24 52.1	23 40.2	12 2.0	72 11.9	132 21.9
13	24 48.3	24 52.4	23 40.5	13 2.2	73 12.1	133 22.1
14	24 48.5	24 52.6	23 40.7	14 2.3	74 12.3	134 22.2
15	24 48.8	24 52.9	23 40.9	15 2.5	75 12.4	135 22.4
16	24 49.0	24 53.1	23 41.2	16 2.7	76 12.6	136 22.6
17	24 49.3	24 53.4	23 41.4	17 2.8	77 12.8	137 22.7
18	24 49.5	24 53.6	23 41.6	18 3.0	78 12.9	138 22.9
19	24 49.8	24 53.9	23 41.9	19 3.2	79 13.1	139 23.1
20	24 50.0	24 54.1	23 42.1	20 3.3	80 13.3	140 23.2
21	24 50.3	24 54.4	23 42.4	21 3.5	81 13.4	141 23.4
22	24 50.5	24 54.6	23 42.6	22 3.6	82 13.6	142 23.5
23	24 50.8	24 54.9	23 42.8	23 3.8	83 13.8	143 23.7
24	24 51.0	24 55.1	23 43.1	24 4.0	84 13.9	144 23.9
25	24 51.3	24 55.4	23 43.3	25 4.1	85 14.1	145 24.0
26	24 51.5	24 55.6	23 43.6	26 4.3	86 14.3	146 24.2
27	24 51.8	24 55.9	23 43.8	27 4.5	87 14.4	147 24.4
28	24 52.0	24 56.1	23 44.0	28 4.6	88 14.6	148 24.5
29	24 52.3	24 56.4	23 44.3	29 4.8	89 14.8	149 24.7
30	24 52.5	24 56.6	23 44.5	30 5.0	90 14.9	150 24.9
31	24 52.8	24 56.9	23 44.7	31 5.1	91 15.1	151 25.0
32	24 53.0	24 57.1	23 45.0	32 5.3	92 15.3	152 25.2
33	24 53.3	24 57.4	23 45.2	33 5.5	93 15.4	153 25.4
34	24 53.5	24 57.6	23 45.5	34 5.6	94 15.6	154 25.5
35	24 53.8	24 57.9	23 45.7	35 5.8	95 15.8	155 25.7
36	24 54.0	24 58.2	23 45.9	36 6.0	96 15.9	156 25.9
37	24 54.3	24 58.4	23 46.2	37 6.1	97 16.1	157 26.0
38	24 54.5	24 58.7	23 46.4	38 6.3	98 16.3	158 26.2
39	24 54.8	24 58.9	23 46.7	39 6.5	99 16.4	159 26.4
40	24 55.0	24 59.2	23 46.9	40 6.6	100 16.6	160 26.5
41	24 55.3	24 59.4	23 47.1	41 6.8	101 16.7	161 26.7
42	24 55.5	24 59.7	23 47.4	42 7.0	102 16.9	162 26.9
43	24 55.8	24 59.9	23 47.6	43 7.1	103 17.1	163 27.0
44	24 56.0	25 .2	23 47.8	44 7.3	104 17.2	164 27.2
45	24 56.3	25 .4	23 48.1	45 7.5	105 17.4	165 27.4
46	24 56.5	25 .7	23 48.3	46 7.6	106 17.6	166 27.5
47	24 56.8	25 .9	23 48.6	47 7.8	107 17.7	167 27.7
48	24 57.0	25 1.2	23 48.8	48 8.0	108 17.9	168 27.9
49	24 57.3	25 1.4	23 49.0	49 8.1	109 18.1	169 28.0
50	24 57.5	25 1.7	23 49.3	50 8.3	110 18.2	170 28.2
51	24 57.8	25 1.9	23 49.5	51 8.5	111 18.4	171 28.4
52	24 58.0	25 2.2	23 49.8	52 8.6	112 18.6	172 28.5
53	24 58.3	25 2.4	23 50.0	53 8.8	113 18.7	173 28.7
54	24 58.5	25 2.7	23 50.2	54 9.0	114 18.9	174 28.9
55	24 58.8	25 2.9	23 50.5	55 9.1	115 19.1	175 29.0
56	24 59.0	25 3.2	23 50.7	56 9.3	116 19.2	176 29.2
57	24 59.3	25 3.4	23 51.0	57 9.5	117 19.4	177 29.4
58	24 59.5	25 3.7	23 51.2	58 9.6	118 19.6	178 29.5
59	24 59.8	25 3.9	23 51.4	59 9.8	119 19.7	179 29.7
60	25 .0	25 4.2	23 51.7	60 10.0	120 19.9	180 29.9

1 h 40 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	25	.0	25	4.2	23	51.7	0	.0	60	10.1	120	20.1
1	25	.3	25	4.4	23	51.9	1	.2	61	10.2	121	20.3
2	25	.5	25	4.7	23	52.1	2	.3	62	10.4	122	20.4
3	25	.8	25	4.9	23	52.4	3	.5	63	10.6	123	20.6
4	25	1.0	25	5.2	23	52.6	4	.7	64	10.7	124	20.8
5	25	1.3	25	5.4	23	52.9	5	.8	65	10.9	125	20.9
6	25	1.5	25	5.7	23	53.1	6	1.0	66	11.1	126	21.1
7	25	1.8	25	5.9	23	53.3	7	1.2	67	11.2	127	21.3
8	25	2.0	25	6.2	23	53.6	8	1.3	68	11.4	128	21.4
9	25	2.3	25	6.4	23	53.8	9	1.5	69	11.6	129	21.6
10	25	2.5	25	6.7	23	54.1	10	1.7	70	11.7	130	21.8
11	25	2.8	25	6.9	23	54.3	11	1.8	71	11.9	131	21.9
12	25	3.0	25	7.2	23	54.5	12	2.0	72	12.1	132	22.1
13	25	3.3	25	7.4	23	54.8	13	2.2	73	12.2	133	22.3
14	25	3.5	25	7.7	23	55.0	14	2.3	74	12.4	134	22.4
15	25	3.8	25	7.9	23	55.2	15	2.5	75	12.6	135	22.6
16	25	4.0	25	8.2	23	55.5	16	2.7	76	12.7	136	22.8
17	25	4.3	25	8.4	23	55.7	17	2.8	77	12.9	137	22.9
18	25	4.5	25	8.7	23	56.0	18	3.0	78	13.1	138	23.1
19	25	4.8	25	8.9	23	56.2	19	3.2	79	13.2	139	23.3
20	25	5.0	25	9.2	23	56.4	20	3.4	80	13.4	140	23.5
21	25	5.3	25	9.4	23	56.7	21	3.5	81	13.6	141	23.6
22	25	5.5	25	9.7	23	56.9	22	3.7	82	13.7	142	23.8
23	25	5.8	25	9.9	23	57.2	23	3.9	83	13.9	143	24.0
24	25	6.0	25	10.2	23	57.4	24	4.0	84	14.1	144	24.1
25	25	6.3	25	10.4	23	57.6	25	4.2	85	14.2	145	24.3
26	25	6.5	25	10.7	23	57.9	26	4.4	86	14.4	146	24.5
27	25	6.8	25	10.9	23	58.1	27	4.5	87	14.6	147	24.6
28	25	7.0	25	11.2	23	58.3	28	4.7	88	14.7	148	24.8
29	25	7.3	25	11.4	23	58.6	29	4.9	89	14.9	149	25.0
30	25	7.5	25	11.7	23	58.8	30	5.0	90	15.1	150	25.1
31	25	7.8	25	11.9	23	59.1	31	5.2	91	15.2	151	25.3
32	25	8.0	25	12.2	23	59.3	32	5.4	92	15.4	152	25.5
33	25	8.3	25	12.4	23	59.5	33	5.5	93	15.6	153	25.6
34	25	8.5	25	12.7	23	59.8	34	5.7	94	15.7	154	25.8
35	25	8.8	25	12.9	24	.0	35	5.9	95	15.9	155	26.0
36	25	9.0	25	13.2	24	.3	36	6.0	96	16.1	156	26.1
37	25	9.3	25	13.4	24	.5	37	6.2	97	16.2	157	26.3
38	25	9.5	25	13.7	24	.7	38	6.4	98	16.4	158	26.5
39	25	9.8	25	13.9	24	1.0	39	6.5	99	16.6	159	26.6
40	25	10.0	25	14.2	24	1.2	40	6.7	100	16.8	160	26.8
41	25	10.3	25	14.4	24	1.4	41	6.9	101	16.9	161	27.0
42	25	10.5	25	14.7	24	1.7	42	7.0	102	17.1	162	27.1
43	25	10.8	25	14.9	24	1.9	43	7.2	103	17.3	163	27.3
44	25	11.0	25	15.2	24	2.2	44	7.4	104	17.4	164	27.5
45	25	11.3	25	15.4	24	2.4	45	7.5	105	17.6	165	27.6
46	25	11.5	25	15.7	24	2.6	46	7.7	106	17.8	166	27.8
47	25	11.8	25	15.9	24	2.9	47	7.9	107	17.9	167	28.0
48	25	12.0	25	16.2	24	3.1	48	8.0	108	18.1	168	28.1
49	25	12.3	25	16.5	24	3.4	49	8.2	109	18.3	169	28.3
50	25	12.5	25	16.7	24	3.6	50	8.4	110	18.4	170	28.5
51	25	12.8	25	17.0	24	3.8	51	8.5	111	18.6	171	28.6
52	25	13.0	25	17.2	24	4.1	52	8.7	112	18.8	172	28.8
53	25	13.3	25	17.5	24	4.3	53	8.9	113	18.9	173	29.0
54	25	13.5	25	17.7	24	4.6	54	9.0	114	19.1	174	29.1
55	25	13.8	25	18.0	24	4.8	55	9.2	115	19.3	175	29.3
56	25	14.0	25	18.2	24	5.0	56	9.4	116	19.4	176	29.5
57	25	14.3	25	18.5	24	5.3	57	9.5	117	19.6	177	29.6
58	25	14.5	25	18.7	24	5.5	58	9.7	118	19.8	178	29.8
59	25	14.8	25	19.0	24	5.7	59	9.9	119	19.9	179	30.0
60	25	15.0	25	19.2	24	6.0	60	10.1	120	20.1	180	30.2

1 h 41 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	25	15.0	25	19.2	24	6.0	0	.0	60	10.2	120	20.3
1	25	15.3	25	19.5	24	6.2	1	.2	61	10.3	121	20.5
2	25	15.5	25	19.7	24	6.5	2	.3	62	10.5	122	20.6
3	25	15.8	25	20.0	24	6.7	3	.5	63	10.7	123	20.8
4	25	16.0	25	20.2	24	6.9	4	.7	64	10.8	124	21.0
5	25	16.3	25	20.5	24	7.2	5	.8	65	11.0	125	21.1
6	25	16.5	25	20.7	24	7.4	6	1.0	66	11.2	126	21.3
7	25	16.8	25	21.0	24	7.7	7	1.2	67	11.3	127	21.5
8	25	17.0	25	21.2	24	7.9	8	1.4	68	11.5	128	21.7
9	25	17.3	25	21.5	24	8.1	9	1.5	69	11.7	129	21.8
10	25	17.5	25	21.7	24	8.4	10	1.7	70	11.8	130	22.0
11	25	17.8	25	22.0	24	8.6	11	1.9	71	12.0	131	22.2
12	25	18.0	25	22.2	24	8.8	12	2.0	72	12.2	132	22.3
13	25	18.3	25	22.5	24	9.1	13	2.2	73	12.3	133	22.5
14	25	18.5	25	22.7	24	9.3	14	2.4	74	12.5	134	22.7
15	25	18.8	25	23.0	24	9.6	15	2.5	75	12.7	135	22.8
16	25	19.0	25	23.2	24	9.8	16	2.7	76	12.9	136	23.0
17	25	19.3	25	23.5	24	10.0	17	2.9	77	13.0	137	23.2
18	25	19.5	25	23.7	24	10.3	18	3.0	78	13.2	138	23.3
19	25	19.8	25	24.0	24	10.5	19	3.2	79	13.4	139	23.5
20	25	20.0	25	24.2	24	10.8	20	3.4	80	13.5	140	23.7
21	25	20.3	25	24.5	24	11.0	21	3.6	81	13.7	141	23.9
22	25	20.5	25	24.7	24	11.2	22	3.7	82	13.9	142	24.0
23	25	20.8	25	25.0	24	11.5	23	3.9	83	14.0	143	24.2
24	25	21.0	25	25.2	24	11.7	24	4.1	84	14.2	144	24.4
25	25	21.3	25	25.5	24	11.9	25	4.2	85	14.4	145	24.5
26	25	21.5	25	25.7	24	12.2	26	4.4	86	14.5	146	24.7
27	25	21.8	25	26.0	24	12.4	27	4.6	87	14.7	147	24.9
28	25	22.0	25	26.2	24	12.7	28	4.7	88	14.9	148	25.0
29	25	22.3	25	26.5	24	12.9	29	4.9	89	15.1	149	25.2
30	25	22.5	25	26.7	24	13.1	30	5.1	90	15.2	150	25.4
31	25	22.8	25	27.0	24	13.4	31	5.2	91	15.4	151	25.5
32	25	23.0	25	27.2	24	13.6	32	5.4	92	15.6	152	25.7
33	25	23.3	25	27.5	24	13.9	33	5.6	93	15.7	153	25.9
34	25	23.5	25	27.7	24	14.1	34	5.8	94	15.9	154	26.1
35	25	23.8	25	28.0	24	14.3	35	5.9	95	16.1	155	26.2
36	25	24.0	25	28.2	24	14.6	36	6.1	96	16.2	156	26.4
37	25	24.3	25	28.5	24	14.8	37	6.3	97	16.4	157	26.6
38	25	24.5	25	28.7	24	15.1	38	6.4	98	16.6	158	26.7
39	25	24.8	25	29.0	24	15.3	39	6.6	99	16.7	159	26.9
40	25	25.0	25	29.2	24	15.5	40	6.8	100	16.9	160	27.1
41	25	25.3	25	29.5	24	15.8	41	6.9	101	17.1	161	27.2
42	25	25.5	25	29.7	24	16.0	42	7.1	102	17.3	162	27.4
43	25	25.8	25	30.0	24	16.2	43	7.3	103	17.4	163	27.6
44	25	26.0	25	30.2	24	16.5	44	7.4	104	17.6	164	27.7
45	25	26.3	25	30.5	24	16.7	45	7.6	105	17.8	165	27.9
46	25	26.5	25	30.7	24	17.0	46	7.8	106	17.9	166	28.1
47	25	26.8	25	31.0	24	17.2	47	8.0	107	18.1	167	28.3
48	25	27.0	25	31.2	24	17.4	48	8.1	108	18.3	168	28.4
49	25	27.3	25	31.5	24	17.7	49	8.3	109	18.4	169	28.6
50	25	27.5	25	31.7	24	17.9	50	8.5	110	18.6	170	28.8
51	25	27.8	25	32.0	24	18.2	51	8.6	111	18.8	171	28.9
52	25	28.0	25	32.2	24	18.4	52	8.8	112	18.9	172	29.1
53	25	28.3	25	32.5	24	18.6	53	9.0	113	19.1	173	29.3
54	25	28.5	25	32.7	24	18.9	54	9.1	114	19.3	174	29.4
55	25	28.8	25	33.0	24	19.1	55	9.3	115	19.5	175	29.6
56	25	29.0	25	33.2	24	19.3	56	9.5	116	19.6	176	29.8
57	25	29.3	25	33.5	24	19.6	57	9.6	117	19.8	177	29.9
58	25	29.5	25	33.7	24	19.8	58	9.8	118	20.0	178	30.1
59	25	29.8	25	34.0	24	20.1	59	10.0	119	20.1	179	30.3
60	25	30.0	25	34.3	24	20.3	60	10.2	120	20.3	180	30.5

1 h 42 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	25 30.0	25 34.3	24 20.3	0 .0	60 10.3	120 20.5
1	25 30.3	25 34.5	24 20.5	1 .2	61 10.4	121 20.7
2	25 30.5	25 34.8	24 20.8	2 .3	62 10.6	122 20.8
3	25 30.8	25 35.0	24 21.0	3 .5	63 10.8	123 21.0
4	25 31.0	25 35.3	24 21.3	4 .7	64 10.9	124 21.2
5	25 31.3	25 35.5	24 21.5	5 .9	65 11.1	125 21.4
6	25 31.5	25 35.8	24 21.7	6 1.0	66 11.3	126 21.5
7	25 31.8	25 36.0	24 22.0	7 1.2	67 11.4	127 21.7
8	25 32.0	25 36.3	24 22.2	8 1.4	68 11.6	128 21.9
9	25 32.3	25 36.5	24 22.4	9 1.5	69 11.8	129 22.0
10	25 32.5	25 36.8	24 22.7	10 1.7	70 12.0	130 22.2
11	25 32.8	25 37.0	24 22.9	11 1.9	71 12.1	131 22.4
12	25 33.0	25 37.3	24 23.2	12 2.1	72 12.3	132 22.6
13	25 33.3	25 37.5	24 23.4	13 2.2	73 12.5	133 22.7
14	25 33.5	25 37.8	24 23.6	14 2.4	74 12.6	134 22.9
15	25 33.8	25 38.0	24 23.9	15 2.6	75 12.8	135 23.1
16	25 34.0	25 38.3	24 24.1	16 2.7	76 13.0	136 23.2
17	25 34.3	25 38.5	24 24.4	17 2.9	77 13.2	137 23.4
18	25 34.5	25 38.8	24 24.6	18 3.1	78 13.3	138 23.6
19	25 34.8	25 39.0	24 24.8	19 3.2	79 13.5	139 23.7
20	25 35.0	25 39.3	24 25.1	20 3.4	80 13.7	140 23.9
21	25 35.3	25 39.5	24 25.3	21 3.6	81 13.8	141 24.1
22	25 35.5	25 39.8	24 25.5	22 3.8	82 14.0	142 24.3
23	25 35.8	25 40.0	24 25.8	23 3.9	83 14.2	143 24.4
24	25 36.0	25 40.3	24 26.0	24 4.1	84 14.4	144 24.6
25	25 36.3	25 40.5	24 26.3	25 4.3	85 14.5	145 24.8
26	25 36.5	25 40.8	24 26.5	26 4.4	86 14.7	146 24.9
27	25 36.8	25 41.0	24 26.7	27 4.6	87 14.9	147 25.1
28	25 37.0	25 41.3	24 27.0	28 4.8	88 15.0	148 25.3
29	25 37.3	25 41.5	24 27.2	29 5.0	89 15.2	149 25.5
30	25 37.5	25 41.8	24 27.5	30 5.1	90 15.4	150 25.6
31	25 37.8	25 42.0	24 27.7	31 5.3	91 15.5	151 25.8
32	25 38.0	25 42.3	24 27.9	32 5.5	92 15.7	152 26.0
33	25 38.3	25 42.5	24 28.2	33 5.6	93 15.9	153 26.1
34	25 38.5	25 42.8	24 28.4	34 5.8	94 16.1	154 26.3
35	25 38.8	25 43.0	24 28.7	35 6.0	95 16.2	155 26.5
36	25 39.0	25 43.3	24 28.9	36 6.2	96 16.4	156 26.7
37	25 39.3	25 43.5	24 29.1	37 6.3	97 16.6	157 26.8
38	25 39.5	25 43.8	24 29.4	38 6.5	98 16.7	158 27.0
39	25 39.8	25 44.0	24 29.6	39 6.7	99 16.9	159 27.2
40	25 40.0	25 44.3	24 29.8	40 6.8	100 17.1	160 27.3
41	25 40.3	25 44.5	24 30.1	41 7.0	101 17.3	161 27.5
42	25 40.5	25 44.8	24 30.3	42 7.2	102 17.4	162 27.7
43	25 40.8	25 45.0	24 30.6	43 7.3	103 17.6	163 27.8
44	25 41.0	25 45.3	24 30.8	44 7.5	104 17.8	164 28.0
45	25 41.3	25 45.5	24 31.0	45 7.7	105 17.9	165 28.2
46	25 41.5	25 45.8	24 31.3	46 7.9	106 18.1	166 28.4
47	25 41.8	25 46.0	24 31.5	47 8.0	107 18.3	167 28.5
48	25 42.0	25 46.3	24 31.8	48 8.2	108 18.5	168 28.7
49	25 42.3	25 46.5	24 32.0	49 8.4	109 18.6	169 28.9
50	25 42.5	25 46.8	24 32.2	50 8.5	110 18.8	170 29.0
51	25 42.8	25 47.0	24 32.5	51 8.7	111 19.0	171 29.2
52	25 43.0	25 47.3	24 32.7	52 8.9	112 19.1	172 29.4
53	25 43.3	25 47.5	24 32.9	53 9.1	113 19.3	173 29.6
54	25 43.5	25 47.8	24 33.2	54 9.2	114 19.5	174 29.7
55	25 43.8	25 48.0	24 33.4	55 9.4	115 19.6	175 29.9
56	25 44.0	25 48.3	24 33.7	56 9.6	116 19.8	176 30.1
57	25 44.3	25 48.5	24 33.9	57 9.7	117 20.0	177 30.2
58	25 44.5	25 48.8	24 34.1	58 9.9	118 20.2	178 30.4
59	25 44.8	25 49.0	24 34.4	59 10.1	119 20.3	179 30.6
60	25 45.0	25 49.3	24 34.6	60 10.3	120 20.5	180 30.8

1 h 43 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	25 45.0	25 49.3	24 34.6	0 .0	60 10.4	120 20.7
1	25 45.3	25 49.5	24 34.9	1 .2	61 10.5	121 20.9
2	25 45.5	25 49.8	24 35.1	2 .3	62 10.7	122 21.0
3	25 45.8	25 50.0	24 35.3	3 .5	63 10.9	123 21.2
4	25 46.0	25 50.3	24 35.6	4 .7	64 11.0	124 21.4
5	25 46.3	25 50.5	24 35.8	5 .9	65 11.2	125 21.6
6	25 46.5	25 50.8	24 36.0	6 1.0	66 11.4	126 21.7
7	25 46.8	25 51.0	24 36.3	7 1.2	67 11.6	127 21.9
8	25 47.0	25 51.3	24 36.5	8 1.4	68 11.7	128 22.1
9	25 47.3	25 51.5	24 36.8	9 1.6	69 11.9	129 22.3
10	25 47.5	25 51.8	24 37.0	10 1.7	70 12.1	130 22.4
11	25 47.8	25 52.0	24 37.2	11 1.9	71 12.2	131 22.6
12	25 48.0	25 52.3	24 37.5	12 2.1	72 12.4	132 22.8
13	25 48.3	25 52.6	24 37.7	13 2.2	73 12.6	133 22.9
14	25 48.5	25 52.8	24 38.0	14 2.4	74 12.8	134 23.1
15	25 48.8	25 53.1	24 38.2	15 2.6	75 12.9	135 23.3
16	25 49.0	25 53.3	24 38.4	16 2.8	76 13.1	136 23.5
17	25 49.3	25 53.6	24 38.7	17 2.9	77 13.3	137 23.6
18	25 49.5	25 53.8	24 38.9	18 3.1	78 13.5	138 23.8
19	25 49.8	25 54.1	24 39.2	19 3.3	79 13.6	139 24.0
20	25 50.0	25 54.3	24 39.4	20 3.5	80 13.8	140 24.2
21	25 50.3	25 54.6	24 39.6	21 3.6	81 14.0	141 24.3
22	25 50.5	25 54.8	24 39.9	22 3.8	82 14.1	142 24.5
23	25 50.8	25 55.1	24 40.1	23 4.0	83 14.3	143 24.7
24	25 51.0	25 55.3	24 40.3	24 4.1	84 14.5	144 24.8
25	25 51.3	25 55.6	24 40.6	25 4.3	85 14.7	145 25.0
26	25 51.5	25 55.8	24 40.8	26 4.5	86 14.8	146 25.2
27	25 51.8	25 56.1	24 41.1	27 4.7	87 15.0	147 25.4
28	25 52.0	25 56.3	24 41.3	28 4.8	88 15.2	148 25.5
29	25 52.3	25 56.6	24 41.5	29 5.0	89 15.4	149 25.7
30	25 52.5	25 56.8	24 41.8	30 5.2	90 15.5	150 25.9
31	25 52.8	25 57.1	24 42.0	31 5.3	91 15.7	151 26.0
32	25 53.0	25 57.3	24 42.3	32 5.5	92 15.9	152 26.2
33	25 53.3	25 57.6	24 42.5	33 5.7	93 16.0	153 26.4
34	25 53.5	25 57.8	24 42.7	34 5.9	94 16.2	154 26.6
35	25 53.8	25 58.1	24 43.0	35 6.0	95 16.4	155 26.7
36	25 54.0	25 58.3	24 43.2	36 6.2	96 16.6	156 26.9
37	25 54.3	25 58.6	24 43.4	37 6.4	97 16.7	157 27.1
38	25 54.5	25 58.8	24 43.7	38 6.6	98 16.9	158 27.3
39	25 54.8	25 59.1	24 43.9	39 6.7	99 17.1	159 27.4
40	25 55.0	25 59.3	24 44.2	40 6.9	100 17.3	160 27.6
41	25 55.3	25 59.6	24 44.4	41 7.1	101 17.4	161 27.8
42	25 55.5	25 59.8	24 44.6	42 7.2	102 17.6	162 27.9
43	25 55.8	26 .1	24 44.9	43 7.4	103 17.8	163 28.1
44	25 56.0	26 .3	24 45.1	44 7.6	104 17.9	164 28.3
45	25 56.3	26 .6	24 45.4	45 7.8	105 18.1	165 28.5
46	25 56.5	26 .8	24 45.6	46 7.9	106 18.3	166 28.6
47	25 56.8	26 1.1	24 45.8	47 8.1	107 18.5	167 28.8
48	25 57.0	26 1.3	24 46.1	48 8.3	108 18.6	168 29.0
49	25 57.3	26 1.6	24 46.3	49 8.5	109 18.8	169 29.2
50	25 57.5	26 1.8	24 46.5	50 8.6	110 19.0	170 29.3
51	25 57.8	26 2.1	24 46.8	51 8.8	111 19.1	171 29.5
52	25 58.0	26 2.3	24 47.0	52 9.0	112 19.3	172 29.7
53	25 58.3	26 2.6	24 47.3	53 9.1	113 19.5	173 29.8
54	25 58.5	26 2.8	24 47.5	54 9.3	114 19.7	174 30.0
55	25 58.8	26 3.1	24 47.7	55 9.5	115 19.8	175 30.2
56	25 59.0	26 3.3	24 48.0	56 9.7	116 20.0	176 30.4
57	25 59.3	26 3.6	24 48.2	57 9.8	117 20.2	177 30.5
58	25 59.5	26 3.8	24 48.5	58 10.0	118 20.4	178 30.7
59	25 59.8	26 4.1	24 48.7	59 10.2	119 20.5	179 30.9
60	26 .0	26 4.3	24 48.9	60 10.4	120 20.7	180 31.1

1 h 44 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	26	.0	26	4.3	24	48.9	0	.0	60	10.5	120	20.9
1	26	.3	26	4.6	24	49.2	1	.2	61	10.6	121	21.1
2	26	.5	26	4.8	24	49.4	2	.3	62	10.8	122	21.2
3	26	.8	26	5.1	24	49.6	3	.5	63	11.0	123	21.4
4	26	1.0	26	5.3	24	49.9	4	.7	64	11.1	124	21.6
5	26	1.3	26	5.6	24	50.1	5	.9	65	11.3	125	21.8
6	26	1.5	26	5.8	24	50.4	6	1.0	66	11.5	126	21.9
7	26	1.8	26	6.1	24	50.6	7	1.2	67	11.7	127	22.1
8	26	2.0	26	6.3	24	50.8	8	1.4	68	11.8	128	22.3
9	26	2.3	26	6.6	24	51.1	9	1.6	69	12.0	129	22.5
10	26	2.5	26	6.8	24	51.3	10	1.7	70	12.2	130	22.6
11	26	2.8	26	7.1	24	51.6	11	1.9	71	12.4	131	22.8
12	26	3.0	26	7.3	24	51.8	12	2.1	72	12.5	132	23.0
13	26	3.3	26	7.6	24	52.0	13	2.3	73	12.7	133	23.2
14	26	3.5	26	7.8	24	52.3	14	2.4	74	12.9	134	23.3
15	26	3.8	26	8.1	24	52.5	15	2.6	75	13.1	135	23.5
16	26	4.0	26	8.3	24	52.8	16	2.8	76	13.2	136	23.7
17	26	4.3	26	8.6	24	53.0	17	3.0	77	13.4	137	23.9
18	26	4.5	26	8.8	24	53.2	18	3.1	78	13.6	138	24.0
19	26	4.8	26	9.1	24	53.5	19	3.3	79	13.8	139	24.2
20	26	5.0	26	9.3	24	53.7	20	3.5	80	13.9	140	24.4
21	26	5.3	26	9.6	24	53.9	21	3.7	81	14.1	141	24.6
22	26	5.5	26	9.8	24	54.2	22	3.8	82	14.3	142	24.7
23	26	5.8	26	10.1	24	54.4	23	4.0	83	14.5	143	24.9
24	26	6.0	26	10.4	24	54.7	24	4.2	84	14.6	144	25.1
25	26	6.3	26	10.6	24	54.9	25	4.4	85	14.8	145	25.3
26	26	6.5	26	10.9	24	55.1	26	4.5	86	15.0	146	25.4
27	26	6.8	26	11.1	24	55.4	27	4.7	87	15.2	147	25.6
28	26	7.0	26	11.4	24	55.6	28	4.9	88	15.3	148	25.8
29	26	7.3	26	11.6	24	55.9	29	5.1	89	15.5	149	26.0
30	26	7.5	26	11.9	24	56.1	30	5.2	90	15.7	150	26.1
31	26	7.8	26	12.1	24	56.3	31	5.4	91	15.8	151	26.3
32	26	8.0	26	12.4	24	56.6	32	5.6	92	16.0	152	26.5
33	26	8.3	26	12.6	24	56.8	33	5.7	93	16.2	153	26.6
34	26	8.5	26	12.9	24	57.0	34	5.9	94	16.4	154	26.8
35	26	8.8	26	13.1	24	57.3	35	6.1	95	16.5	155	27.0
36	26	9.0	26	13.4	24	57.5	36	6.3	96	16.7	156	27.2
37	26	9.3	26	13.6	24	57.8	37	6.4	97	16.9	157	27.3
38	26	9.5	26	13.9	24	58.0	38	6.6	98	17.1	158	27.5
39	26	9.8	26	14.1	24	58.2	39	6.8	99	17.2	159	27.7
40	26	10.0	26	14.4	24	58.5	40	7.0	100	17.4	160	27.9
41	26	10.3	26	14.6	24	58.7	41	7.1	101	17.6	161	28.0
42	26	10.5	26	14.9	24	59.0	42	7.3	102	17.8	162	28.2
43	26	10.8	26	15.1	24	59.2	43	7.5	103	17.9	163	28.4
44	26	11.0	26	15.4	24	59.4	44	7.7	104	18.1	164	28.6
45	26	11.3	26	15.6	24	59.7	45	7.8	105	18.3	165	28.7
46	26	11.5	26	15.9	24	59.9	46	8.0	106	18.5	166	28.9
47	26	11.8	26	16.1	25	.1	47	8.2	107	18.6	167	29.1
48	26	12.0	26	16.4	25	.4	48	8.4	108	18.8	168	29.3
49	26	12.3	26	16.6	25	.6	49	8.5	109	19.0	169	29.4
50	26	12.5	26	16.9	25	.9	50	8.7	110	19.2	170	29.6
51	26	12.8	26	17.1	25	1.1	51	8.9	111	19.3	171	29.8
52	26	13.0	26	17.4	25	1.3	52	9.1	112	19.5	172	30.0
53	26	13.3	26	17.6	25	1.6	53	9.2	113	19.7	173	30.1
54	26	13.5	26	17.9	25	1.8	54	9.4	114	19.9	174	30.3
55	26	13.8	26	18.1	25	2.1	55	9.6	115	20.0	175	30.5
56	26	14.0	26	18.4	25	2.3	56	9.8	116	20.2	176	30.7
57	26	14.3	26	18.6	25	2.5	57	9.9	117	20.4	177	30.8
58	26	14.5	26	18.9	25	2.8	58	10.1	118	20.6	178	31.0
59	26	14.8	26	19.1	25	3.0	59	10.3	119	20.7	179	31.2
60	26	15.0	26	19.4	25	3.3	60	10.5	120	20.9	180	31.4

1 h 45 min

POPRAVKA ČASOVNOG UGLA						POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾	Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	26	15.0	26	19.4	25	3.3	0	.0	60	10.6	120	21.1
1	26	15.3	26	19.6	25	3.5	1	.2	61	10.7	121	21.3
2	26	15.5	26	19.9	25	3.7	2	.4	62	10.9	122	21.5
3	26	15.8	26	20.1	25	4.0	3	.5	63	11.1	123	21.6
4	26	16.0	26	20.4	25	4.2	4	.7	64	11.3	124	21.8
5	26	16.3	26	20.6	25	4.4	5	.9	65	11.4	125	22.0
6	26	16.5	26	20.9	25	4.7	6	1.1	66	11.6	126	22.2
7	26	16.8	26	21.1	25	4.9	7	1.2	67	11.8	127	22.3
8	26	17.0	26	21.4	25	5.2	8	1.4	68	12.0	128	22.5
9	26	17.3	26	21.6	25	5.4	9	1.6	69	12.1	129	22.7
10	26	17.5	26	21.9	25	5.6	10	1.8	70	12.3	130	22.9
11	26	17.8	26	22.1	25	5.9	11	1.9	71	12.5	131	23.0
12	26	18.0	26	22.4	25	6.1	12	2.1	72	12.7	132	23.2
13	26	18.3	26	22.6	25	6.4	13	2.3	73	12.8	133	23.4
14	26	18.5	26	22.9	25	6.6	14	2.5	74	13.0	134	23.6
15	26	18.8	26	23.1	25	6.8	15	2.6	75	13.2	135	23.7
16	26	19.0	26	23.4	25	7.1	16	2.8	76	13.4	136	23.9
17	26	19.3	26	23.6	25	7.3	17	3.0	77	13.5	137	24.1
18	26	19.5	26	23.9	25	7.5	18	3.2	78	13.7	138	24.3
19	26	19.8	26	24.1	25	7.8	19	3.3	79	13.9	139	24.4
20	26	20.0	26	24.4	25	8.0	20	3.5	80	14.1	140	24.6
21	26	20.3	26	24.6	25	8.3	21	3.7	81	14.2	141	24.8
22	26	20.5	26	24.9	25	8.5	22	3.9	82	14.4	142	25.0
23	26	20.8	26	25.1	25	8.7	23	4.0	83	14.6	143	25.1
24	26	21.0	26	25.4	25	9.0	24	4.2	84	14.8	144	25.3
25	26	21.3	26	25.6	25	9.2	25	4.4	85	14.9	145	25.5
26	26	21.5	26	25.9	25	9.5	26	4.6	86	15.1	146	25.7
27	26	21.8	26	26.1	25	9.7	27	4.7	87	15.3	147	25.8
28	26	22.0	26	26.4	25	9.9	28	4.9	88	15.5	148	26.0
29	26	22.3	26	26.6	25	10.2	29	5.1	89	15.6	149	26.2
30	26	22.5	26	26.9	25	10.4	30	5.3	90	15.8	150	26.4
31	26	22.8	26	27.1	25	10.6	31	5.5	91	16.0	151	26.6
32	26	23.0	26	27.4	25	10.9	32	5.6	92	16.2	152	26.7
33	26	23.3	26	27.6	25	11.1	33	5.8	93	16.4	153	26.9
34	26	23.5	26	27.9	25	11.4	34	6.0	94	16.5	154	27.1
35	26	23.8	26	28.1	25	11.6	35	6.2	95	16.7	155	27.3
36	26	24.0	26	28.4	25	11.8	36	6.3	96	16.9	156	27.4
37	26	24.3	26	28.7	25	12.1	37	6.5	97	17.1	157	27.6
38	26	24.5	26	28.9	25	12.3	38	6.7	98	17.2	158	27.8
39	26	24.8	26	29.2	25	12.6	39	6.9	99	17.4	159	28.0
40	26	25.0	26	29.4	25	12.8	40	7.0	100	17.6	160	28.1
41	26	25.3	26	29.7	25	13.0	41	7.2	101	17.8	161	28.3
42	26	25.5	26	29.9	25	13.3	42	7.4	102	17.9	162	28.5
43	26	25.8	26	30.2	25	13.5	43	7.6	103	18.1	163	28.7
44	26	26.0	26	30.4	25	13.7	44	7.7	104	18.3	164	28.8
45	26	26.3	26	30.7	25	14.0	45	7.9	105	18.5	165	29.0
46	26	26.5	26	30.9	25	14.2	46	8.1	106	18.6	166	29.2
47	26	26.8	26	31.2	25	14.5	47	8.3	107	18.8	167	29.4
48	26	27.0	26	31.4	25	14.7	48	8.4	108	19.0	168	29.5
49	26	27.3	26	31.7	25	14.9	49	8.6	109	19.2	169	29.7
50	26	27.5	26	31.9	25	15.2	50	8.8	110	19.3	170	29.9
51	26	27.8	26	32.2	25	15.4	51	9.0	111	19.5	171	30.1
52	26	28.0	26	32.4	25	15.7	52	9.1	112	19.7	172	30.2
53	26	28.3	26	32.7	25	15.9	53	9.3	113	19.9	173	30.4
54	26	28.5	26	32.9	25	16.1	54	9.5	114	20.0	174	30.6
55	26	28.8	26	33.2	25	16.4	55	9.7	115	20.2	175	30.8
56	26	29.0	26	33.4	25	16.6	56	9.8	116	20.4	176	30.9
57	26	29.3	26	33.7	25	16.9	57	10.0	117	20.6	177	31.1
58	26	29.5	26	33.9	25	17.1	58	10.2	118	20.7	178	31.3
59	26	29.8	26	34.2	25	17.3	59	10.4	119	20.9	179	31.5
60	26	30.0	26	34.4	25	17.6	60	10.6	120	21.1	180	31.7

1 h 46 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	26 30.0	26 34.4	25 17.6	0 .0	60 10.7	120 21.3
1	26 30.3	26 34.7	25 17.8	1 .2	61 10.8	121 21.5
2	26 30.5	26 34.9	25 18.0	2 .4	62 11.0	122 21.7
3	26 30.8	26 35.2	25 18.3	3 .5	63 11.2	123 21.8
4	26 31.0	26 35.4	25 18.5	4 .7	64 11.4	124 22.0
5	26 31.3	26 35.7	25 18.8	5 .9	65 11.5	125 22.2
6	26 31.5	26 35.9	25 19.0	6 1.1	66 11.7	126 22.4
7	26 31.8	26 36.2	25 19.2	7 1.2	67 11.9	127 22.5
8	26 32.0	26 36.4	25 19.5	8 1.4	68 12.1	128 22.7
9	26 32.3	26 36.7	25 19.7	9 1.6	69 12.2	129 22.9
10	26 32.5	26 36.9	25 20.0	10 1.8	70 12.4	130 23.1
11	26 32.8	26 37.2	25 20.2	11 2.0	71 12.6	131 23.3
12	26 33.0	26 37.4	25 20.4	12 2.1	72 12.8	132 23.4
13	26 33.3	26 37.7	25 20.7	13 2.3	73 13.0	133 23.6
14	26 33.5	26 37.9	25 20.9	14 2.5	74 13.1	134 23.8
15	26 33.8	26 38.2	25 21.1	15 2.7	75 13.3	135 24.0
16	26 34.0	26 38.4	25 21.4	16 2.8	76 13.5	136 24.1
17	26 34.3	26 38.7	25 21.6	17 3.0	77 13.7	137 24.3
18	26 34.5	26 38.9	25 21.9	18 3.2	78 13.8	138 24.5
19	26 34.8	26 39.2	25 22.1	19 3.4	79 14.0	139 24.7
20	26 35.0	26 39.4	25 22.3	20 3.6	80 14.2	140 24.9
21	26 35.3	26 39.7	25 22.6	21 3.7	81 14.4	141 25.0
22	26 35.5	26 39.9	25 22.8	22 3.9	82 14.6	142 25.2
23	26 35.8	26 40.2	25 23.1	23 4.1	83 14.7	143 25.4
24	26 36.0	26 40.4	25 23.3	24 4.3	84 14.9	144 25.6
25	26 36.3	26 40.7	25 23.5	25 4.4	85 15.1	145 25.7
26	26 36.5	26 40.9	25 23.8	26 4.6	86 15.3	146 25.9
27	26 36.8	26 41.2	25 24.0	27 4.8	87 15.4	147 26.1
28	26 37.0	26 41.4	25 24.2	28 5.0	88 15.6	148 26.3
29	26 37.3	26 41.7	25 24.5	29 5.1	89 15.8	149 26.4
30	26 37.5	26 41.9	25 24.7	30 5.3	90 16.0	150 26.6
31	26 37.8	26 42.2	25 25.0	31 5.5	91 16.2	151 26.8
32	26 38.0	26 42.4	25 25.2	32 5.7	92 16.3	152 27.0
33	26 38.3	26 42.7	25 25.4	33 5.9	93 16.5	153 27.2
34	26 38.5	26 42.9	25 25.7	34 6.0	94 16.7	154 27.3
35	26 38.8	26 43.2	25 25.9	35 6.2	95 16.9	155 27.5
36	26 39.0	26 43.4	25 26.2	36 6.4	96 17.0	156 27.7
37	26 39.3	26 43.7	25 26.4	37 6.6	97 17.2	157 27.9
38	26 39.5	26 43.9	25 26.6	38 6.7	98 17.4	158 28.0
39	26 39.8	26 44.2	25 26.9	39 6.9	99 17.6	159 28.2
40	26 40.0	26 44.4	25 27.1	40 7.1	100 17.8	160 28.4
41	26 40.3	26 44.7	25 27.3	41 7.3	101 17.9	161 28.6
42	26 40.5	26 44.9	25 27.6	42 7.5	102 18.1	162 28.8
43	26 40.8	26 45.2	25 27.8	43 7.6	103 18.3	163 28.9
44	26 41.0	26 45.4	25 28.1	44 7.8	104 18.5	164 29.1
45	26 41.3	26 45.7	25 28.3	45 8.0	105 18.6	165 29.3
46	26 41.5	26 45.9	25 28.5	46 8.2	106 18.8	166 29.5
47	26 41.8	26 46.2	25 28.8	47 8.3	107 19.0	167 29.6
48	26 42.0	26 46.5	25 29.0	48 8.5	108 19.2	168 29.8
49	26 42.3	26 46.7	25 29.3	49 8.7	109 19.3	169 30.0
50	26 42.5	26 47.0	25 29.5	50 8.9	110 19.5	170 30.2
51	26 42.8	26 47.2	25 29.7	51 9.1	111 19.7	171 30.4
52	26 43.0	26 47.5	25 30.0	52 9.2	112 19.9	172 30.5
53	26 43.3	26 47.7	25 30.2	53 9.4	113 20.1	173 30.7
54	26 43.5	26 48.0	25 30.5	54 9.6	114 20.2	174 30.9
55	26 43.8	26 48.2	25 30.7	55 9.8	115 20.4	175 31.1
56	26 44.0	26 48.5	25 30.9	56 9.9	116 20.6	176 31.2
57	26 44.3	26 48.7	25 31.2	57 10.1	117 20.8	177 31.4
58	26 44.5	26 49.0	25 31.4	58 10.3	118 20.9	178 31.6
59	26 44.8	26 49.2	25 31.6	59 10.5	119 21.1	179 31.8
60	26 45.0	26 49.5	25 31.9	60 10.7	120 21.3	180 32.0

1 h 47 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	26 45.0	26 49.5	25 31.9	0 .0	60 10.8	120 21.5
1	26 45.3	26 49.7	25 32.1	1 .2	61 10.9	121 21.7
2	26 45.5	26 50.0	25 32.4	2 .4	62 11.1	122 21.9
3	26 45.8	26 50.2	25 32.6	3 .5	63 11.3	123 22.0
4	26 46.0	26 50.5	25 32.8	4 .7	64 11.5	124 22.2
5	26 46.3	26 50.7	25 33.1	5 .9	65 11.6	125 22.4
6	26 46.5	26 51.0	25 33.3	6 1.1	66 11.8	126 22.6
7	26 46.8	26 51.2	25 33.6	7 1.3	67 12.0	127 22.8
8	26 47.0	26 51.5	25 33.8	8 1.4	68 12.2	128 22.9
9	26 47.3	26 51.7	25 34.0	9 1.6	69 12.4	129 23.1
10	26 47.5	26 52.0	25 34.3	10 1.8	70 12.5	130 23.3
11	26 47.8	26 52.2	25 34.5	11 2.0	71 12.7	131 23.5
12	26 48.0	26 52.5	25 34.7	12 2.2	72 12.9	132 23.7
13	26 48.3	26 52.7	25 35.0	13 2.3	73 13.1	133 23.8
14	26 48.5	26 53.0	25 35.2	14 2.5	74 13.3	134 24.0
15	26 48.8	26 53.2	25 35.5	15 2.7	75 13.4	135 24.2
16	26 49.0	26 53.5	25 35.7	16 2.9	76 13.6	136 24.4
17	26 49.3	26 53.7	25 35.9	17 3.0	77 13.8	137 24.5
18	26 49.5	26 54.0	25 36.2	18 3.2	78 14.0	138 24.7
19	26 49.8	26 54.2	25 36.4	19 3.4	79 14.2	139 24.9
20	26 50.0	26 54.5	25 36.7	20 3.6	80 14.3	140 25.1
21	26 50.3	26 54.7	25 36.9	21 3.8	81 14.5	141 25.3
22	26 50.5	26 55.0	25 37.1	22 3.9	82 14.7	142 25.4
23	26 50.8	26 55.2	25 37.4	23 4.1	83 14.9	143 25.6
24	26 51.0	26 55.5	25 37.6	24 4.3	84 15.1	144 25.8
25	26 51.3	26 55.7	25 37.8	25 4.5	85 15.2	145 26.0
26	26 51.5	26 56.0	25 38.1	26 4.7	86 15.4	146 26.2
27	26 51.8	26 56.2	25 38.3	27 4.8	87 15.6	147 26.3
28	26 52.0	26 56.5	25 38.6	28 5.0	88 15.8	148 26.5
29	26 52.3	26 56.7	25 38.8	29 5.2	89 15.9	149 26.7
30	26 52.5	26 57.0	25 39.0	30 5.4	90 16.1	150 26.9
31	26 52.8	26 57.2	25 39.3	31 5.6	91 16.3	151 27.1
32	26 53.0	26 57.5	25 39.5	32 5.7	92 16.5	152 27.2
33	26 53.3	26 57.7	25 39.8	33 5.9	93 16.7	153 27.4
34	26 53.5	26 58.0	25 40.0	34 6.1	94 16.8	154 27.6
35	26 53.8	26 58.2	25 40.2	35 6.3	95 17.0	155 27.8
36	26 54.0	26 58.5	25 40.5	36 6.5	96 17.2	156 28.0
37	26 54.3	26 58.7	25 40.7	37 6.6	97 17.4	157 28.1
38	26 54.5	26 59.0	25 41.0	38 6.8	98 17.6	158 28.3
39	26 54.8	26 59.2	25 41.2	39 7.0	99 17.7	159 28.5
40	26 55.0	26 59.5	25 41.4	40 7.2	100 17.9	160 28.7
41	26 55.3	26 59.7	25 41.7	41 7.3	101 18.1	161 28.8
42	26 55.5	26 60.0	25 41.9	42 7.5	102 18.3	162 29.0
43	26 55.8	27 .2	25 42.1	43 7.7	103 18.5	163 29.2
44	26 56.0	27 .5	25 42.4	44 7.9	104 18.6	164 29.4
45	26 56.3	27 .7	25 42.6	45 8.1	105 18.8	165 29.6
46	26 56.5	27 1.0	25 42.9	46 8.2	106 19.0	166 29.7
47	26 56.8	27 1.2	25 43.1	47 8.4	107 19.2	167 29.9
48	26 57.0	27 1.5	25 43.3	48 8.6	108 19.4	168 30.1
49	26 57.3	27 1.7	25 43.6	49 8.8	109 19.5	169 30.3
50	26 57.5	27 2.0	25 43.8	50 9.0	110 19.7	170 30.5
51	26 57.8	27 2.2	25 44.1	51 9.1	111 19.9	171 30.6
52	26 58.0	27 2.5	25 44.3	52 9.3	112 20.1	172 30.8
53	26 58.3	27 2.7	25 44.5	53 9.5	113 20.2	173 31.0
54	26 58.5	27 3.0	25 44.8	54 9.7	114 20.4	174 31.2
55	26 58.8	27 3.2	25 45.0	55 9.9	115 20.6	175 31.4
56	26 59.0	27 3.5	25 45.2	56 10.0	116 20.8	176 31.5
57	26 59.3	27 3.7	25 45.5	57 10.2	117 21.0	177 31.7
58	26 59.5	27 4.0	25 45.7	58 10.4	118 21.1	178 31.9
59	26 59.8	27 4.2	25 46.0	59 10.6	119 21.3	179 32.1
60	27 .0	27 4.5	25 46.2	60 10.8	120 21.5	180 32.3

1 h 48 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	27	.0	27	4.5	25	46.2	0	.0	60	10.9	120	21.7
1	27	.3	27	4.8	25	46.4	1	.2	61	11.0	121	21.9
2	27	.5	27	5.0	25	46.7	2	.4	62	11.2	122	22.1
3	27	.8	27	5.3	25	46.9	3	.5	63	11.4	123	22.2
4	27	1.0	27	5.5	25	47.2	4	.7	64	11.6	124	22.4
5	27	1.3	27	5.8	25	47.4	5	.9	65	11.8	125	22.6
6	27	1.5	27	6.0	25	47.6	6	1.1	66	11.9	126	22.8
7	27	1.8	27	6.3	25	47.9	7	1.3	67	12.1	127	23.0
8	27	2.0	27	6.5	25	48.1	8	1.4	68	12.3	128	23.1
9	27	2.3	27	6.8	25	48.3	9	1.6	69	12.5	129	23.3
10	27	2.5	27	7.0	25	48.6	10	1.8	70	12.7	130	23.5
11	27	2.8	27	7.3	25	48.8	11	2.0	71	12.8	131	23.7
12	27	3.0	27	7.5	25	49.1	12	2.2	72	13.0	132	23.9
13	27	3.3	27	7.8	25	49.3	13	2.4	73	13.2	133	24.1
14	27	3.5	27	8.0	25	49.5	14	2.5	74	13.4	134	24.2
15	27	3.8	27	8.3	25	49.8	15	2.7	75	13.6	135	24.4
16	27	4.0	27	8.5	25	50.0	16	2.9	76	13.7	136	24.6
17	27	4.3	27	8.8	25	50.3	17	3.1	77	13.9	137	24.8
18	27	4.5	27	9.0	25	50.5	18	3.3	78	14.1	138	25.0
19	27	4.8	27	9.3	25	50.7	19	3.4	79	14.3	139	25.1
20	27	5.0	27	9.5	25	51.0	20	3.6	80	14.5	140	25.3
21	27	5.3	27	9.8	25	51.2	21	3.8	81	14.6	141	25.5
22	27	5.5	27	10.0	25	51.4	22	4.0	82	14.8	142	25.7
23	27	5.8	27	10.3	25	51.7	23	4.2	83	15.0	143	25.9
24	27	6.0	27	10.5	25	51.9	24	4.3	84	15.2	144	26.0
25	27	6.3	27	10.8	25	52.2	25	4.5	85	15.4	145	26.2
26	27	6.5	27	11.0	25	52.4	26	4.7	86	15.6	146	26.4
27	27	6.8	27	11.3	25	52.6	27	4.9	87	15.7	147	26.6
28	27	7.0	27	11.5	25	52.9	28	5.1	88	15.9	148	26.8
29	27	7.3	27	11.8	25	53.1	29	5.2	89	16.1	149	26.9
30	27	7.5	27	12.0	25	53.4	30	5.4	90	16.3	150	27.1
31	27	7.8	27	12.3	25	53.6	31	5.6	91	16.5	151	27.3
32	27	8.0	27	12.5	25	53.8	32	5.8	92	16.6	152	27.5
33	27	8.3	27	12.8	25	54.1	33	6.0	93	16.8	153	27.7
34	27	8.5	27	13.0	25	54.3	34	6.1	94	17.0	154	27.8
35	27	8.8	27	13.3	25	54.6	35	6.3	95	17.2	155	28.0
36	27	9.0	27	13.5	25	54.8	36	6.5	96	17.4	156	28.2
37	27	9.3	27	13.8	25	55.0	37	6.7	97	17.5	157	28.4
38	27	9.5	27	14.0	25	55.3	38	6.9	98	17.7	158	28.6
39	27	9.8	27	14.3	25	55.5	39	7.1	99	17.9	159	28.8
40	27	10.0	27	14.5	25	55.7	40	7.2	100	18.1	160	28.9
41	27	10.3	27	14.8	25	56.0	41	7.4	101	18.3	161	29.1
42	27	10.5	27	15.0	25	56.2	42	7.6	102	18.4	162	29.3
43	27	10.8	27	15.3	25	56.5	43	7.8	103	18.6	163	29.5
44	27	11.0	27	15.5	25	56.7	44	8.0	104	18.8	164	29.7
45	27	11.3	27	15.8	25	56.9	45	8.1	105	19.0	165	29.8
46	27	11.5	27	16.0	25	57.2	46	8.3	106	19.2	166	30.0
47	27	11.8	27	16.3	25	57.4	47	8.5	107	19.3	167	30.2
48	27	12.0	27	16.5	25	57.7	48	8.7	108	19.5	168	30.4
49	27	12.3	27	16.8	25	57.9	49	8.9	109	19.7	169	30.6
50	27	12.5	27	17.0	25	58.1	50	9.0	110	19.9	170	30.7
51	27	12.8	27	17.3	25	58.4	51	9.2	111	20.1	171	30.9
52	27	13.0	27	17.5	25	58.6	52	9.4	112	20.3	172	31.1
53	27	13.3	27	17.8	25	58.8	53	9.6	113	20.4	173	31.3
54	27	13.5	27	18.0	25	59.1	54	9.8	114	20.6	174	31.5
55	27	13.8	27	18.3	25	59.3	55	9.9	115	20.8	175	31.6
56	27	14.0	27	18.5	25	59.6	56	10.1	116	21.0	176	31.8
57	27	14.3	27	18.8	25	59.8	57	10.3	117	21.2	177	32.0
58	27	14.5	27	19.0	26	.0	58	10.5	118	21.3	178	32.2
59	27	14.8	27	19.3	26	.3	59	10.7	119	21.5	179	32.4
60	27	15.0	27	19.5	26	.5	60	10.9	120	21.7	180	32.6

1 h 49 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	27	15.0	27	19.5	26	.5	0	.0	60	11.0	120	21.9
1	27	15.3	27	19.8	26	.8	1	.2	61	11.1	121	22.1
2	27	15.5	27	20.0	26	1.0	2	.4	62	11.3	122	22.3
3	27	15.8	27	20.3	26	1.2	3	.5	63	11.5	123	22.4
4	27	16.0	27	20.5	26	1.5	4	.7	64	11.7	124	22.6
5	27	16.3	27	20.8	26	1.7	5	.9	65	11.9	125	22.8
6	27	16.5	27	21.0	26	1.9	6	1.1	66	12.0	126	23.0
7	27	16.8	27	21.3	26	2.2	7	1.3	67	12.2	127	23.2
8	27	17.0	27	21.5	26	2.4	8	1.5	68	12.4	128	23.4
9	27	17.3	27	21.8	26	2.7	9	1.6	69	12.6	129	23.5
10	27	17.5	27	22.0	26	2.9	10	1.8	70	12.8	130	23.7
11	27	17.8	27	22.3	26	3.1	11	2.0	71	13.0	131	23.9
12	27	18.0	27	22.6	26	3.4	12	2.2	72	13.1	132	24.1
13	27	18.3	27	22.8	26	3.6	13	2.4	73	13.3	133	24.3
14	27	18.5	27	23.1	26	3.9	14	2.6	74	13.5	134	24.5
15	27	18.8	27	23.3	26	4.1	15	2.7	75	13.7	135	24.6
16	27	19.0	27	23.6	26	4.3	16	2.9	76	13.9	136	24.8
17	27	19.3	27	23.8	26	4.6	17	3.1	77	14.1	137	25.0
18	27	19.5	27	24.1	26	4.8	18	3.3	78	14.2	138	25.2
19	27	19.8	27	24.3	26	5.1	19	3.5	79	14.4	139	25.4
20	27	20.0	27	24.6	26	5.3	20	3.7	80	14.6	140	25.6
21	27	20.3	27	24.8	26	5.5	21	3.8	81	14.8	141	25.7
22	27	20.5	27	25.1	26	5.8	22	4.0	82	15.0	142	25.9
23	27	20.8	27	25.3	26	6.0	23	4.2	83	15.1	143	26.1
24	27	21.0	27	25.6	26	6.2	24	4.4	84	15.3	144	26.3
25	27	21.3	27	25.8	26	6.5	25	4.6	85	15.5	145	26.5
26	27	21.5	27	26.1	26	6.7	26	4.7	86	15.7	146	26.6
27	27	21.8	27	26.3	26	7.0	27	4.9	87	15.9	147	26.8
28	27	22.0	27	26.6	26	7.2	28	5.1	88	16.1	148	27.0
29	27	22.3	27	26.8	26	7.4	29	5.3	89	16.2	149	27.2
30	27	22.5	27	27.1	26	7.7	30	5.5	90	16.4	150	27.4
31	27	22.8	27	27.3	26	7.9	31	5.7	91	16.6	151	27.6
32	27	23.0	27	27.6	26	8.2	32	5.8	92	16.8	152	27.7
33	27	23.3	27	27.8	26	8.4	33	6.0	93	17.0	153	27.9
34	27	23.5	27	28.1	26	8.6	34	6.2	94	17.2	154	28.1
35	27	23.8	27	28.3	26	8.9	35	6.4	95	17.3	155	28.3
36	27	24.0	27	28.6	26	9.1	36	6.6	96	17.5	156	28.5
37	27	24.3	27	28.8	26	9.3	37	6.8	97	17.7	157	28.7
38	27	24.5	27	29.1	26	9.6	38	6.9	98	17.9	158	28.8
39	27	24.8	27	29.3	26	9.8	39	7.1	99	18.1	159	29.0
40	27	25.0	27	29.6	26	10.1	40	7.3	100	18.3	160	29.2
41	27	25.3	27	29.8	26	10.3	41	7.5	101	18.4	161	29.4
42	27	25.5	27	30.1	26	10.5	42	7.7	102	18.6	162	29.6
43	27	25.8	27	30.3	26	10.8	43	7.8	103	18.8	163	29.7
44	27	26.0	27	30.6	26	11.0	44	8.0	104	19.0	164	29.9
45	27	26.3	27	30.8	26	11.3	45	8.2	105	19.2	165	30.1
46	27	26.5	27	31.1	26	11.5	46	8.4	106	19.3	166	30.3
47	27	26.8	27	31.3	26	11.7	47	8.6	107	19.5	167	30.5
48	27	27.0	27	31.6	26	12.0	48	8.8	108	19.7	168	30.7
49	27	27.3	27	31.8	26	12.2	49	8.9	109	19.9	169	30.8
50	27	27.5	27	32.1	26	12.4	50	9.1	110	20.1	170	31.0
51	27	27.8	27	32.3	26	12.7	51	9.3	111	20.3	171	31.2
52	27	28.0	27	32.6	26	12.9	52	9.5	112	20.4	172	31.4
53	27	28.3	27	32.8	26	13.2	53	9.7	113	20.6	173	31.6
54	27	28.5	27	33.1	26	13.4	54	9.9	114	20.8	174	31.8
55	27	28.8	27	33.3	26	13.6	55	10.0	115	21.0	175	31.9
56	27	29.0	27	33.6	26	13.9	56	10.2	116	21.2	176	32.1
57	27	29.3	27	33.8	26	14.1	57	10.4	117	21.4	177	32.3
58	27	29.5	27	34.1	26	14.4	58	10.6	118	21.5	178	32.5
59	27	29.8	27	34.3	26	14.6	59	10.8	119	21.7	179	32.7
60	27	30.0	27	34.6	26	14.8	60	11.0	120	21.9	180	32.9

1 h 50 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	27 30.0	27 34.6	26 14.8	0 .0	60 11.1	120 22.1
1	27 30.3	27 34.8	26 15.1	1 .2	61 11.2	121 22.3
2	27 30.5	27 35.1	26 15.3	2 .4	62 11.4	122 22.5
3	27 30.8	27 35.3	26 15.5	3 .6	63 11.6	123 22.7
4	27 31.0	27 35.6	26 15.8	4 .7	64 11.8	124 22.8
5	27 31.3	27 35.8	26 16.0	5 .9	65 12.0	125 23.0
6	27 31.5	27 36.1	26 16.3	6 1.1	66 12.2	126 23.2
7	27 31.8	27 36.3	26 16.5	7 1.3	67 12.3	127 23.4
8	27 32.0	27 36.6	26 16.7	8 1.5	68 12.5	128 23.6
9	27 32.3	27 36.8	26 17.0	9 1.7	69 12.7	129 23.8
10	27 32.5	27 37.1	26 17.2	10 1.8	70 12.9	130 23.9
11	27 32.8	27 37.3	26 17.5	11 2.0	71 13.1	131 24.1
12	27 33.0	27 37.6	26 17.7	12 2.2	72 13.3	132 24.3
13	27 33.3	27 37.8	26 17.9	13 2.4	73 13.4	133 24.5
14	27 33.5	27 38.1	26 18.2	14 2.6	74 13.6	134 24.7
15	27 33.8	27 38.3	26 18.4	15 2.8	75 13.8	135 24.9
16	27 34.0	27 38.6	26 18.7	16 2.9	76 14.0	136 25.0
17	27 34.3	27 38.8	26 18.9	17 3.1	77 14.2	137 25.2
18	27 34.5	27 39.1	26 19.1	18 3.3	78 14.4	138 25.4
19	27 34.8	27 39.3	26 19.4	19 3.5	79 14.5	139 25.6
20	27 35.0	27 39.6	26 19.6	20 3.7	80 14.7	140 25.8
21	27 35.3	27 39.8	26 19.8	21 3.9	81 14.9	141 26.0
22	27 35.5	27 40.1	26 20.1	22 4.1	82 15.1	142 26.2
23	27 35.8	27 40.3	26 20.3	23 4.2	83 15.3	143 26.3
24	27 36.0	27 40.6	26 20.6	24 4.4	84 15.5	144 26.5
25	27 36.3	27 40.9	26 20.8	25 4.6	85 15.7	145 26.7
26	27 36.5	27 41.1	26 21.0	26 4.8	86 15.8	146 26.9
27	27 36.8	27 41.4	26 21.3	27 5.0	87 16.0	147 27.1
28	27 37.0	27 41.6	26 21.5	28 5.2	88 16.2	148 27.3
29	27 37.3	27 41.9	26 21.8	29 5.3	89 16.4	149 27.4
30	27 37.5	27 42.1	26 22.0	30 5.5	90 16.6	150 27.6
31	27 37.8	27 42.4	26 22.2	31 5.7	91 16.8	151 27.8
32	27 38.0	27 42.6	26 22.5	32 5.9	92 16.9	152 28.0
33	27 38.3	27 42.9	26 22.7	33 6.1	93 17.1	153 28.2
34	27 38.5	27 43.1	26 22.9	34 6.3	94 17.3	154 28.4
35	27 38.8	27 43.4	26 23.2	35 6.4	95 17.5	155 28.5
36	27 39.0	27 43.6	26 23.4	36 6.6	96 17.7	156 28.7
37	27 39.3	27 43.9	26 23.7	37 6.8	97 17.9	157 28.9
38	27 39.5	27 44.1	26 23.9	38 7.0	98 18.0	158 29.1
39	27 39.8	27 44.4	26 24.1	39 7.2	99 18.2	159 29.3
40	27 40.0	27 44.6	26 24.4	40 7.4	100 18.4	160 29.5
41	27 40.3	27 44.9	26 24.6	41 7.6	101 18.6	161 29.7
42	27 40.5	27 45.1	26 24.9	42 7.7	102 18.8	162 29.8
43	27 40.8	27 45.4	26 25.1	43 7.9	103 19.0	163 30.0
44	27 41.0	27 45.6	26 25.3	44 8.1	104 19.2	164 30.2
45	27 41.3	27 45.9	26 25.6	45 8.3	105 19.3	165 30.4
46	27 41.5	27 46.1	26 25.8	46 8.5	106 19.5	166 30.6
47	27 41.8	27 46.4	26 26.0	47 8.7	107 19.7	167 30.8
48	27 42.0	27 46.6	26 26.3	48 8.8	108 19.9	168 30.9
49	27 42.3	27 46.9	26 26.5	49 9.0	109 20.1	169 31.1
50	27 42.5	27 47.1	26 26.8	50 9.2	110 20.3	170 31.3
51	27 42.8	27 47.4	26 27.0	51 9.4	111 20.4	171 31.5
52	27 43.0	27 47.6	26 27.2	52 9.6	112 20.6	172 31.7
53	27 43.3	27 47.9	26 27.5	53 9.8	113 20.8	173 31.9
54	27 43.5	27 48.1	26 27.7	54 9.9	114 21.0	174 32.0
55	27 43.8	27 48.4	26 28.0	55 10.1	115 21.2	175 32.2
56	27 44.0	27 48.6	26 28.2	56 10.3	116 21.4	176 32.4
57	27 44.3	27 48.9	26 28.4	57 10.5	117 21.5	177 32.6
58	27 44.5	27 49.1	26 28.7	58 10.7	118 21.7	178 32.8
59	27 44.8	27 49.4	26 28.9	59 10.9	119 21.9	179 33.0
60	27 45.0	27 49.6	26 29.2	60 11.1	120 22.1	180 33.2

1 h 51 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	27 45.0	27 49.6	26 29.2	0 .0	60 11.2	120 22.3
1	27 45.3	27 49.9	26 29.4	1 .2	61 11.3	121 22.5
2	27 45.5	27 50.1	26 29.6	2 .4	62 11.5	122 22.7
3	27 45.8	27 50.4	26 29.9	3 .6	63 11.7	123 22.9
4	27 46.0	27 50.6	26 30.1	4 .7	64 11.9	124 23.0
5	27 46.3	27 50.9	26 30.3	5 .9	65 12.1	125 23.2
6	27 46.5	27 51.1	26 30.6	6 1.1	66 12.3	126 23.4
7	27 46.8	27 51.4	26 30.8	7 1.3	67 12.5	127 23.6
8	27 47.0	27 51.6	26 31.1	8 1.5	68 12.6	128 23.8
9	27 47.3	27 51.9	26 31.3	9 1.7	69 12.8	129 24.0
10	27 47.5	27 52.1	26 31.5	10 1.9	70 13.0	130 24.2
11	27 47.8	27 52.4	26 31.8	11 2.0	71 13.2	131 24.3
12	27 48.0	27 52.6	26 32.0	12 2.2	72 13.4	132 24.5
13	27 48.3	27 52.9	26 32.3	13 2.4	73 13.6	133 24.7
14	27 48.5	27 53.1	26 32.5	14 2.6	74 13.8	134 24.9
15	27 48.8	27 53.4	26 32.7	15 2.8	75 13.9	135 25.1
16	27 49.0	27 53.6	26 33.0	16 3.0	76 14.1	136 25.3
17	27 49.3	27 53.9	26 33.2	17 3.2	77 14.3	137 25.5
18	27 49.5	27 54.1	26 33.4	18 3.3	78 14.5	138 25.6
19	27 49.8	27 54.4	26 33.7	19 3.5	79 14.7	139 25.8
20	27 50.0	27 54.6	26 33.9	20 3.7	80 14.9	140 26.0
21	27 50.3	27 54.9	26 34.2	21 3.9	81 15.1	141 26.2
22	27 50.5	27 55.1	26 34.4	22 4.1	82 15.2	142 26.4
23	27 50.8	27 55.4	26 34.6	23 4.3	83 15.4	143 26.6
24	27 51.0	27 55.6	26 34.9	24 4.5	84 15.6	144 26.8
25	27 51.3	27 55.9	26 35.1	25 4.6	85 15.8	145 26.9
26	27 51.5	27 56.1	26 35.4	26 4.8	86 16.0	146 27.1
27	27 51.8	27 56.4	26 35.6	27 5.0	87 16.2	147 27.3
28	27 52.0	27 56.6	26 35.8	28 5.2	88 16.4	148 27.5
29	27 52.3	27 56.9	26 36.1	29 5.4	89 16.5	149 27.7
30	27 52.5	27 57.1	26 36.3	30 5.6	90 16.7	150 27.9
31	27 52.8	27 57.4	26 36.5	31 5.8	91 16.9	151 28.1
32	27 53.0	27 57.6	26 36.8	32 5.9	92 17.1	152 28.2
33	27 53.3	27 57.9	26 37.0	33 6.1	93 17.3	153 28.4
34	27 53.5	27 58.1	26 37.3	34 6.3	94 17.5	154 28.6
35	27 53.8	27 58.4	26 37.5	35 6.5	95 17.7	155 28.8
36	27 54.0	27 58.7	26 37.7	36 6.7	96 17.8	156 29.0
37	27 54.3	27 58.9	26 38.0	37 6.9	97 18.0	157 29.2
38	27 54.5	27 59.2	26 38.2	38 7.1	98 18.2	158 29.4
39	27 54.8	27 59.4	26 38.5	39 7.2	99 18.4	159 29.5
40	27 55.0	27 59.7	26 38.7	40 7.4	100 18.6	160 29.7
41	27 55.3	27 59.9	26 38.9	41 7.6	101 18.8	161 29.9
42	27 55.5	28 .2	26 39.2	42 7.8	102 19.0	162 30.1
43	27 55.8	28 .4	26 39.4	43 8.0	103 19.1	163 30.3
44	27 56.0	28 .7	26 39.6	44 8.2	104 19.3	164 30.5
45	27 56.3	28 .9	26 39.9	45 8.4	105 19.5	165 30.7
46	27 56.5	28 1.2	26 40.1	46 8.5	106 19.7	166 30.8
47	27 56.8	28 1.4	26 40.4	47 8.7	107 19.9	167 31.0
48	27 57.0	28 1.7	26 40.6	48 8.9	108 20.1	168 31.2
49	27 57.3	28 1.9	26 40.8	49 9.1	109 20.3	169 31.4
50	27 57.5	28 2.2	26 41.1	50 9.3	110 20.4	170 31.6
51	27 57.8	28 2.4	26 41.3	51 9.5	111 20.6	171 31.8
52	27 58.0	28 2.7	26 41.6	52 9.7	112 20.8	172 32.0
53	27 58.3	28 2.9	26 41.8	53 9.8	113 21.0	173 32.1
54	27 58.5	28 3.2	26 42.0	54 10.0	114 21.2	174 32.3
55	27 58.8	28 3.4	26 42.3	55 10.2	115 21.4	175 32.5
56	27 59.0	28 3.7	26 42.5	56 10.4	116 21.6	176 32.7
57	27 59.3	28 3.9	26 42.8	57 10.6	117 21.7	177 32.9
58	27 59.5	28 4.2	26 43.0	58 10.8	118 21.9	178 33.1
59	27 59.8	28 4.4	26 43.2	59 11.0	119 22.1	179 33.3
60	28 .0	28 4.7	26 43.5	60 11.2	120 22.3	180 33.5

1 h 52 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	28	.0	28	4.7	26	43.5	0	.0	60	11.3	120	22.5
1	28	.3	28	4.9	26	43.7	1	.2	61	11.4	121	22.7
2	28	.5	28	5.2	26	43.9	2	.4	62	11.6	122	22.9
3	28	.8	28	5.4	26	44.2	3	.6	63	11.8	123	23.1
4	28	1.0	28	5.7	26	44.4	4	.8	64	12.0	124	23.3
5	28	1.3	28	5.9	26	44.7	5	.9	65	12.2	125	23.4
6	28	1.5	28	6.2	26	44.9	6	1.1	66	12.4	126	23.6
7	28	1.8	28	6.4	26	45.1	7	1.3	67	12.6	127	23.8
8	28	2.0	28	6.7	26	45.4	8	1.5	68	12.8	128	24.0
9	28	2.3	28	6.9	26	45.6	9	1.7	69	12.9	129	24.2
10	28	2.5	28	7.2	26	45.9	10	1.9	70	13.1	130	24.4
11	28	2.8	28	7.4	26	46.1	11	2.1	71	13.3	131	24.6
12	28	3.0	28	7.7	26	46.3	12	2.3	72	13.5	132	24.8
13	28	3.3	28	7.9	26	46.6	13	2.4	73	13.7	133	24.9
14	28	3.5	28	8.2	26	46.8	14	2.6	74	13.9	134	25.1
15	28	3.8	28	8.4	26	47.0	15	2.8	75	14.1	135	25.3
16	28	4.0	28	8.7	26	47.3	16	3.0	76	14.3	136	25.5
17	28	4.3	28	8.9	26	47.5	17	3.2	77	14.4	137	25.7
18	28	4.5	28	9.2	26	47.8	18	3.4	78	14.6	138	25.9
19	28	4.8	28	9.4	26	48.0	19	3.6	79	14.8	139	26.1
20	28	5.0	28	9.7	26	48.2	20	3.8	80	15.0	140	26.3
21	28	5.3	28	9.9	26	48.5	21	3.9	81	15.2	141	26.4
22	28	5.5	28	10.2	26	48.7	22	4.1	82	15.4	142	26.6
23	28	5.8	28	10.4	26	49.0	23	4.3	83	15.6	143	26.8
24	28	6.0	28	10.7	26	49.2	24	4.5	84	15.8	144	27.0
25	28	6.3	28	10.9	26	49.4	25	4.7	85	15.9	145	27.2
26	28	6.5	28	11.2	26	49.7	26	4.9	86	16.1	146	27.4
27	28	6.8	28	11.4	26	49.9	27	5.1	87	16.3	147	27.6
28	28	7.0	28	11.7	26	50.1	28	5.3	88	16.5	148	27.8
29	28	7.3	28	11.9	26	50.4	29	5.4	89	16.7	149	27.9
30	28	7.5	28	12.2	26	50.6	30	5.6	90	16.9	150	28.1
31	28	7.8	28	12.4	26	50.9	31	5.8	91	17.1	151	28.3
32	28	8.0	28	12.7	26	51.1	32	6.0	92	17.3	152	28.5
33	28	8.3	28	12.9	26	51.3	33	6.2	93	17.4	153	28.7
34	28	8.5	28	13.2	26	51.6	34	6.4	94	17.6	154	28.9
35	28	8.8	28	13.4	26	51.8	35	6.6	95	17.8	155	29.1
36	28	9.0	28	13.7	26	52.1	36	6.8	96	18.0	156	29.3
37	28	9.3	28	13.9	26	52.3	37	6.9	97	18.2	157	29.4
38	28	9.5	28	14.2	26	52.5	38	7.1	98	18.4	158	29.6
39	28	9.8	28	14.4	26	52.8	39	7.3	99	18.6	159	29.8
40	28	10.0	28	14.7	26	53.0	40	7.5	100	18.8	160	30.0
41	28	10.3	28	14.9	26	53.2	41	7.7	101	18.9	161	30.2
42	28	10.5	28	15.2	26	53.5	42	7.9	102	19.1	162	30.4
43	28	10.8	28	15.4	26	53.7	43	8.1	103	19.3	163	30.6
44	28	11.0	28	15.7	26	54.0	44	8.3	104	19.5	164	30.8
45	28	11.3	28	15.9	26	54.2	45	8.4	105	19.7	165	30.9
46	28	11.5	28	16.2	26	54.4	46	8.6	106	19.9	166	31.1
47	28	11.8	28	16.4	26	54.7	47	8.8	107	20.1	167	31.3
48	28	12.0	28	16.7	26	54.9	48	9.0	108	20.3	168	31.5
49	28	12.3	28	17.0	26	55.2	49	9.2	109	20.4	169	31.7
50	28	12.5	28	17.2	26	55.4	50	9.4	110	20.6	170	31.9
51	28	12.8	28	17.5	26	55.6	51	9.6	111	20.8	171	32.1
52	28	13.0	28	17.7	26	55.9	52	9.8	112	21.0	172	32.3
53	28	13.3	28	18.0	26	56.1	53	9.9	113	21.2	173	32.4
54	28	13.5	28	18.2	26	56.4	54	10.1	114	21.4	174	32.6
55	28	13.8	28	18.5	26	56.6	55	10.3	115	21.6	175	32.8
56	28	14.0	28	18.7	26	56.8	56	10.5	116	21.8	176	33.0
57	28	14.3	28	19.0	26	57.1	57	10.7	117	21.9	177	33.2
58	28	14.5	28	19.2	26	57.3	58	10.9	118	22.1	178	33.4
59	28	14.8	28	19.5	26	57.5	59	11.1	119	22.3	179	33.6
60	28	15.0	28	19.7	26	57.8	60	11.3	120	22.5	180	33.8

1 h 53 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	28	15.0	28	19.7	26	57.8	0	.0	60	11.4	120	22.7
1	28	15.3	28	20.0	26	58.0	1	.2	61	11.5	121	22.9
2	28	15.5	28	20.2	26	58.3	2	.4	62	11.7	122	23.1
3	28	15.8	28	20.5	26	58.5	3	.6	63	11.9	123	23.3
4	28	16.0	28	20.7	26	58.7	4	.8	64	12.1	124	23.5
5	28	16.3	28	21.0	26	59.0	5	.9	65	12.3	125	23.6
6	28	16.5	28	21.2	26	59.2	6	1.1	66	12.5	126	23.8
7	28	16.8	28	21.5	26	59.5	7	1.3	67	12.7	127	24.0
8	28	17.0	28	21.7	26	59.7	8	1.5	68	12.9	128	24.2
9	28	17.3	28	22.0	26	59.9	9	1.7	69	13.1	129	24.4
10	28	17.5	28	22.2	27	.2	10	1.9	70	13.2	130	24.6
11	28	17.8	28	22.5	27	.4	11	2.1	71	13.4	131	24.8
12	28	18.0	28	22.7	27	.6	12	2.3	72	13.6	132	25.0
13	28	18.3	28	23.0	27	.9	13	2.5	73	13.8	133	25.2
14	28	18.5	28	23.2	27	1.1	14	2.6	74	14.0	134	25.3
15	28	18.8	28	23.5	27	1.4	15	2.8	75	14.2	135	25.5
16	28	19.0	28	23.7	27	1.6	16	3.0	76	14.4	136	25.7
17	28	19.3	28	24.0	27	1.8	17	3.2	77	14.6	137	25.9
18	28	19.5	28	24.2	27	2.1	18	3.4	78	14.8	138	26.1
19	28	19.8	28	24.5	27	2.3	19	3.6	79	14.9	139	26.3
20	28	20.0	28	24.7	27	2.6	20	3.8	80	15.1	140	26.5
21	28	20.3	28	25.0	27	2.8	21	4.0	81	15.3	141	26.7
22	28	20.5	28	25.2	27	3.0	22	4.2	82	15.5	142	26.9
23	28	20.8	28	25.5	27	3.3	23	4.4	83	15.7	143	27.1
24	28	21.0	28	25.7	27	3.5	24	4.5	84	15.9	144	27.2
25	28	21.3	28	26.0	27	3.7	25	4.7	85	16.1	145	27.4
26	28	21.5	28	26.2	27	4.0	26	4.9	86	16.3	146	27.6
27	28	21.8	28	26.5	27	4.2	27	5.1	87	16.5	147	27.8
28	28	22.0	28	26.7	27	4.5	28	5.3	88	16.6	148	28.0
29	28	22.3	28	27.0	27	4.7	29	5.5	89	16.8	149	28.2
30	28	22.5	28	27.2	27	4.9	30	5.7	90	17.0	150	28.4
31	28	22.8	28	27.5	27	5.2	31	5.9	91	17.2	151	28.6
32	28	23.0	28	27.7	27	5.4	32	6.1	92	17.4	152	28.8
33	28	23.3	28	28.0	27	5.7	33	6.2	93	17.6	153	28.9
34	28	23.5	28	28.2	27	5.9	34	6.4	94	17.8	154	29.1
35	28	23.8	28	28.5	27	6.1	35	6.6	95	18.0	155	29.3
36	28	24.0	28	28.7	27	6.4	36	6.8	96	18.2	156	29.5
37	28	24.3	28	29.0	27	6.6	37	7.0	97	18.3	157	29.7
38	28	24.5	28	29.2	27	6.9	38	7.2	98	18.5	158	29.9
39	28	24.8	28	29.5	27	7.1	39	7.4	99	18.7	159	30.1
40	28	25.0	28	29.7	27	7.3	40	7.6	100	18.9	160	30.3
41	28	25.3	28	30.0	27	7.6	41	7.8	101	19.1	161	30.5
42	28	25.5	28	30.2	27	7.8	42	7.9	102	19.3	162	30.6
43	28	25.8	28	30.5	27	8.0	43	8.1	103	19.5	163	30.8
44	28	26.0	28	30.7	27	8.3	44	8.3	104	19.7	164	31.0
45	28	26.3	28	31.0	27	8.5	45	8.5	105	19.9	165	31.2
46	28	26.5	28	31.2	27	8.8	46	8.7	106	20.1	166	31.4
47	28	26.8	28	31.5	27	9.0	47	8.9	107	20.2	167	31.6
48	28	27.0	28	31.7	27	9.2	48	9.1	108	20.4	168	31.8
49	28	27.3	28	32.0	27	9.5	49	9.3	109	20.6	169	32.0
50	28	27.5	28	32.2	27	9.7	50	9.5	110	20.8	170	32.2
51	28	27.8	28	32.5	27	10.0	51	9.6	111	21.0	171	32.3
52	28	28.0	28	32.7	27	10.2	52	9.8	112	21.2	172	32.5
53	28	28.3	28	33.0	27	10.4	53	10.0	113	21.4	173	32.7
54	28	28.5	28	33.2	27	10.7	54	10.2	114	21.6	174	32.9
55	28	28.8	28	33.5	27	10.9	55	10.4	115	21.8	175	33.1
56	28	29.0	28	33.7	27	11.1	56	10.6	116	21.9	176	33.3
57	28	29.3	28	34.0	27	11.4	57	10.8	117	22.1	177	33.5
58	28	29.5	28	34.2	27	11.6	58	11.0	118	22.3	178	33.7
59	28	29.8	28	34.5	27	11.9	59	11.2	119	22.5	179	33.9
60	28	30.0	28	34.8	27	12.1	60	11.4	120	22.7	180	34.1

1 h 54 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	28 30.0	28 34.8	27 12.1	0 .0	60 11.5	120 22.9
1	28 30.3	28 35.0	27 12.3	1 .2	61 11.6	121 23.1
2	28 30.5	28 35.3	27 12.6	2 .4	62 11.8	122 23.3
3	28 30.8	28 35.5	27 12.8	3 .6	63 12.0	123 23.5
4	28 31.0	28 35.8	27 13.1	4 .8	64 12.2	124 23.7
5	28 31.3	28 36.0	27 13.3	5 1.0	65 12.4	125 23.9
6	28 31.5	28 36.3	27 13.5	6 1.1	66 12.6	126 24.0
7	28 31.8	28 36.5	27 13.8	7 1.3	67 12.8	127 24.2
8	28 32.0	28 36.8	27 14.0	8 1.5	68 13.0	128 24.4
9	28 32.3	28 37.0	27 14.2	9 1.7	69 13.2	129 24.6
10	28 32.5	28 37.3	27 14.5	10 1.9	70 13.4	130 24.8
11	28 32.8	28 37.5	27 14.7	11 2.1	71 13.5	131 25.0
12	28 33.0	28 37.8	27 15.0	12 2.3	72 13.7	132 25.2
13	28 33.3	28 38.0	27 15.2	13 2.5	73 13.9	133 25.4
14	28 33.5	28 38.3	27 15.4	14 2.7	74 14.1	134 25.6
15	28 33.8	28 38.5	27 15.7	15 2.9	75 14.3	135 25.8
16	28 34.0	28 38.8	27 15.9	16 3.1	76 14.5	136 26.0
17	28 34.3	28 39.0	27 16.2	17 3.2	77 14.7	137 26.1
18	28 34.5	28 39.3	27 16.4	18 3.4	78 14.9	138 26.3
19	28 34.8	28 39.5	27 16.6	19 3.6	79 15.1	139 26.5
20	28 35.0	28 39.8	27 16.9	20 3.8	80 15.3	140 26.7
21	28 35.3	28 40.0	27 17.1	21 4.0	81 15.5	141 26.9
22	28 35.5	28 40.3	27 17.3	22 4.2	82 15.6	142 27.1
23	28 35.8	28 40.5	27 17.6	23 4.4	83 15.8	143 27.3
24	28 36.0	28 40.8	27 17.8	24 4.6	84 16.0	144 27.5
25	28 36.3	28 41.0	27 18.1	25 4.8	85 16.2	145 27.7
26	28 36.5	28 41.3	27 18.3	26 5.0	86 16.4	146 27.9
27	28 36.8	28 41.5	27 18.5	27 5.2	87 16.6	147 28.1
28	28 37.0	28 41.8	27 18.8	28 5.3	88 16.8	148 28.2
29	28 37.3	28 42.0	27 19.0	29 5.5	89 17.0	149 28.4
30	28 37.5	28 42.3	27 19.3	30 5.7	90 17.2	150 28.6
31	28 37.8	28 42.5	27 19.5	31 5.9	91 17.4	151 28.8
32	28 38.0	28 42.8	27 19.7	32 6.1	92 17.6	152 29.0
33	28 38.3	28 43.0	27 20.0	33 6.3	93 17.7	153 29.2
34	28 38.5	28 43.3	27 20.2	34 6.5	94 17.9	154 29.4
35	28 38.8	28 43.5	27 20.5	35 6.7	95 18.1	155 29.6
36	28 39.0	28 43.8	27 20.7	36 6.9	96 18.3	156 29.8
37	28 39.3	28 44.0	27 20.9	37 7.1	97 18.5	157 30.0
38	28 39.5	28 44.3	27 21.2	38 7.3	98 18.7	158 30.2
39	28 39.8	28 44.5	27 21.4	39 7.4	99 18.9	159 30.3
40	28 40.0	28 44.8	27 21.6	40 7.6	100 19.1	160 30.5
41	28 40.3	28 45.0	27 21.9	41 7.8	101 19.3	161 30.7
42	28 40.5	28 45.3	27 22.1	42 8.0	102 19.5	162 30.9
43	28 40.8	28 45.5	27 22.4	43 8.2	103 19.7	163 31.1
44	28 41.0	28 45.8	27 22.6	44 8.4	104 19.8	164 31.3
45	28 41.3	28 46.0	27 22.8	45 8.6	105 20.0	165 31.5
46	28 41.5	28 46.3	27 23.1	46 8.8	106 20.2	166 31.7
47	28 41.8	28 46.5	27 23.3	47 9.0	107 20.4	167 31.9
48	28 42.0	28 46.8	27 23.6	48 9.2	108 20.6	168 32.1
49	28 42.3	28 47.0	27 23.8	49 9.4	109 20.8	169 32.3
50	28 42.5	28 47.3	27 24.0	50 9.5	110 21.0	170 32.4
51	28 42.8	28 47.5	27 24.3	51 9.7	111 21.2	171 32.6
52	28 43.0	28 47.8	27 24.5	52 9.9	112 21.4	172 32.8
53	28 43.3	28 48.0	27 24.7	53 10.1	113 21.6	173 33.0
54	28 43.5	28 48.3	27 25.0	54 10.3	114 21.8	174 33.2
55	28 43.8	28 48.5	27 25.2	55 10.5	115 21.9	175 33.4
56	28 44.0	28 48.8	27 25.5	56 10.7	116 22.1	176 33.6
57	28 44.3	28 49.0	27 25.7	57 10.9	117 22.3	177 33.8
58	28 44.5	28 49.3	27 25.9	58 11.1	118 22.5	178 34.0
59	28 44.8	28 49.5	27 26.2	59 11.3	119 22.7	179 34.2
60	28 45.0	28 49.8	27 26.4	60 11.5	120 22.9	180 34.4

1 h 55 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	28 45.0	28 49.8	27 26.4	0 .0	60 11.6	120 23.1
1	28 45.3	28 50.0	27 26.7	1 .2	61 11.7	121 23.3
2	28 45.5	28 50.3	27 26.9	2 .4	62 11.9	122 23.5
3	28 45.8	28 50.5	27 27.1	3 .6	63 12.1	123 23.7
4	28 46.0	28 50.8	27 27.4	4 .8	64 12.3	124 23.9
5	28 46.3	28 51.0	27 27.6	5 1.0	65 12.5	125 24.1
6	28 46.5	28 51.3	27 27.8	6 1.2	66 12.7	126 24.3
7	28 46.8	28 51.5	27 28.1	7 1.3	67 12.9	127 24.4
8	28 47.0	28 51.8	27 28.3	8 1.5	68 13.1	128 24.6
9	28 47.3	28 52.0	27 28.6	9 1.7	69 13.3	129 24.8
10	28 47.5	28 52.3	27 28.8	10 1.9	70 13.5	130 25.0
11	28 47.8	28 52.5	27 29.0	11 2.1	71 13.7	131 25.2
12	28 48.0	28 52.8	27 29.3	12 2.3	72 13.9	132 25.4
13	28 48.3	28 53.1	27 29.5	13 2.5	73 14.1	133 25.6
14	28 48.5	28 53.3	27 29.8	14 2.7	74 14.2	134 25.8
15	28 48.8	28 53.6	27 30.0	15 2.9	75 14.4	135 26.0
16	28 49.0	28 53.8	27 30.2	16 3.1	76 14.6	136 26.2
17	28 49.3	28 54.1	27 30.5	17 3.3	77 14.8	137 26.4
18	28 49.5	28 54.3	27 30.7	18 3.5	78 15.0	138 26.6
19	28 49.8	28 54.6	27 31.0	19 3.7	79 15.2	139 26.8
20	28 50.0	28 54.8	27 31.2	20 3.9	80 15.4	140 27.0
21	28 50.3	28 55.1	27 31.4	21 4.0	81 15.6	141 27.1
22	28 50.5	28 55.3	27 31.7	22 4.2	82 15.8	142 27.3
23	28 50.8	28 55.6	27 31.9	23 4.4	83 16.0	143 27.5
24	28 51.0	28 55.8	27 32.1	24 4.6	84 16.2	144 27.7
25	28 51.3	28 56.1	27 32.4	25 4.8	85 16.4	145 27.9
26	28 51.5	28 56.3	27 32.6	26 5.0	86 16.6	146 28.1
27	28 51.8	28 56.6	27 32.9	27 5.2	87 16.7	147 28.3
28	28 52.0	28 56.8	27 33.1	28 5.4	88 16.9	148 28.5
29	28 52.3	28 57.1	27 33.3	29 5.6	89 17.1	149 28.7
30	28 52.5	28 57.3	27 33.6	30 5.8	90 17.3	150 28.9
31	28 52.8	28 57.6	27 33.8	31 6.0	91 17.5	151 29.1
32	28 53.0	28 57.8	27 34.1	32 6.2	92 17.7	152 29.3
33	28 53.3	28 58.1	27 34.3	33 6.4	93 17.9	153 29.5
34	28 53.5	28 58.3	27 34.5	34 6.5	94 18.1	154 29.6
35	28 53.8	28 58.6	27 34.8	35 6.7	95 18.3	155 29.8
36	28 54.0	28 58.8	27 35.0	36 6.9	96 18.5	156 30.0
37	28 54.3	28 59.1	27 35.2	37 7.1	97 18.7	157 30.2
38	28 54.5	28 59.3	27 35.5	38 7.3	98 18.9	158 30.4
39	28 54.8	28 59.6	27 35.7	39 7.5	99 19.1	159 30.6
40	28 55.0	28 59.8	27 36.0	40 7.7	100 19.3	160 30.8
41	28 55.3	29 .1	27 36.2	41 7.9	101 19.4	161 31.0
42	28 55.5	29 .3	27 36.4	42 8.1	102 19.6	162 31.2
43	28 55.8	29 .6	27 36.7	43 8.3	103 19.8	163 31.4
44	28 56.0	29 .8	27 36.9	44 8.5	104 20.0	164 31.6
45	28 56.3	29 1.1	27 37.2	45 8.7	105 20.2	165 31.8
46	28 56.5	29 1.3	27 37.4	46 8.9	106 20.4	166 32.0
47	28 56.8	29 1.6	27 37.6	47 9.0	107 20.6	167 32.1
48	28 57.0	29 1.8	27 37.9	48 9.2	108 20.8	168 32.3
49	28 57.3	29 2.1	27 38.1	49 9.4	109 21.0	169 32.5
50	28 57.5	29 2.3	27 38.3	50 9.6	110 21.2	170 32.7
51	28 57.8	29 2.6	27 38.6	51 9.8	111 21.4	171 32.9
52	28 58.0	29 2.8	27 38.8	52 10.0	112 21.6	172 33.1
53	28 58.3	29 3.1	27 39.1	53 10.2	113 21.8	173 33.3
54	28 58.5	29 3.3	27 39.3	54 10.4	114 21.9	174 33.5
55	28 58.8	29 3.6	27 39.5	55 10.6	115 22.1	175 33.7
56	28 59.0	29 3.8	27 39.8	56 10.8	116 22.3	176 33.9
57	28 59.3	29 4.1	27 40.0	57 11.0	117 22.5	177 34.1
58	28 59.5	29 4.3	27 40.3	58 11.2	118 22.7	178 34.3
59	28 59.8	29 4.6	27 40.5	59 11.4	119 22.9	179 34.5
60	29 .0	29 4.8	27 40.7	60 11.6	120 23.1	180 34.7

1 h 56 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	29	.0	29	4.8	27	40.7	0	.0	60	11.7	120	23.3
1	29	.3	29	5.1	27	41.0	1	.2	61	11.8	121	23.5
2	29	.5	29	5.3	27	41.2	2	.4	62	12.0	122	23.7
3	29	.8	29	5.6	27	41.4	3	.6	63	12.2	123	23.9
4	29	1.0	29	5.8	27	41.7	4	.8	64	12.4	124	24.1
5	29	1.3	29	6.1	27	41.9	5	1.0	65	12.6	125	24.3
6	29	1.5	29	6.3	27	42.2	6	1.2	66	12.8	126	24.5
7	29	1.8	29	6.6	27	42.4	7	1.4	67	13.0	127	24.7
8	29	2.0	29	6.8	27	42.6	8	1.6	68	13.2	128	24.9
9	29	2.3	29	7.1	27	42.9	9	1.7	69	13.4	129	25.0
10	29	2.5	29	7.3	27	43.1	10	1.9	70	13.6	130	25.2
11	29	2.8	29	7.6	27	43.4	11	2.1	71	13.8	131	25.4
12	29	3.0	29	7.8	27	43.6	12	2.3	72	14.0	132	25.6
13	29	3.3	29	8.1	27	43.8	13	2.5	73	14.2	133	25.8
14	29	3.5	29	8.3	27	44.1	14	2.7	74	14.4	134	26.0
15	29	3.8	29	8.6	27	44.3	15	2.9	75	14.6	135	26.2
16	29	4.0	29	8.8	27	44.6	16	3.1	76	14.8	136	26.4
17	29	4.3	29	9.1	27	44.8	17	3.3	77	15.0	137	26.6
18	29	4.5	29	9.3	27	45.0	18	3.5	78	15.1	138	26.8
19	29	4.8	29	9.6	27	45.3	19	3.7	79	15.3	139	27.0
20	29	5.0	29	9.8	27	45.5	20	3.9	80	15.5	140	27.2
21	29	5.3	29	10.1	27	45.7	21	4.1	81	15.7	141	27.4
22	29	5.5	29	10.3	27	46.0	22	4.3	82	15.9	142	27.6
23	29	5.8	29	10.6	27	46.2	23	4.5	83	16.1	143	27.8
24	29	6.0	29	10.9	27	46.5	24	4.7	84	16.3	144	28.0
25	29	6.3	29	11.1	27	46.7	25	4.9	85	16.5	145	28.2
26	29	6.5	29	11.4	27	46.9	26	5.0	86	16.7	146	28.3
27	29	6.8	29	11.6	27	47.2	27	5.2	87	16.9	147	28.5
28	29	7.0	29	11.9	27	47.4	28	5.4	88	17.1	148	28.7
29	29	7.3	29	12.1	27	47.7	29	5.6	89	17.3	149	28.9
30	29	7.5	29	12.4	27	47.9	30	5.8	90	17.5	150	29.1
31	29	7.8	29	12.6	27	48.1	31	6.0	91	17.7	151	29.3
32	29	8.0	29	12.9	27	48.4	32	6.2	92	17.9	152	29.5
33	29	8.3	29	13.1	27	48.6	33	6.4	93	18.1	153	29.7
34	29	8.5	29	13.4	27	48.8	34	6.6	94	18.3	154	29.9
35	29	8.8	29	13.6	27	49.1	35	6.8	95	18.4	155	30.1
36	29	9.0	29	13.9	27	49.3	36	7.0	96	18.6	156	30.3
37	29	9.3	29	14.1	27	49.6	37	7.2	97	18.8	157	30.5
38	29	9.5	29	14.4	27	49.8	38	7.4	98	19.0	158	30.7
39	29	9.8	29	14.6	27	50.0	39	7.6	99	19.2	159	30.9
40	29	10.0	29	14.9	27	50.3	40	7.8	100	19.4	160	31.1
41	29	10.3	29	15.1	27	50.5	41	8.0	101	19.6	161	31.3
42	29	10.5	29	15.4	27	50.8	42	8.2	102	19.8	162	31.5
43	29	10.8	29	15.6	27	51.0	43	8.3	103	20.0	163	31.6
44	29	11.0	29	15.9	27	51.2	44	8.5	104	20.2	164	31.8
45	29	11.3	29	16.1	27	51.5	45	8.7	105	20.4	165	32.0
46	29	11.5	29	16.4	27	51.7	46	8.9	106	20.6	166	32.2
47	29	11.8	29	16.6	27	51.9	47	9.1	107	20.8	167	32.4
48	29	12.0	29	16.9	27	52.2	48	9.3	108	21.0	168	32.6
49	29	12.3	29	17.1	27	52.4	49	9.5	109	21.2	169	32.8
50	29	12.5	29	17.4	27	52.7	50	9.7	110	21.4	170	33.0
51	29	12.8	29	17.6	27	52.9	51	9.9	111	21.6	171	33.2
52	29	13.0	29	17.9	27	53.1	52	10.1	112	21.7	172	33.4
53	29	13.3	29	18.1	27	53.4	53	10.3	113	21.9	173	33.6
54	29	13.5	29	18.4	27	53.6	54	10.5	114	22.1	174	33.8
55	29	13.8	29	18.6	27	53.9	55	10.7	115	22.3	175	34.0
56	29	14.0	29	18.9	27	54.1	56	10.9	116	22.5	176	34.2
57	29	14.3	29	19.1	27	54.3	57	11.1	117	22.7	177	34.4
58	29	14.5	29	19.4	27	54.6	58	11.3	118	22.9	178	34.6
59	29	14.8	29	19.6	27	54.8	59	11.5	119	23.1	179	34.8
60	29	15.0	29	19.9	27	55.1	60	11.7	120	23.3	180	35.0

1 h 57 min

POPRAVKA ČASOVNOG UGLA					POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta					
s	SUNCA I PLANETA		PROLEĆNE TAČKE ♈		MESECA ☾		Δ	popr.	Δ	popr.	Δ	popr.
	°	′	°	′	°	′		′		′		′
0	29	15.0	29	19.9	27	55.1	0	.0	60	11.8	120	23.5
1	29	15.3	29	20.1	27	55.3	1	.2	61	11.9	121	23.7
2	29	15.5	29	20.4	27	55.5	2	.4	62	12.1	122	23.9
3	29	15.8	29	20.6	27	55.8	3	.6	63	12.3	123	24.1
4	29	16.0	29	20.9	27	56.0	4	.8	64	12.5	124	24.3
5	29	16.3	29	21.1	27	56.2	5	1.0	65	12.7	125	24.5
6	29	16.5	29	21.4	27	56.5	6	1.2	66	12.9	126	24.7
7	29	16.8	29	21.6	27	56.7	7	1.4	67	13.1	127	24.9
8	29	17.0	29	21.9	27	57.0	8	1.6	68	13.3	128	25.1
9	29	17.3	29	22.1	27	57.2	9	1.8	69	13.5	129	25.3
10	29	17.5	29	22.4	27	57.4	10	2.0	70	13.7	130	25.5
11	29	17.8	29	22.6	27	57.7	11	2.2	71	13.9	131	25.7
12	29	18.0	29	22.9	27	57.9	12	2.4	72	14.1	132	25.9
13	29	18.3	29	23.1	27	58.2	13	2.5	73	14.3	133	26.0
14	29	18.5	29	23.4	27	58.4	14	2.7	74	14.5	134	26.2
15	29	18.8	29	23.6	27	58.6	15	2.9	75	14.7	135	26.4
16	29	19.0	29	23.9	27	58.9	16	3.1	76	14.9	136	26.6
17	29	19.3	29	24.1	27	59.1	17	3.3	77	15.1	137	26.8
18	29	19.5	29	24.4	27	59.3	18	3.5	78	15.3	138	27.0
19	29	19.8	29	24.6	27	59.6	19	3.7	79	15.5	139	27.2
20	29	20.0	29	24.9	27	59.8	20	3.9	80	15.7	140	27.4
21	29	20.3	29	25.1	28	.1	21	4.1	81	15.9	141	27.6
22	29	20.5	29	25.4	28	.3	22	4.3	82	16.1	142	27.8
23	29	20.8	29	25.6	28	.5	23	4.5	83	16.3	143	28.0
24	29	21.0	29	25.9	28	.8	24	4.7	84	16.5	144	28.2
25	29	21.3	29	26.1	28	1.0	25	4.9	85	16.6	145	28.4
26	29	21.5	29	26.4	28	1.3	26	5.1	86	16.8	146	28.6
27	29	21.8	29	26.6	28	1.5	27	5.3	87	17.0	147	28.8
28	29	22.0	29	26.9	28	1.7	28	5.5	88	17.2	148	29.0
29	29	22.3	29	27.1	28	2.0	29	5.7	89	17.4	149	29.2
30	29	22.5	29	27.4	28	2.2	30	5.9	90	17.6	150	29.4
31	29	22.8	29	27.6	28	2.4	31	6.1	91	17.8	151	29.6
32	29	23.0	29	27.9	28	2.7	32	6.3	92	18.0	152	29.8
33	29	23.3	29	28.1	28	2.9	33	6.5	93	18.2	153	30.0
34	29	23.5	29	28.4	28	3.2	34	6.7	94	18.4	154	30.2
35	29	23.8	29	28.6	28	3.4	35	6.9	95	18.6	155	30.4
36	29	24.0	29	28.9	28	3.6	36	7.1	96	18.8	156	30.6
37	29	24.3	29	29.2	28	3.9	37	7.2	97	19.0	157	30.7
38	29	24.5	29	29.4	28	4.1	38	7.4	98	19.2	158	30.9
39	29	24.8	29	29.7	28	4.4	39	7.6	99	19.4	159	31.1
40	29	25.0	29	29.9	28	4.6	40	7.8	100	19.6	160	31.3
41	29	25.3	29	30.2	28	4.8	41	8.0	101	19.8	161	31.5
42	29	25.5	29	30.4	28	5.1	42	8.2	102	20.0	162	31.7
43	29	25.8	29	30.7	28	5.3	43	8.4	103	20.2	163	31.9
44	29	26.0	29	30.9	28	5.5	44	8.6	104	20.4	164	32.1
45	29	26.3	29	31.2	28	5.8	45	8.8	105	20.6	165	32.3
46	29	26.5	29	31.4	28	6.0	46	9.0	106	20.8	166	32.5
47	29	26.8	29	31.7	28	6.3	47	9.2	107	21.0	167	32.7
48	29	27.0	29	31.9	28	6.5	48	9.4	108	21.2	168	32.9
49	29	27.3	29	32.2	28	6.7	49	9.6	109	21.3	169	33.1
50	29	27.5	29	32.4	28	7.0	50	9.8	110	21.5	170	33.3
51	29	27.8	29	32.7	28	7.2	51	10.0	111	21.7	171	33.5
52	29	28.0	29	32.9	28	7.5	52	10.2	112	21.9	172	33.7
53	29	28.3	29	33.2	28	7.7	53	10.4	113	22.1	173	33.9
54	29	28.5	29	33.4	28	7.9	54	10.6	114	22.3	174	34.1
55	29	28.8	29	33.7	28	8.2	55	10.8	115	22.5	175	34.3
56	29	29.0	29	33.9	28	8.4	56	11.0	116	22.7	176	34.5
57	29	29.3	29	34.2	28	8.7	57	11.2	117	22.9	177	34.7
58	29	29.5	29	34.4	28	8.9	58	11.4	118	23.1	178	34.9
59	29	29.8	29	34.7	28	9.1	59	11.6	119	23.3	179	35.1
60	29	30.0	29	34.9	28	9.4	60	11.8	120	23.5	180	35.3

1 h 58 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	29 30.0	29 34.9	28 9.4	0 .0	60 11.9	120 23.7
1	29 30.3	29 35.2	28 9.6	1 .2	61 12.0	121 23.9
2	29 30.5	29 35.4	28 9.8	2 .4	62 12.2	122 24.1
3	29 30.8	29 35.7	28 10.1	3 .6	63 12.4	123 24.3
4	29 31.0	29 35.9	28 10.3	4 .8	64 12.6	124 24.5
5	29 31.3	29 36.2	28 10.6	5 1.0	65 12.8	125 24.7
6	29 31.5	29 36.4	28 10.8	6 1.2	66 13.0	126 24.9
7	29 31.8	29 36.7	28 11.0	7 1.4	67 13.2	127 25.1
8	29 32.0	29 36.9	28 11.3	8 1.6	68 13.4	128 25.3
9	29 32.3	29 37.2	28 11.5	9 1.8	69 13.6	129 25.5
10	29 32.5	29 37.4	28 11.8	10 2.0	70 13.8	130 25.7
11	29 32.8	29 37.7	28 12.0	11 2.2	71 14.0	131 25.9
12	29 33.0	29 37.9	28 12.2	12 2.4	72 14.2	132 26.1
13	29 33.3	29 38.2	28 12.5	13 2.6	73 14.4	133 26.3
14	29 33.5	29 38.4	28 12.7	14 2.8	74 14.6	134 26.5
15	29 33.8	29 38.7	28 12.9	15 3.0	75 14.8	135 26.7
16	29 34.0	29 38.9	28 13.2	16 3.2	76 15.0	136 26.9
17	29 34.3	29 39.2	28 13.4	17 3.4	77 15.2	137 27.1
18	29 34.5	29 39.4	28 13.7	18 3.6	78 15.4	138 27.3
19	29 34.8	29 39.7	28 13.9	19 3.8	79 15.6	139 27.5
20	29 35.0	29 39.9	28 14.1	20 4.0	80 15.8	140 27.7
21	29 35.3	29 40.2	28 14.4	21 4.1	81 16.0	141 27.8
22	29 35.5	29 40.4	28 14.6	22 4.3	82 16.2	142 28.0
23	29 35.8	29 40.7	28 14.9	23 4.5	83 16.4	143 28.2
24	29 36.0	29 40.9	28 15.1	24 4.7	84 16.6	144 28.4
25	29 36.3	29 41.2	28 15.3	25 4.9	85 16.8	145 28.6
26	29 36.5	29 41.4	28 15.6	26 5.1	86 17.0	146 28.8
27	29 36.8	29 41.7	28 15.8	27 5.3	87 17.2	147 29.0
28	29 37.0	29 41.9	28 16.0	28 5.5	88 17.4	148 29.2
29	29 37.3	29 42.2	28 16.3	29 5.7	89 17.6	149 29.4
30	29 37.5	29 42.4	28 16.5	30 5.9	90 17.8	150 29.6
31	29 37.8	29 42.7	28 16.8	31 6.1	91 18.0	151 29.8
32	29 38.0	29 42.9	28 17.0	32 6.3	92 18.2	152 30.0
33	29 38.3	29 43.2	28 17.2	33 6.5	93 18.4	153 30.2
34	29 38.5	29 43.4	28 17.5	34 6.7	94 18.6	154 30.4
35	29 38.8	29 43.7	28 17.7	35 6.9	95 18.8	155 30.6
36	29 39.0	29 43.9	28 18.0	36 7.1	96 19.0	156 30.8
37	29 39.3	29 44.2	28 18.2	37 7.3	97 19.2	157 31.0
38	29 39.5	29 44.4	28 18.4	38 7.5	98 19.4	158 31.2
39	29 39.8	29 44.7	28 18.7	39 7.7	99 19.6	159 31.4
40	29 40.0	29 44.9	28 18.9	40 7.9	100 19.8	160 31.6
41	29 40.3	29 45.2	28 19.1	41 8.1	101 19.9	161 31.8
42	29 40.5	29 45.4	28 19.4	42 8.3	102 20.1	162 32.0
43	29 40.8	29 45.7	28 19.6	43 8.5	103 20.3	163 32.2
44	29 41.0	29 45.9	28 19.9	44 8.7	104 20.5	164 32.4
45	29 41.3	29 46.2	28 20.1	45 8.9	105 20.7	165 32.6
46	29 41.5	29 46.4	28 20.3	46 9.1	106 20.9	166 32.8
47	29 41.8	29 46.7	28 20.6	47 9.3	107 21.1	167 33.0
48	29 42.0	29 47.0	28 20.8	48 9.5	108 21.3	168 33.2
49	29 42.3	29 47.2	28 21.1	49 9.7	109 21.5	169 33.4
50	29 42.5	29 47.5	28 21.3	50 9.9	110 21.7	170 33.6
51	29 42.8	29 47.7	28 21.5	51 10.1	111 21.9	171 33.8
52	29 43.0	29 48.0	28 21.8	52 10.3	112 22.1	172 34.0
53	29 43.3	29 48.2	28 22.0	53 10.5	113 22.3	173 34.2
54	29 43.5	29 48.5	28 22.3	54 10.7	114 22.5	174 34.4
55	29 43.8	29 48.7	28 22.5	55 10.9	115 22.7	175 34.6
56	29 44.0	29 49.0	28 22.7	56 11.1	116 22.9	176 34.8
57	29 44.3	29 49.2	28 23.0	57 11.3	117 23.1	177 35.0
58	29 44.5	29 49.5	28 23.2	58 11.5	118 23.3	178 35.2
59	29 44.8	29 49.7	28 23.4	59 11.7	119 23.5	179 35.4
60	29 45.0	29 50.0	28 23.7	60 11.9	120 23.7	180 35.6

1 h 59 min

POPRAVKA ČASOVNOG UGLA				POPRAVKA DRUGOG REDA za časovni ugao i deklinaciju Sunca, Meseca i planeta		
s	SUNCA I PLANETA	PROLEĆNE TAČKE ♈	MESECA ☾	Δ popr.	Δ popr.	Δ popr.
	° ′	° ′	° ′	′	′	′
0	29 45.0	29 50.0	28 23.7	0 .0	60 12.0	120 23.9
1	29 45.3	29 50.2	28 23.9	1 .2	61 12.1	121 24.1
2	29 45.5	29 50.5	28 24.2	2 .4	62 12.3	122 24.3
3	29 45.8	29 50.7	28 24.4	3 .6	63 12.5	123 24.5
4	29 46.0	29 51.0	28 24.6	4 .8	64 12.7	124 24.7
5	29 46.3	29 51.2	28 24.9	5 1.0	65 12.9	125 24.9
6	29 46.5	29 51.5	28 25.1	6 1.2	66 13.1	126 25.1
7	29 46.8	29 51.7	28 25.4	7 1.4	67 13.3	127 25.3
8	29 47.0	29 52.0	28 25.6	8 1.6	68 13.5	128 25.5
9	29 47.3	29 52.2	28 25.8	9 1.8	69 13.7	129 25.7
10	29 47.5	29 52.5	28 26.1	10 2.0	70 13.9	130 25.9
11	29 47.8	29 52.7	28 26.3	11 2.2	71 14.1	131 26.1
12	29 48.0	29 53.0	28 26.5	12 2.4	72 14.3	132 26.3
13	29 48.3	29 53.2	28 26.8	13 2.6	73 14.5	133 26.5
14	29 48.5	29 53.5	28 27.0	14 2.8	74 14.7	134 26.7
15	29 48.8	29 53.7	28 27.3	15 3.0	75 14.9	135 26.9
16	29 49.0	29 54.0	28 27.5	16 3.2	76 15.1	136 27.1
17	29 49.3	29 54.2	28 27.7	17 3.4	77 15.3	137 27.3
18	29 49.5	29 54.5	28 28.0	18 3.6	78 15.5	138 27.5
19	29 49.8	29 54.7	28 28.2	19 3.8	79 15.7	139 27.7
20	29 50.0	29 55.0	28 28.5	20 4.0	80 15.9	140 27.9
21	29 50.3	29 55.2	28 28.7	21 4.2	81 16.1	141 28.1
22	29 50.5	29 55.5	28 28.9	22 4.4	82 16.3	142 28.3
23	29 50.8	29 55.7	28 29.2	23 4.6	83 16.5	143 28.5
24	29 51.0	29 56.0	28 29.4	24 4.8	84 16.7	144 28.7
25	29 51.3	29 56.2	28 29.6	25 5.0	85 16.9	145 28.9
26	29 51.5	29 56.5	28 29.9	26 5.2	86 17.1	146 29.1
27	29 51.8	29 56.7	28 30.1	27 5.4	87 17.3	147 29.3
28	29 52.0	29 57.0	28 30.4	28 5.6	88 17.5	148 29.5
29	29 52.3	29 57.2	28 30.6	29 5.8	89 17.7	149 29.7
30	29 52.5	29 57.5	28 30.8	30 6.0	90 17.9	150 29.9
31	29 52.8	29 57.7	28 31.1	31 6.2	91 18.1	151 30.1
32	29 53.0	29 58.0	28 31.3	32 6.4	92 18.3	152 30.3
33	29 53.3	29 58.2	28 31.6	33 6.6	93 18.5	153 30.5
34	29 53.5	29 58.5	28 31.8	34 6.8	94 18.7	154 30.7
35	29 53.8	29 58.7	28 32.0	35 7.0	95 18.9	155 30.9
36	29 54.0	29 59.0	28 32.3	36 7.2	96 19.1	156 31.1
37	29 54.3	29 59.2	28 32.5	37 7.4	97 19.3	157 31.3
38	29 54.5	29 59.5	28 32.8	38 7.6	98 19.5	158 31.5
39	29 54.8	29 59.7	28 33.0	39 7.8	99 19.7	159 31.7
40	29 55.0	29 60.0	28 33.2	40 8.0	100 19.9	160 31.9
41	29 55.3	30 .2	28 33.5	41 8.2	101 20.1	161 32.1
42	29 55.5	30 .5	28 33.7	42 8.4	102 20.3	162 32.3
43	29 55.8	30 .7	28 33.9	43 8.6	103 20.5	163 32.5
44	29 56.0	30 1.0	28 34.2	44 8.8	104 20.7	164 32.7
45	29 56.3	30 1.2	28 34.4	45 9.0	105 20.9	165 32.9
46	29 56.5	30 1.5	28 34.7	46 9.2	106 21.1	166 33.1
47	29 56.8	30 1.7	28 34.9	47 9.4	107 21.3	167 33.3
48	29 57.0	30 2.0	28 35.1	48 9.6	108 21.5	168 33.5
49	29 57.3	30 2.2	28 35.4	49 9.8	109 21.7	169 33.7
50	29 57.5	30 2.5	28 35.6	50 10.0	110 21.9	170 33.9
51	29 57.8	30 2.7	28 35.9	51 10.2	111 22.1	171 34.1
52	29 58.0	30 3.0	28 36.1	52 10.4	112 22.3	172 34.3
53	29 58.3	30 3.2	28 36.3	53 10.6	113 22.5	173 34.5
54	29 58.5	30 3.5	28 36.6	54 10.8	114 22.7	174 34.7
55	29 58.8	30 3.7	28 36.8	55 11.0	115 22.9	175 34.9
56	29 59.0	30 4.0	28 37.0	56 11.2	116 23.1	176 35.1
57	29 59.3	30 4.2	28 37.3	57 11.4	117 23.3	177 35.3
58	29 59.5	30 4.5	28 37.5	58 11.6	118 23.5	178 35.5
59	29 59.8	30 4.7	28 37.8	59 11.8	119 23.7	179 35.7
60	30 .0	30 5.0	28 38.0	60 12.0	120 23.9	180 35.9

TABLICA ZA PRETVARANJE

UGAONIH U VREMENSKE VREDNOSTI

°	h min	°	h min	°	h min	°	h min	°	h min	°	h min
0	0 0	60	4 0	120	8 0	180	12 0	240	16 0	300	20 0
1	0 4	61	4 4	121	8 4	181	12 4	241	16 4	301	20 4
2	0 8	62	4 8	122	8 8	182	12 8	242	16 8	302	20 8
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56
15	1 0	75	5 0	135	9 0	195	13 0	255	17 0	315	21 0
16	1 4	76	5 4	136	9 4	196	13 4	256	17 4	316	21 4
17	1 8	77	5 8	137	9 8	197	13 8	257	17 8	317	21 8
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56
30	2 0	90	6 0	150	10 0	210	14 0	270	18 0	330	22 0
31	2 4	91	6 4	151	10 4	211	14 4	271	18 4	331	22 4
32	2 8	92	6 8	152	10 8	212	14 8	272	18 8	332	22 8
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56
45	3 0	105	7 0	165	11 0	225	15 0	285	19 0	345	23 0
46	3 4	106	7 4	166	11 4	226	15 4	286	19 4	346	23 4
47	3 8	107	7 8	167	11 8	227	15 8	287	19 8	347	23 8
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56
60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	360	24 0

′	min s
0	0 0
1	0 4
2	0 8
3	0 12
4	0 16
5	0 20
6	0 24
7	0 28
8	0 32
9	0 36
10	0 40
11	0 44
12	0 48
13	0 52
14	0 56
15	1 0
16	1 4
17	1 8
18	1 12
19	1 16
20	1 20
21	1 24
22	1 28
23	1 32
24	1 36
25	1 40
26	1 44
27	1 48
28	1 52
29	1 56
30	2 0
31	2 4
32	2 8
33	2 12
34	2 16
35	2 20
36	2 24
37	2 28
38	2 32
39	2 36
40	2 40
41	2 44
42	2 48
43	2 52
44	2 56
45	3 0
46	3 4
47	3 8
48	3 12
49	3 16
50	3 20
51	3 24
52	3 28
53	3 32
54	3 36
55	3 40
56	3 44
57	3 48
58	3 52
59	3 56
60	4 0

″	s
0	.00
1	.07
2	.13
3	.20
4	.27
5	.33
6	.40
7	.47
8	.53
9	.60
10	.67
11	.73
12	.80
13	.87
14	.93
15	1.00
16	1.07
17	1.13
18	1.20
19	1.27
20	1.33
21	1.40
22	1.47
23	1.53
24	1.60
25	1.67
26	1.73
27	1.80
28	1.87
29	1.93
30	2.00
31	2.07
32	2.13
33	2.20
34	2.27
35	2.33
36	2.40
37	2.47
38	2.53
39	2.60
40	2.67
41	2.73
42	2.80
43	2.87
44	2.93
45	3.00
46	3.07
47	3.13
48	3.20
49	3.27
50	3.33
51	3.40
52	3.47
53	3.53
54	3.60
55	3.67
56	3.73
57	3.80
58	3.87
59	3.93
60	4.00

VREMENSKIH U UGAONE

h	°
0	0
1	15
2	30
3	45
4	60
5	75
6	90
7	105
8	120
9	135
10	150
11	165
12	180
13	195
14	210
15	225
16	240
17	255
18	270
19	285
20	300
21	315
22	330
23	345
24	360

$\frac{s}{10}$	″
.00	.00
.10	1.50
.20	3.00
.30	4.50
.40	6.00
.50	7.50
.60	9.00
.70	10.50
.80	12.00
.90	13.50
1.00	15.00

$\frac{s}{100}$	″
.00	.00
.01	.15
.02	.30
.03	.45
.04	.60
.05	.75
.06	.90
.07	1.05
.08	1.20
.09	1.35
.10	1.50

min	° ′
s	′ ″
0	0 0
1	0 15
2	0 30
3	0 45
4	1 0
5	1 15
6	1 30
7	1 45
8	2 0
9	2 15
10	2 30
11	2 45
12	3 0
13	3 15
14	3 30
15	3 45
16	4 0
17	4 15
18	4 30
19	4 45
20	5 0
21	5 15
22	5 30
23	5 45
24	6 0
25	6 15
26	6 30
27	6 45
28	7 0
29	7 15
30	7 30
31	7 45
32	8 0
33	8 15
34	8 30
35	8 45
36	9 0
37	9 15
38	9 30
39	9 45
40	10 0
41	10 15
42	10 30
43	10 45
44	11 0
45	11 15
46	11 30
47	11 45
48	12 0
49	12 15
50	12 30
51	12 45
52	13 0
53	13 15
54	13 30
55	13 45
56	14 0
57	14 15
58	14 30
59	14 45
60	15 0

⋆ ★ ★ ★ ⋆

Uputstvo

ZA

UPOTREBU NAUTIČKOG GODIŠNJAKA

UPUTSTVO
za upotrebu Nautičkog godišnjaka

Nautički godišnjak se sastoji od dva osnovna dela:
1. **Promenljivog** (efemeride Sunca, Meseca, Venere, Marsa, Jupitera, Saturna ...) i
2. **Stalnog** dela.

Efemeride se menjaju svake godine, dok su u stalnom delu prilozi koji se ne menjaju.

Efemeride sadrže:

a) Mesečeve mene, perigej, apogej, vidljivost planeta, početke godišnjih doba, pomračenje Sunca i Meseca, te kalendar za 2008. godinu;

b) časovni ugao i deklinaciju Sunca, Meseca, Venere, Marsa, Jupitera i Saturna, časovni ugao Prolećne tačke za svaki parni čas univerzalnog vremena sa jednočasovnim srednjim i stvarnim razlikama;

c) vreme izlaza i zalaza Sunca i Meseca sa jednočasovnim izmenama za Mesec, i trajanje građanskog i astronomskog sumraka za svaki datum za geografske širine od 60° N do 60° S;

d) jednačinu vremena za 00^h i 12^h univerzalnog vremena sa jednočasovnom izmenom, vreme gornjeg prolaza Sunca kroz meridijan u Griniču i prividni poluprečnik Sunca (r);

e) vreme gornjeg prolaza Meseca kroz meridijan u Griniču sa jednočasovnom izmenom, horizontsku paralaksu Meseca i njegov prividni poluprečnik za 00^h u Griniču. Dalje slede starost Meseca u danima i glavne faze (mene) za određene dane;

f) vreme gornjeg prolaza planeta kroz meridijan Griniča, horizontsku paralaksu, surektascenziju i prividnu veličinu za 00^h univerzalnog vremena;

g) surektascenzije, deklinacije i vremena gornjih prolaza zvezda kroz meridijan Griniča za svaki prvi dan u mesecu;

h) podatke za Severnjaču koje čine Tablice popravki I, II i III za određivanje geografske širine pomoću Severnjače i tablice azimuta Severnjače;

i) ovo uputstvo.

Sadržaj **stalnog** dela je:

a) interpolacione tablice za izračunavanje trenutaka izlaza-zalaza Sunca i Meseca za $\varphi = 0°$ do 30° i za $\varphi = 30°$ do 60°;

b) interpolacione tablice za određivanje $\lambda\nu$ kao popravke srednjeg vremena pri izračunavanju trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan;

c) interpolacione tablice za popravku časovnog ugla Sunca i planeta, Prolećne tačke i Meseca i za popravku drugog reda za časovni ugao navedenih nebeskih tela. Tablice omogućuju i popravku deklinacije tih nebeskih tela, određivanje časovnog ugla i deklinacije za bilo koji trenutak;

d) pomoćne tablice za pretvaranje vremenskih u lučne vrednosti i obratno;

e) zvanična i zonska vremena i karta zonskih i zvaničnih vremena;

f) karte zvezdanog neba.

Primeri za rad sa Godišnjakom grupisani su, radi lakšeg pronalaženja, prema sličnosti. Za vreme svakog izračunavanja mora se voditi računa o predznaku koji je jednako važan kao i sama brojka, jer su sva izračunavanja u vidu algebarskog sabiranja odnosno oduzimanja, gde predznak određuje da li će se vršiti sabiranje ili oduzimanje.

PREGLED PRIMERA ZA KORIŠĆENJE NAUTIČKOG GODIŠNJAKA

1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE NEBESKIH TELA

Efemeride daju časovni ugao i deklinaciju Sunca, Meseca i planeta za svaki parni čas i datum, a pomoćne interpolacione tablice omogućuju određivanje časovnog ugla i deklinacije za bilo koji trenutak.

Popravka časovnog ugla određuje se pomoću interpolacionih tablica u koloni „Popravka časovnog ugla“, a popravka drugog reda za časovni ugao na istoj strani u koloni „Popravka drugog reda za časovni ugao i deklinaciju Sunca, Meseca i planeta“.

Prva popravka časovnog ugla određena je pod pretpostavkom da jednočasovne promene časovnih uglova za Sunce iznose 15°, za Prolećnu tačku 15°02′.5 i za Mesec 14°19′. Popravka drugog reda časovnog ugla Sunca, Meseca i planeta jeste popravka tih srednjih promena, jer stvarne časovne promene časovnih uglova razlikuju se za veće ili manje vrednosti od usvojenih srednjih promena. Veličina Δ za račun popravke drugog reda nalazi se na dnu efemerida Sunca i planeta, za Mesec desno od vrednosti časovnog ugla, a za popravku drugog reda Prolećne tačke ne uzima se u obzir jer su odstupanja od srednje vrednosti 15°02′.5 praktično zanemarljiva.

Određivanje deklinacije nekog nebeskog tela za određeni trenutak vršimo na taj način da u efemeridama tog dana za parni čas pronađemo osnovnu vrednost deklinacije. Popravku za određeni trenutak pronalazimo u interpolacionim tablicama u koloni „Popravka drugog reda za časovni ugao i deklinaciju Sunca, Meseca i planeta“, a pomoću vrednosti Δ.

1.1. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE SUNCA

▶**PRIMER 1.** Odrediti mesni časovni ugao i deklinaciju Sunca za 14. april 2008. godine u UT $= 7^h31^m46^s$ na $\lambda = 96°14'.6$E.

a) časovni ugao

Sa strane za 14. april S za 6^h	$269°55'.7$
Iz interpolacionih tablica za $1^h31^m46^s$ popravka časovnog ugla Sunca	$22°56'.5$
Iz interpolacionih tablica za 1^h31^m popravka drugog reda za S($\Delta = +2$)	$0'.3$
S	$292°52'.5$
$+\lambda$	$+\ 96°14'.6$
s	$389°07'.1 \rightarrow s_W = 29°07'.1$

b) deklinacija

Sa strane za 14. april δ za 6^h	$+9°33'.4$
Iz interpol. tablica za 1^h31^m popravka za $\delta(\Delta = +9)$	$+\ 1'.4$
δ	$+9°34'.8$

▶**PRIMER 2.** Odrediti mesni časovni ugao i deklinaciju Sunca za 18. septembar 2008. godine u UT $= 13^h05^m14^s$ na $\lambda = 28°53'.6$W.

a) časovni ugao

Sa strane za 18. septembar S za 12^h	$1°30'.0$
Iz interpolacionih tablica za $1^h5^m14^s$ popravka časovnog ugla Sunca	$16°18'.5$
Popravka drugog reda za S($\Delta = +2$)	$0'.2$
S	$17°48'.7$
$+\lambda$	$-\ 28°53'.6$
s_W	$348°55'.1 \rightarrow s_E = 11°04'.9$

b) deklinacija

Sa strane za 18. septembar δ za 12^h	$+1°36'.9$
Iz interpol. tablica za 1^h5^m popravka za $\delta(\Delta = -10)$	$-\ 1'.1$
δ	$+1°35'.8$

1.2. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE MESECA

▶**PRIMER 3.** Odrediti mesni časovni ugao i deklinaciju Meseca za 15. mart 2008. godine u UT $= 8^h15^m25^s$ na $\lambda = 15^\circ32'.0$W.

a) časovni ugao

Sa strane za 15. mart S za 8^h	$195^\circ52'.6$
Iz interpolacionih tablica za $0^h15^m25^s$ popravka časovnog ugla Meseca	$3^\circ40'.7$
Iz interpol. tablica za 0^h15^m popravka za S($\Delta = +48$)	$1'.2$
S	$198^\circ34'.5$
$+\lambda$	$-\ 15^\circ32'.0$
s_W	$183^\circ2'.5 \rightarrow s_E = 176^\circ57'.5$

b) deklinacija

Sa strane za 15. mart δ za 8^h	$27^\circ19'.9$
Iz interpol. tablica za 0^h15^m popravka za $\delta(\Delta = -39)$	$-\ 1'.0$
δ	$27^\circ18'.9$

▶**PRIMER 4.** Odrediti mesni časovni ugao i deklinaciju Meseca za 20. jun 2008. godine u UT $= 10^h31^m18^s$ na $\lambda = 34^\circ23'.8$ E.

a) časovni ugao

Sa strane za 20. jun S za 10^h	$128^\circ59'.8$
Iz interpolacionih tablica za $0^h31^m18^s$ popravka časovnog ugla Meseca	$7^\circ28'.1$
Iz interpol. tablica za 0^h31^m popravka za S($\Delta = +109$)	$5'.7$
S	$136^\circ33'.6$
$+\lambda$	$+\ 34^\circ23'.8$
s_W	$170^\circ57'.4 \rightarrow s_E = 189^\circ\ 2'.6$

b) deklinacija

Sa strane za 20. jun δ za 10^h	$-24^\circ51'.8$
Iz interpol. tablica za 0^h31^m popravka za $\delta(\Delta = +65)$	$+\ 3'.4$
δ	$-24^\circ48'.4$

1.3. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE PLANETA

▶**PRIMER 5.** Odrediti mesni časovni ugao i deklinaciju Venere za 7. decembar 2008. godine u UT $= 21^h15^m7^s$ na $\lambda = 58^\circ34'.2$ E.

a) časovni ugao

Sa strane za 7. decembar S za 20^h	$74^\circ25'.2$
Iz interpolacionih tablica za $1^h15^m7^s$ popravka časovnog ugla planete	$18^\circ46'.8$
Iz interpolacionih tablica za 1^h15^m popravka drugog reda za S($\Delta = -6$)	$-\ 0'.8$
S	$93^\circ11'.2$
$+\lambda$	$+\ 58^\circ34'.2$
s_W	$151^\circ45'.4 \rightarrow s_E = 208^\circ14'.6$

b) deklinacija

Sa strane za 7. decembar δ za 20^h	$-22^\circ29'.6$
Iz interpol. tablica za 1^h15^m popravka za $\delta(\Delta = +\ 6)$	$+\ 0'.8$
δ	$-22^\circ28'.8$

▶**PRIMER 6.** Odrediti mesni časovni ugao i deklinaciju Jupitera za 23. oktobar 2008. godine u UT $= 8^h55^m28^s$ na $\lambda = 145^\circ20'.1$W.

a) časovni ugao

Sa strane za 23. oktobar S za 8^h	$225^\circ\ 6'.8$
Iz interpolacionih tablica za $0^h55^m28^s$ popravka časovnog ugla planete	$13^\circ52'.0$
Iz interpolacionih tablica za 0^h55^m popravka drugog reda za S($\Delta = +21$)	$1'.9$
S	$239^\circ\ 0'.7$
$+\lambda$	$-145^\circ20'.1$
s	$93^\circ40'.6 \rightarrow s_E = 266^\circ19'.4$

b) deklinacija

Sa strane za 23. oktobar δ za 8^h	$-22^\circ52'.1$
Iz interpol. tablica za 0^h55^m popravka za $\delta(\Delta = 0)$	$0'.0$
δ	$-22^\circ52'.1$

1.4. ODREĐIVANJE ČASOVNOG UGLA I DEKLINACIJE ZVEZDE

Za određivanje časovnog ugla zvezde prvo se određuje časovni ugao Prolećne tačke S_Υ, odnosno vrednost zvezdanog vremena izražena u stepenima. Njoj dodajemo surektascenziju ($360^\circ - \alpha$) te zvezde prema jednačini $S_* = S_\Upsilon - \alpha_*$, odnosno $S_* = S_\Upsilon + (360^\circ - \alpha_*)$. Rektascenzija odnosno surektascenzija zvezda se tokom meseca neznatno menjaju, pa su stoga date njihove vrednosti samo za prvi dan meseca. U slučaju veće promene surektascenzije tokom meseca, njena interpolacija vrši se napamet. Isto tako, deklinacije zvezda date su za prvi dan meseca. U slučaju potrebe interpolacije, ista se vrši napamet.

▶**PRIMER 7.** Odrediti mesni časovni ugao i deklinaciju zvezde Regulus (α Leo) za 16. mart 2008. godine u UT = $18^h11^m26^s$ na $\lambda = 62°13'.2$W.

a) časovni ugao Prolećne (Υ) tačke

Sa strane za 16. mart S_Υ za 18^h	$84°41'.3$
Iz interpolacionih tablica za $0^h11^m26^s$ popravka časovnog ugla Υ tačke	$2°52'.0$
S_Υ	$87°33'.3$
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 24 za 1. mart): δ	$+11°55'.5$

b) časovni ugao zvezde

S_Υ	$87°33'.3$
Iz tablice surektascenzija nautičkih zvezda pod r.b. 24 za 1. mart	$207°47'.4$
S_*	$295°20'.7$
$+\lambda$	$-\ 62°13'.2$
s_*	$233°\ 7'.5$
s_E	$126°52'.5$

▶**PRIMER 8.** Odrediti mesni časovni ugao i deklinaciju zvezde Deneb (α Cyg) za 10. avgust 2008. godine u UT = $21^h42^m8^s$ na $\lambda = 93°14'.2$E.

a) časovni ugao Prolećne (Υ) tačke

Sa strane za 10. avgust S_Υ za 20^h	$259°39'.6$
Iz interpolacionih tablica za $1^h42^m8^s$ popravka časovnog ugla Υ tačke	$25°36'.3$
S_Υ	$285°15'.9$
Deklinacija (iz tablice deklinacija nautičkih zvezda pod r.b. 50 za 1. avgust): δ	$+\ 45°18'.7$

b) časovni ugao zvezde

S_Υ	$285°15'.9$
Iz tablice surektascenzija nautičkih zvezda pod r.b. 50 za 1. avgust	$49°33'.6$
S_*	$334°49'.5$
$+\lambda$	$+\ 93°14'.2$
s_*	$428°\ 3'.7$
s_*	$68°\ 3'.7$

2. ODREĐIVANJE IZLAZA I ZALAZA NEBESKIH TELA

2.1. ODREĐIVANJE IZLAZA I ZALAZA SUNCA, POČETKA I ZAVRŠETKA GRAĐANSKOG I ASTRONOMSKOG SUMRAKA

Vremena izlaza i zalaza Sunca (gornjeg ruba), te trajanja sumraka, data su u efemeridama za severne i južne širine od 0° do 60°. Početak građanskog ili astronomskog svitanja određuje se oduzimanjem vremena trajanja sumraka od vremena izlaza Sunca. Završetak građanskog ili astronomskog sumraka određuje se dodavanjem vremena trajanja sumraka vremenu zalaza Sunca. Data su vremena izlaza i zalaza Sunca, te trajanja sumraka, za svaki dan. Potrebno je izvršiti interpolaciju samo za određenu geografsku širinu pomoću dve interpolacione tablice. Prva tablica je za geografske širine od 0° do 30° N i S, a druga za širine od 30° do 60° N i S. Interpolacija vremena trajanja sumraka vrši se po potrebi samo za celobrojne vrednosti minuta.

▶**PRIMER 9.** Odrediti vreme izlaza i zalaza Sunca, početak građanskog svitanja i završetak građanskog sumraka za 5. jul 2008. godine na $\varphi = 48°28'.2$N, $\lambda = 72°43'.6$E, $\varphi = 48°.5$S, $\lambda = 4^h50^m.9$ ($x = +5^h$).

a) izlaz

UT = t_s izlaza za $\varphi = 45°$S	$4^h20^m.0$
Popravka za 3°.5 iz interpolacionih tablica ($\Delta = -22^m$)	$-\ 15^m.4$
t_s izlaza za $\varphi = 48°.5$S	$4^h\ 4^m.6$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$4^h13^m.7$
$-$ trajanje građanskog sumraka	$-\ 42^m.0$
početak građanskog svitanja	$3^h31^m.7$

b) zalaz

UT = t_s zalaza za $\varphi = 45°$S	$19^h49^m.0$
Popravka za 3°.5 iz interpolacionih tablica ($\Delta = +22^m$)	$+\ 15^m.4$
t_s zalaza za $\varphi = 48°.5$S	$20^h\ 4^m.4$
$+(x - \lambda)$	$+\ 9^m.1$
t_x	$20^h13^m.5$
$+$ trajanje građanskog sumraka	$+\ 42^m.0$
završetak građanskog sumraka	$20^h55^m.5$

▶**PRIMER 10.** Odrediti vreme izlaza i zalaza Sunca, početak astronomskog svitanja i završetak astronomskog sumraka za 21. septembar 2008. godine na $\varphi = 22°14'.0$N, $\lambda = 56°41'.2$W, $\varphi = 22°.2$N, $\lambda = 3^h46^m.7$ ($x = -4^h$).

a) izlaz

UT = t_s izlaza za $\varphi = 20°$N	$5^h49^m.0$
Popravka za 2°.2 iz interpolacionih tablica ($\Delta = -1^m$)	$-\ 0^m.2$

b) zalaz

UT = t_s zalaza za $\varphi = 20°$N	$17^h57^m.0$
Popravka za 2°.2 iz interpolacionih tablica ($\Delta = 1^m$)	$+\ 0^m.2$

t_s izlaza za $\varphi = 22°.2N$	$5^h48^m.8$
$+(x - \lambda)$	$-\ 13^m.3$
t_x	$5^h35^m.5$
$-$ trajanje astronomskog sumraka	$-1^h14^m.5$
početak astronomskog svitanja	$4^h21^m.0$

t_s zalaza za $\varphi = 22°.2N$	$17^h57^m.2$
$+(x - \lambda)$	$-\ 13^m.3$
t_x	$17^h43^m.9$
$+$ trajanje astronomskog sumraka	$+\ 1^h14^m.5$
završetak astronomskog sumraka	$18^h58^m.4$

2.2. ODREĐIVANJE IZLAZA I ZALAZA MESECA

Vremena izlaza i zalaza Meseca (gornjeg ruba) za svaki dan, za severne i južne geografske širine od 0° do 60°, te njihove promene za jedan čas $\Delta/24$ date su u efemeridama. Pomoću izmene $\Delta/24$ određuje se popravka $\lambda\nu$ prilikom određivanja izlaza i zalaza Meseca. U slučaju određivanja izlaza i zalaza Meseca na istočnim geografskim dužinama u cilju postizanja tačnosti uzima se vrednost $\Delta/24$ za prethodni dan. Vrednost $\Delta/24$ je uvek pozitivna zbog kašnjenja Meseca. Popravka $\lambda\nu$ se uvek algebarski oduzima od vremena izlaza ili zalaza Meseca u Griniču. Mora da se vodi računa o znacima vrednosti $\lambda\Delta/24$. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan. Prvo se vrši interpolacija za geografsku širinu pomoću interpolacione tablice za određivanje vremena Sunčevih i Mesečevih izlaza i zalaza, a zatim se određuje popravka za geografsku dužinu.

Moguće je da za određeni dan i širinu u efemeridama nema potrebnih podataka. Ta mesta označena su tačkama. U tim slučajevima koriste se podaci za naredni dan.

▶**PRIMER 11.** Odrediti vreme izlaza i zalaza Meseca za 19. jun 2008. godine na $\varphi = 17°36'.0N$, $\lambda = 72°15'.0E$, $\varphi = 17°.6N$, $\lambda = 4^h49^m.0E$ $(x = +5^h)$.

a) izlaz

$UT = t_s$ izlaza za $\varphi = 10°N$	$19^h14^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = +23^m)$	$+\ 17^m.5$
UT izlaza za $\varphi = 17°.6N$	$19^h31^m.5$
$\lambda = 72°.3E$	
$\Delta/24 = \nu = 2^m.0 \quad -\lambda\nu$	$-\ 9^m.6$
t_s	$19^h21^m.9$
$+(x - \lambda)$	$+\ 11^m.0$
t_x	$19^h32^m.9$

b) zalaz

$UT = t_s$ zalaza za $\varphi = 10°N$	$6^h\ 6^m.0$
Popravka za $7°.6$ iz interpolacionih tabl. $(\Delta = -23^m)$	$-\ 17^m.5$
UT zalaza za $\varphi = 17°.6N$	$5^h48^m.5$
$\lambda = 72°.3E$	
$\Delta/24 = \nu = 2^m.2 \quad -\lambda\nu$	$-\ 10^m.6$
t_s	$5^h37^m.9$
$+(x - \lambda)$	$+\ 11^m.0$
t_x	$5^h48^m.9$

▶**PRIMER 12.** Odrediti vreme izlaza i zalaza Meseca za 23. oktobar 2008. godine na $\varphi = 33°25'.0S$, $\lambda = 38°53'.0W$, $\varphi = 33°.4S$, $\lambda = 2^h35^m.5W$ $(x = -3^h)$.

a) izlaz

$UT = t_s$ izlaza za $\varphi = 30°S$	$+\ 1^h57^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = +\ 8^m)$	$+\ 5^m.5$
UT izlaza za $\varphi = 33°.4S$	$+\ 2^h\ 2^m.5$
$\lambda = 38°.9W$	
$\Delta/24 = \nu = 1^m.4 \quad -\lambda\nu$	$-\ 3^m.6$
t_s	$+\ 1^h58^m.9$
$+(x - \lambda)$	$-\ 24^m.5$
t_x	$+\ 1^h34^m.4$

b) zalaz

$UT = t_s$ zalaza za $\varphi = 30°S$	$13^h16^m.0$
Popravka za $3°.4$ iz interpolacionih tabl. $(\Delta = -\ 7^m)$	$-\ 4^m.8$
UT zalaza za $\varphi = 33°.4S$	$13^h11^m.2$
$\lambda = 38°.9W$	
$\Delta/24 = \nu = 2^m.5 \quad -\lambda\nu$	$-\ 6^m.5$
t_s	$13^h\ 5^m.7$
$+(x - \lambda)$	$-\ 24^m.5$
t_x	$12^h41^m.2$

2.3. ODREĐIVANJE IZLAZA I ZALAZA PLANETA I ZVEZDA

Trenutak izlaza i zalaza planeta i zvezda se ne određuje jer se njihov izlaz i zalaz ne vide. Ali u slučaju potrebe može se odrediti vrednost poludnevnog luka na osnovu deklinacije određene zvezde i geografske širine posmatrača ili se ista vrednost odredi pomoću Nautičkih tablica na osnovu zadatih vrednosti. Tako određena vrednost poludnevnog luka oduzima se od vremena gornjeg prolaza određene zvezde kroz meridijan i dobija se vreme izlaza, ako se vrednost poludnevnog luka doda vremenu prolaza dobija se vreme zalaza.

3. ODREĐIVANJE GORNJEG PROLAZA NEBESKIH TELA KROZ MERIDIJAN

3.1. ODREĐIVANJE GORNJEG PROLAZA SUNCA KROZ MERIDIJAN

Za određivanje gornjeg prolaza Sunca kroz meridijan koristi se činjenica da Sunce u trenutku gornjeg prolaza kroz meridijan određenog mesta ima časovni ugao 0°. Zapadna geografska dužina određenog mesta, gde je časovni ugao Sunca 0°, odgovara u tom momentu časovnom uglu Sunca u Griniču, odnosno $\lambda_W = S_\odot$. Za istočne geografske širine koristi se jednačina $(360^\circ - \lambda_E) = S_\odot$. Dakle moramo odrediti univerzalno vreme u kojem je časovni ugao Sunca $S_\odot$ jednak λ_W ili $(360^\circ - \lambda_E)$. Tako određenom vremenu dodaje se zonski indeks sa predznakom i dobija se zonsko vreme gornjeg prolaza Sunca kroz meridijan.

Na drugi način, gornji prolaz Sunca kroz meridijan određuje se pomoću jednačine vremena $T_p - e = UT$. U efemeridama su date vrednosti jednačine vremena $e = T_p - UT$ za 00^h i 12^h sa odgovarajućom jednočasovnom promenom. Pomoću jednačine vremena određuje se univerzalno vreme gornjeg prolaza Sunca kroz meridijan. Za istočne geografske širine koristi se $\Delta/24$ za prethodni dan radi postizanja veće tačnosti.

Treći (približni) način određivanja vremena gornjeg prolaza Sunca kroz meridijan, uz najveću moguću grešku do $\pm 0^m.2$, je ako vremenu gornjeg prolaza Sunca kroz meridijan u Griniču T_m dodamo $x - \lambda$ (primer 14b).

▶**PRIMER 13.** Odrediti vreme gornjeg prolaza Sunca kroz meridijan za 8. mart 2008. godine na $\lambda = 103^\circ 28'.8\text{W}$, $\lambda = 6^h 53^m 55^s$ $(x = -7^h)$.

a) pomoću časovnog ugla

$\lambda_W = S_\odot$	$103^\circ 28'.8$
u UT 18^h $S_\odot$	$87^\circ 20'.0$
Iz interpolacione tablice za Sunce u $1^h 04^m 35^s.2$	$16^\circ\ 8'.8$
UT	$19^h 04^m 35^s.2$
$+x$	$-\ 7^h 00^m 00^s.0$
t_x	$12^h 04^m 35^s.2$

b) pomoću jednačine vremena

t_p	$12^h 00^m 00^s.0$	e_{12^h}	$-10^m 43^s.5$
$-\lambda$	$+\ 6^h 53^m 55^s.0$	$\Delta/24$	$+\ 0^s.6$
T_p	$18^h 53^m 55^s.0$	Popravka	
$-e$	$+\ 10^m 39^s.4$	6.9×0.6	$4^s.1$
UT	$19^h 04^m 34^s.4$	e_{12^h}	$-10^m 43^s.5$
$+x$	$-\ 7^h 00^m 00^s.0$	Popravka	$+\ 4^s.1$
t_x	$12^h 04^m 34^s.4$	e	$-10^m 39^s.4$

▶**PRIMER 14.** Odrediti vreme gornjeg prolaza Sunca kroz meridijan za 22. januar 2008. godine na $\lambda = 145^\circ 52'.1\text{E}$, $\lambda = 9^h 43^m 28^s$ $(x = +10^h)$.

a) pomoću časovnog ugla

$(360^\circ - \lambda_E) = S_\odot$	$214^\circ 07'.9$
u UT 2^h $S_\odot$	$207^\circ\ 9'.5$
Iz interpolacione tablice za Sunce u $0^h 27^m 52^s.7$	$6^\circ 58'.2$
UT	$2^h 27^m 52^s.7$
$+x$	$+10^h 00^m 00^s.0$
t_x	$12^h 27^m 52^s.7$

b) skraćeni postupak

$T_m = t_m$	$12^h 11^m.5$	$T_m = t_m$	$12^h 11^m.5$
$-\lambda$	$-\ 9^h 43^m.5$	$+(x - \lambda)$	$0^h 16^m.5$
UT	$2^h 27^m.9$		
$+x$	$+10^h 00^m.0$		
t_x	$12^h 27^m.9$	t_x	$12^h 28^m.0$

3.2. ODREĐIVANJE GORNJEG PROLAZA MESECA KROZ MERIDIJAN

Način određivanja gornjeg prolaza Meseca kroz meridijan je isti kao određivanje izlaza i zalaza Meseca. Iz efemerida se dobija univerzalno vreme gornjeg prolaza Meseca kroz meridijan u Griniču uz odgovarajuću časovnu promenu $\Delta/24$. Ako se određuje popravka $\lambda\nu$ za zapadne geografske širine, vrednost $\Delta/24$ uzima se za dan prolaza Meseca kroz meridijan, a za istočne geografske širine uzima se vrednost $\Delta/24$ od prethodnog dana. Popravka $\lambda\nu$ data je u interpolacionoj tablici za izračunavanje trenutaka izlaza, zalaza i prolaza Meseca kroz meridijan.

Moguće je da za određeni dan u efemeridama nema potrebnih podataka. Ta mesta označena su tačkama. U tim slučajevima koriste se podaci za naredni dan.

▶**PRIMER 15.** Odrediti vreme gornjeg prolaza Meseca kroz meridijan za 18. januar 2008. godine na $\lambda = 48^\circ 6'.0\text{W}$.

T_m	$20^h 33^m.0$	$\Delta/24 = \nu$	$2^m.7$	x	$-\ 3^h 00^m.0$
$-\lambda\nu$	$+\ 8^m.7$	λ	$48^\circ.1$	$-\lambda$	$+\ 3^h 12^m.4$
t_m	$20^h 41^m.7$	$\lambda\nu$	$-\ 8^m.7$	$+(x - \lambda)$	$+\ 0^h 12^m.4$
$+(x - \lambda)$	$12^m.4$				
t_x	$20^h 54^m.1$				

▶**PRIMER 16.** Odrediti vreme gornjeg prolaza Meseca kroz meridijan u Griniču za 23. jun 2008. godine na $\lambda = 126^\circ 40'.2\text{E}$.

T_m	$3^h29^m.0$	$\Delta/24 = \nu$	$1^m.8$	x	$+\ 8^h00^m.0$
$-\lambda\nu$	$-\ 15^m.2$	λ	$126^\circ.7$	$-\lambda$	$-\ 8^h26^m.7$
t_m	$3^h13^m.8$	$\lambda\nu$	$15^m.2$	$+(x-\lambda)$	$-\ 0^h26^m.7$
$+(x-\lambda)$	$-\ 0^h26^m.7$				
t_x	$2^h47^m.1$				

3.3. ODREĐIVANJE GORNJEG PROLAZA PLANETA KROZ MERIDIJAN

Metodologija određivanja vremena gornjih prolaza planeta kroz meridijan ista je kao za Mesec, uz razliku da vrednost $\Delta/24$ može biti pozitivna, kada planeta kasni kao Mesec, ili negativna, kada planeta rani kao zvezde. Obično je vrednost $\Delta/24$ negativna.

Ako planeta rani u odnosu na prethodni dan na istočnim geografskim dužinama, vreme je veće od griničkog, a na zapadnim manje, t.j. suprotno nego kod Meseca. Ako planeta kasni postupak je isti kao u slučaju određivanja gornjeg prolaza Meseca kroz meridijan. Shodno tome, određuje se znak vrednosti $\lambda\nu$. Obično je planetarni dan kraći od srednjeg sunčevog, pa se može desiti da planeta u jednom danu dva puta prolazi kroz meridijan mesta, odmah posle pola noći i nešto pre pola noći.

Pošto je razlika između dva vremena dva uzastopna prolaza kroz meridijan mala, vrednost $\lambda\nu$ se ne određuje (primer 17b); univerzalno vreme prolaza kroz meridijan je isto kao mesno srednje vreme kojem se samo dodaje $(x-\lambda)$ i na taj način se određuje zonsko vreme prolaza planeta kroz meridijan mesta.

▶**PRIMER 17.** Odrediti vreme gornjeg prolaza Jupitera kroz meridijan za 14. jun 2008. godine na $\lambda = 46^\circ 17'.3\text{W}$, $\lambda = 3^h5^m.2$ $(x = -3^h)$.

a) tačan postupak

T_m	$1^h58^m.0$	λ	$3^h.1\text{W}$
$-\lambda\nu$	$0^m.5$	$\nu = \Delta/24$	$-4^m/24$
t_m	$1^h57^m.5$	$\lambda\nu = 3.1 \times \frac{-4}{24}$	$-0^m.5$
$+(x-\lambda)$	$+\ 5^m.2$		
t_x	$2^h\ 2^m.7$		

b) približan postupak—u praksi dovoljno tačan

T_m	$1^h58^m.0$
$+(x-\lambda)$	$5^m.2$
t_x	$2^h\ 3^m.2$

3.4. ODREĐIVANJE GORNJEG PROLAZA ZVEZDA KROZ MERIDIJAN

Vreme gornjeg prolaza zvezda kroz meridijan Griniča dato je u efemeridama za svaki prvi dan u mesecu. U slučaju određivanja vremena prolaza kroz meridijan za bilo koji drugi dan u mesecu, od vrednosti iz efemerida oduzima se popravka koja se nalazi na donjem delu stranice za izabrani dan.

Vreme gornjeg prolaza kroz meridijan T_m izraženo u univerzalnom vremenu može da se uzme kao mesno srednje vreme prolaza kroz meridijan posmatrača t_m, što je približno, jer zvezda dnevno rani oko 4 minuta, a što na većim geografskim dužinama stvara greške od 1 do 2 minuta. Dakle, potrebno je odrediti $\lambda\nu$, ali se to ne radi jer za svakodnevni rad tačnost je dovoljna, ako se griničko vreme prolaza kroz meridijan uzima kao mesno srednje vreme i, uz dodavanje $(x-\lambda)$, pretvara u zonsko.

▶**PRIMER 18.** Odrediti vreme gornjeg prolaza zvezde Arcturus (α Boo) kroz meridijan 23. maja 2008. godine na $\lambda = 28^\circ 14'.2\text{E}$, $\lambda = 1^h52^m.9$, $(x = +2^h)$.

Iz tablice gornjih prolaza zvezda kroz meridijan za 1. maj 2008. godine (r.b. zvezde 35) $T_m = t_m$	$23^h39^m.0$
Popravka za 23 dana iz iste tablice	$-\ 1^h30^m.5$
t_m	$22^h\ 8^m.5$
$+(x-\lambda)$	$7^m.1$
t_x	$22^h15^m.6$

4. SEVERNJAČA

4.1. ODREĐIVANJE GEOGRAFSKE ŠIRINE POMOĆU VISINE SEVERNJAČE I ODREĐIVANJE AZIMUTA SEVERNJAČE

Izmerena visina Severnjače ispravlja se radi instrumentalnih grešaka k_i i k_e, depresije i refrakcije. Rezultat ispravki je V_p, kojem se dodaju popravke I, II i III iz tablica Godišnjaka. Ulazne vrednosti tablice azimuta Severnjače su mesni časovni ugao Prolećne tačke i geografska širina posmatrača.

▶**PRIMER 19.** Odrediti geografsku širinu posmatrača pomoću visine zvezde Severnjače; odrediti njen azimut za 18. septembar 2008. godine u UT $= 22^h36^m00^s$ na $\varphi = 42^\circ23'$N i $\lambda = 38^\circ47'$W zbirne pozicije, ako je prava visina Severnjače $V_p = 41^\circ54'.2$.

a) određivanje mesnog časovnog ugla s_Υ

S_Υ za UT 22^h	$328^\circ11'.0$
Iz interpolacionih tablica popravka S_Υ za 36^m	$9^\circ\ 1'.5$
S_Υ	$337^\circ12'.5$
$+\lambda$	$-\ 38^\circ47'.0$
s_Υ	$298^\circ25'.5$

b) određivanje visine

V_p	$41^\circ54'.2$
I	$+\ 8'.0$
II	$+\ 0'.2$
III	$-\ 0'.0$
φ	$42^\circ\ 2'.4$
ω	$1^\circ.0$

5. PRETVARANJE RAZNIH VRSTA VREMENA

5.1. PRETVARANJE ZONSKOG, MESNOG SREDNJEG VREMENA I VREMENA PO ČASOVNIKU U UNIVERZALNO VREME I OBRATNO

Podaci efemerida odnose se na grinički meridijan, pa je ulazna vrednost univerzalno vreme UT.

U slučaju da časovnik osmatrača pokazuje zonsko vreme, vreme posmatranja je zonsko vreme t_x. Isto tako, može to vreme biti vreme po časovniku t_c ili mesno zonsko vreme t_s, a što nije često.

▶**PRIMER 20.** Odrediti UT ako su poznati zonsko vreme t_x, vreme po časovniku t_c i srednje mesno vreme t_s na $\lambda = 13^\circ51'.0$E, $\lambda = 0^h55^m24^s$ ($x = +1^h$).

a) prelaz sa t_x na UT

t_x	$7^h39^m19^s$
$-x$	$-1^h00^m00^s$
UT	$6^h39^m19^s$

b) prelaz sa t_c na UT

t_c	$7^h31^m55^s$
$+U$	$-\ 53^m48^s$
t_h	$6^h38^m07^s$
$+S$	$+\ 1^m12^s$
UT	$6^h39^m19^s$

c) prelaz sa t_s na UT

t_s	$7^h34^m43^s$
$-\lambda$	$-\ 55^m24^s$
UT	$6^h36^m19^s$

Napomena: U—poređenje hronometra sa časovnikom,
S—stanje hronometra.

▶**PRIMER 21.** Odrediti zonsko vreme t_x, vreme po časovniku t_c i srednje mesno vreme t_s za UT na $\lambda = 57^\circ24'.0$E, $\lambda = 3^h49^m36^s$ ($x = -4^h$).

a) prelaz sa UT na t_x

UT	$9^h46^m12^s$
$+x$	$-4^h00^m00^s$
t_x	$5^h46^m12^s$

b) prelaz sa UT na t_c

UT	$9^h46^m12.0^s$
$-S$	$+\ 2^m06^s.5$
t_h	$9^h48^m18.5^s$
$-U$	$+3^h53^m27.5^s$
t_c	$5^h54^m51.0^s$

c) prelaz sa UT na t_s

UT	$9^h46^m12^s$
$+\lambda$	$-3^h49^m36^s$
t_s	$5^h56^m36^s$

Napomena: U—poređenje hronometra sa časovnikom,
S—stanje hronometra.

▶**PRIMER 22.** Odrediti zonsko vreme t_x za mesno srednje vreme $t_s = 13^h15^m36^s$ na $\lambda = 107^\circ28'.0\,W$, $\lambda = 7^h9^m52^s$ $(x = -7)$.

a) duži postupak

t_s	$13^h15^m36^s$
$-\lambda$	$7^h09^m52^s$
UT	$20^h25^m28^s$
$+x$	$-\ 7^h00^m00^s$
t_x	$13^h25^m28^s$

b) kraći postupak

t_s	$13^h15^m36^s$	x	$-7^h00^m00^s$
$+(x-\lambda)$	$+\ 9^m52^s$	$-\lambda$	$7^h09^m52^s$
t_x	$13^h25^m28^s$	$(x-\lambda)$	9^m52^s

5.2. PRETVARANJE ZVEZDANOG VREMENA U ZONSKO I MESNO SREDNJE VREME

Određeno zvezdano vreme pretvorimo u mesni časovni ugao Prolećne tačke. Griničkи časovni ugao Prolećne tačke dobija se oduzimanjem geografske dužine od mesnog časovnog ugla Prolećne tačke. Iz efemerida pomoću griničkog časovnog ugla Prolećne tačke određujemo univerzalno vreme. Dodavanjem zonskog indeksa dobija sa zonsko vreme, ili dodavanjem geografske širine izražene u vremenu dobija se mesno srednje vreme. Moguće je da dobijemo t_x ili t_s za prethodni dan ili naredni dan od datuma za koji tražimo t_x ili t_s. U tom slučaju postupak određivanja vremena se ponavlja, ali od zapadne geografske širine se oduzima S_φ za naredni dan, a za istočne geografske širine za prethodni dan.

▶**PRIMER 23.** Odrediti zonsko vreme t_x odnosno mesno srednje vreme t_s za 19. januar 2008. godine ako je zvezdano vreme $t_z = 6^h36^m3^s$ na $\lambda = 112^\circ10'.5E$, $\lambda = 7^h28^m42^s$ $(x = +7)$.

$t_z = 6^h36^m03^s = s_\Upsilon$	$99^\circ0'.8 + 360^\circ$		
$-\lambda$	$-112^\circ10'.5$		
S_Υ	$346^\circ50'.3$		
20. januar u UT $14^h00^m00^s$	$-S_\Upsilon$	$-329^\circ19'.6$	
Iz interpol. tablice za Prolećnu tačku u $1^h10^m51^s$ UT $15^h10^m51^s$	$\leftarrow$	$17^\circ30'.7$	

a) t_s

UT	$15^h10^m51^s$
$+\lambda$	$7^h28^m42^s$
t_s	$22^h39^m43^s$

b) t_x

UT	$15^h10^m51^s$
$+x$	$+\ 7^h00^m00^s$
t_x	$22^h10^m51^s$

6. IDENTIFIKACIJA ZVEZDA POMOĆU ZVEZDANIH KARATA

Zvezdane karte u prilogu služe za opštu orijentaciju na zvezdanom nebu i prepoznavanje zvezda na dva moguća načina.

1. Meridijan posmatrača moguće je odrediti na zvezdanoj karti pomoću surektascenzije zvezde na tom meridijanu. Ako je posmatrač na zapadnoj geografskoj dužini i zvezda je tačno u meridijanu, vrednost λ_W jednaka je griničkom časovnom uglu te zvezde $(\lambda_W = S_*)$. Za posmatrača na istoj geografskoj dužini odnos je $(360^\circ - \lambda_E) = S_*$. Pošto je griničkи časovni ugao zvezde S_* jednak griničkom časovnom uglu Prolećne tačke umanjenom za rektascenziju zvezde $(S_* = S_\Upsilon - \alpha_*)$, onda je $(\alpha_* = S_\Upsilon - S_*)$. Surektascenzija je jednaka časovnom uglu zvezde umanjenom za časovni ugao Prolećne tačke $(360^\circ - \alpha_*) = S_* - S_\Upsilon$. Griničkи časovni ugao zvezde odgovara zapadnoj geografskoj dužini $(S_* = \lambda_W)$, pa je $(360^\circ - \alpha_*) = \lambda_W - S_\Upsilon$, dok je za istočne geografske dužine $(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\Upsilon$.

▶**PRIMER 24.** Odrediti za 5. jul 2008. godine u UT $= 00^h06^m.3$ na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu u zenitu ako je posmatrač na $\varphi = 45^\circ11'N$, $\lambda = 25^\circ45'.6E$.

a) određivanje S_Υ

5. jul za 00^h S_Υ	$283^\circ21'.3$
Popravka časovnog ugla Prolećne tačke za 06^m18^s	$+\ 1^\circ34'.8$
S_Υ	$284^\circ56'.1$

b) određivanje surektascenzije zvezde pomoću izraza $(360^\circ - \alpha_*) = (360^\circ - \lambda_E) - S_\Upsilon$

	$360^\circ00'.0$
$-\lambda$	$-\ 25^\circ45'.6$
$(360^\circ - \lambda)$	$334^\circ14'.4$
$-S_\Upsilon$	$284^\circ56'.1$
$(360^\circ - \alpha_*)$	$49^\circ18'.3$
	$\cong 49^\circ.3$

Prepoznavanje zvezde u posmatračevom zenitu je jednostavno, jer se tačka u zenitu nalazi na njegovom meridijanu, a deklinacija zvezde jednaka je geografskoj širini posmatrača. Stoga je surektascenzija zvezde oko 49°.3, a njena deklinacija oko 45°11′.0N. Iz pregleda zvezda Godišnjaka ili zvezdane karte vidljivo je da je to zvezda Deneb (α Cyg) sa stvarnom surektascenzijom 49°33′.7 i deklinacijom 45°18′.5. Ostale zvezde koje nisu u zenitu raspoznaju se upoređenjem slike zvezdanog neba sa zvezdanom kartom.

▶**PRIMER 25.** Odrediti za 22. januar 2008. godine u $t_x = 4^h8^m.6$ ($x = +2$) na zvezdanoj karti meridijan posmatrača i prepoznajte zvezdu blizu zenita. Posmatrač se nalazi na $\varphi = 54°50'$N, $\lambda = 47°20'.1$E.

a) određivanje UT

t_x	$4^h08^m.6$
$-x$	$-2^h00^m.0$
UT	$2^h08^m.6$

b) određivanje S_Υ

22. januar u 02^h S_Υ	150°48′.4
Popravka časovnog ugla Prolećne tačke za $08^m.6$	2°09′.4
S_Υ	152°57′.8

c) određivanje surektascenzije zvezde pomoću izraza $(360° - \alpha_*) = (360° - \lambda_E) - S_\Upsilon$

$(360° - \lambda)$	312°39′.9
$-S_\Upsilon$	152°57′.8
$(360° - \alpha_*)$	159°42′.1

Iz zvezdane karte ili pregleda zvezda vidljivo je da je zvezda blizu zenita Mizar (ζ Ursae Majoris) čija je deklinacija 54°52′.6N, a surektascenzija 158°55′.9.

2. Zvezdana karta u Merkatorovoj projekciji na gornjem i donjem rubu ima upisane mesece i dane i time je posmatraču omogućeno da odmah vidi koji je deo zvezdanog neba vidljiv određenog datuma u pola noći. Ako želimo tačno odrediti meridijan posmatrača, moramo odrediti mesni časovni ugao Prolećne tačke (zvezdano mesno vreme) i izračunatu vrednost oduzeti od 360°. Na gornjem rubu karte pronalazimo odgovarajuću surektascenziju i time dobijamo mesto meridijana posmatrača. Zvezde desno od meridijana su prema zapadu, a levo prema istoku od posmatrača, koji je okrenut prema jugu.

▶**PRIMER 26.** Odrediti meridijan posmatrača i prepoznajte zvezdu blizu zenita 14. aprila 2008. godine u $t_x = 23^h17^m.9$ ($x = +2$) na $\varphi = 52°36'$N, $\lambda = 37°55'.6$E.

a) određivanje UT

t_x	$23^h17^m.9$
x	$-\ 2^h00^m.0$
UT	$21^h17^m.9$

b) određivanje s_Υ

14. april za 20^h S_Υ	143°21′.2
Popravka časovnog ugla Prolećne tačke za $1^h17^m53^s$	19°31′.5
$-S_\Upsilon$	162°52′.7
$+\lambda$	$+$ 37°55′.6
s_Υ	200°48′.3
α	200°48′.3
$(360° - s_\Upsilon)$	159°11′.7
$(360° - \alpha)$	159°11′.7

Meridijan posmatrača nalazi se na skali surektascenzije na 159°.2. Pošto je vrednost posmatračeve geografske širine slična vrednosti deklinacije zvezde, zvezda blizu zenita može biti Mizar (ζ UMa), čija je stvarna deklinacija 54°52′.8 i surektascenzija 158°55′.3.

3. Prepoznavanje zvezde u blizini zenita moguće je i pomoću mesnog vremena posmatrača. Zvezdano nebo zvezdane karte prikazano je u pola noći, odnosno kada je $t_s = 00^h$ posmatrača. Znači da je određivanje zenita posmatrača lako, na karti se kao apscisa koristi određeni datum, a ordinata je geografska širina (φ) mesta posmatrača.

Ako se položaj zenita posmatrača određuje u drugo vreme, prvo se određuje zenit u ponoć i zatim se određuje vremenska razlika između $t_s = 0^h$ i mesnog vremena posmatrača, uzima u šestar na satnoj podeli donjeg ruba zvezdane karte i nanosi se od pozicije zenita u pola noći, ulevo ako je traženo vreme posle pola noći ili udesno ako je vreme pre pola noći. Dobijena tačka je pozicija zenita posmatrača.

Na taj način, određeni zenit posmatrača može poslužiti za približnu orijentaciju merenjem zenitne udaljenosti zvezda po levoj ili desnoj stepenskoj podeli deklinacije. Isto tako, može se odrediti približan azimut slično određivanju na pomorskoj karti. U tom slučaju, navigacijski trougao mora se okrenuti jer su E i W strane zvezdane karte suprotno okrenute u odnosu na navigacijsku kartu. Takođe je bitno da su na ovaj način određeni podaci u blizini horizonta posmatrača netačni.

▶**PRIMER 27.** Prepoznajte zvezdu čiji je azimut $A_w = 168°$ i zenitna udaljenost $z = 29°$ dana 11. marta 2008. godine na poziciji $\varphi = 41°20'$N i $\lambda = 17°56'$E u $t_x = 22^h15^m$ ($x = +1$).

a) određivanje t_s

t_x	22^h15^m
$-(x - \lambda)$	$+\ 12^m$
t_s	22^h27^m

b) razlika u odnosu na ponoć

t_{s_1}	0^h00^m
$-t_{s_2}$	22^h27^m
Δt_s (pre ponoći)	1^h33^m

Postupajući na gore opisani način, naći će se pozicija zenita u ponoć, sa koordinatama: $\phi = \delta = 41°.3$N i $(360° - \alpha) = 215°$ (11. mart). Od ove pozicije, približno u smeru 168° i na udaljenosti 29°, pronalazimo zvezdu Regulus (α Leonis).

⋆ ★ ★ ★ ⋆

Zvanična

I

ZONSKA VREMENA

ZVANIČNA I ZONSKA VREMENA

ZONSKO VREME

Podela Zemlje na vremenske zone izvršena je tako da svaka vremenska zona obuhvata područje od 15° geografske dužine. Početna vremenska zona sa zonskim indeksom 0 ($x = 0^h$) proteže se od griničkog meridijana na istok i na zapad do $\lambda = 7°.5\,\mathrm{E}$ i $\lambda = 7°.5\,\mathrm{W}$, a ostale zone nadovezuju se na ove prema istoku, i to sa zonskim indeksima $+1^h$ do $+12^h$, a prema zapadu one sa zonskim indeksima od -1^h do -12^h. Zone sa indeksima $+12^h$ i -12^h predstavljaju u stvari jednu te istu zonu sa indeksom $\pm 12^h$ koja se proteže između $\lambda = 172°.5\,\mathrm{E}$ i $\lambda = 172°.5\,\mathrm{W}$, sa središnjim meridijanom 180° po Griniču.

Za prelaz sa zonskog na griničko vreme koristi se obrazac, gde x označava zonski indeks:

$$\mathrm{UT} = \mathrm{t_x} - \mathrm{x}$$

(O pretvaranju vremena vidi primer u poglavlju 5 Uputstva za upotrebu Nautičkog godišnjaka).

GRANICE DATUMA

Linija na čijem se prelazu vrši promena datuma zove se *datumska granica*. Ona se ne proteže tačno po meridijanu 180°, već zaobilazi nastanjeno kopno i ostrva, pa ide linijom koja se dobije spojnicom sledećih tačaka:

φ	λ	φ	λ
90°.0 N	180°	48°.0 N	180°
75°.0 N	180°	05°.0 S	180°
68°.0 N	168°58′22″ W (ostrva Diomede)	15°.0 S	172°.5 W
65°.5 N	168°58′22″ W (Beringov moreuz)	45°.0 S	172°.5 W
53°.0 N	170° E	51°.0 S	180°
		90°.0 S	180°

Prilikom prelaza granice datuma, ploveći prema zapadu datum se *povećava* za jedan dan. Kada se ona prelazi ploveći prema istoku, *smanjuje* se za jedan dan.

ZVANIČNO VREME I LETNJE VREME

Zvanično vreme, tj. ono vreme koje se unutar granica pojedinih država ili unutar njihovih određenih teritorija koristi u službenom i svakodnevnom životu, najčešće je jednako odgovarajućem zonskom vremenu ili tzv. zimskom vremenu (vidi „Pregled zvaničnih vremena“). Veće zemlje imaju više zvaničnih vremena od kojih svako važi za određene teritorije.

Neke zemlje uvode i *letnje vreme* zbog racionalnog iskorišćenja dnevnog svetla. Ono se obično razlikuje od zonskog (zimskog) vremena za 1^h, a načelno važi na severnoj hemisferi za razdoblje od aprila do oktobra, a na južnoj hemisferi od oktobra do marta. Ipak, neke zemlje ne utvrđuju ni jednake ni fiksne datume prelaska, već ih uvode od slučaja do slučaja na nekoliko dana pre prelaska.

Za prelaz sa *zvaničnog* na *griničko* vreme koristi se obrazac

$$\mathrm{UT} = \mathrm{t_{zv}} - \mathrm{zv},$$

gde zv označava indeks zvaničnog vremena.

HRONOLOŠKI CIKLUSI I ERE

Epakta	22	Julijanski period	6721
Zlatni broj (Mesečev ciklus)	XIV	Sunčev ciklus	1

Era	Godina	Počinje	Era	Godina	Počinje
Vizantijska	7517	14. Sep.	Japanska	2668	1. Jan.
Jevrejska	5769	29. Sep.	Grčka (Seleukidova)	2320	14. Sep.
Kineska (Wu-zi)	(4645)	7. Feb.	Indijska (Saka)	1930	21. Mart
Rimska	2761	14. Jan.	Dioklecijanova	1725	11. Sep.
Nabonasarova	2757	21. Apr.	Islamska (Hegira)	1429	9. Jan.

PREGLED ZVANIČNIH VREMENA

ISTOČNO OD GREENWICH-a [+]

Albanija	1 00
Alžir	1 00
Angola	1 00
Australija:	
Capital Territory	10 00
New South Wales	10 00
Northern Territory	9 30
Queensland	10 00
South Australia	9 30
Tasmania	10 00
Victoria	10 00
Western Australia	8 00
Bahrein	3 00
Balearska ostrva	1 00
Bali	7 00
Bangladeš	6 00
Belgija	1 00
Benin (Dahomej)	1 00
Brunei	8 00
Bugarska	2 00
Burma	6 30
Burundi	2 00
Ceuta	1 00
Čad	1 00
Danska	1 00
Džibuti	3 00
Egipat	2 00
Etiopija	3 00
Fidži	12 00
Filipini	8 00
Finska	2 00
Francuska	1 00
Gabon	1 00
Gibraltar	1 00
Grčka	2 00
Holandija	1 00
Hong Kong	8 00
Indija	5 30
Indonezija:	
Bali, Java, Sumatra	7 00
Borneo, Flores, Timor	8 00
Irian, Molučka ostrva	9 00
Irak	3 00
Iran	3 30
Irska	0 00
Island	0 00
Italija	1 00
Izrael	2 00
Japan	9 00
Jemen	3 00
Jordan	2 00
Jugoslavija	1 00
Južnoafrička Republika	2 00
Kamčatka	12 00
Kamerun	1 00
Kampučija	7 00
Katar	3 00
Kenija	3 00
Kina	8 00
Kipar	2 00
Koreja	9 00
Krit	2 00
Kuvajt	3 00
Laos	7 00
Liban	2 00
Libija	1 00
Madagaskar	3 00
Makao	8 00
Maldivska ostrva	5 00
Malezija	8 00
Malta	1 00
Mandžurija	9 00
Marijanska ostrva	10 00
Mauricijus	4 00
Monako	1 00
Mozambik	2 00
Namibija	2 00
Nemačka	1 00
Nigerija	1 00
Norveška	1 00
Nova Kaledonija	11 00
Novi Zeland	12 00
Oman	4 00
Pakistan	5 00
Papua, Nova Gvineja	10 00
Poljska	1 00
Reunion	4 00
Rumunija	2 00
Rusija (10 zona):	
Novi Port	5 00
Sahalin	11 00
Sankt Petersburg	3 00
Vladivostok	10 00
Volgograd	4 00
Sao Tome i Principe	0 00
Sardinija	1 00
Saudijska Arabija	3 00
Sejšelska ostrva	4 00
Sicilija	1 00
Singapur	8 00
Sirija	2 00
Sokotra	3 00
Somalija	3 00
Sudan	2 00
Španija	1 00
Šri Lanka (Cejlon)	5 30
Švedska	1 00
Tajland	7 00
Tajvan	8 00
Tanzanija	3 00
Tunis	1 00
Turska	3 00
Uganda	3 00
Ujedinjeni Emirati	4 00
Velika Britanija	0 00
Vijetnam	7 00

ZAPADNO OD GREENWICH-a [−]

Argentina	3 00
Azorska ostrva	1 00
Bahamska ostrva	5 00
Barbados	4 00
Belize	6 00
Bermuda	4 00
Bolivija	4 00
Brazil:	
Istočni deo	3 00
Srednji deo	4 00
Zapadni deo	5 00
Čile	4 00
Dominikanska Republika	4 00
Ekvador	5 00
Foklandska ostrva	4 00
Galapagos	6 00
Gambija	0 00
Gana	0 00
Grenada	4 00
Gvajana (Francuska)	3 00
Gvajana (Republika)	3 00
Gvatemala	6 00
Haiti	5 00
Honduras	6 00
Jamajka	5 00
Kajmanska ostrva	5 00
Kanada:	
British Columbia	8 00
Labrador	4 00
New Foundland	3 30
New Scotia	4 00
Yucon	8 00
Kanarska ostrva	0 00
Kapverdska ostrva	1 00
Kolumbija	5 00
Kostarika	6 00
Kuba	5 00
Martinik	4 00
Meksiko	6 00
Midvej	11 00
Nikaragva	6 00
Panamski kanal	5 00
Peru	5 00
Portoriko	4 00
SAD (6 zona):	
Aljaska	9 00
Atlantska obala	5 00
Florida	5 00
Havaji	10 00
Meksički zaliv	6 00
Pacifička obala	8 00
Salvador	6 00
Samoa	11 00
Surinam	3 00
Tobago	4 00
Trinidad	4 00
Urugvaj	3 00
Venecuela	4 00

KARTA ZONSKIH I ZVANIČNIH VREMENA

zone parnih zonskih indeksa
zone neparnih zonskih indeksa
zonski indeks veći - manji za 30 m
zonski indeks između punog i pola sata (bilo koje vreme)
neregulirano ili nepoznato zvanično vreme

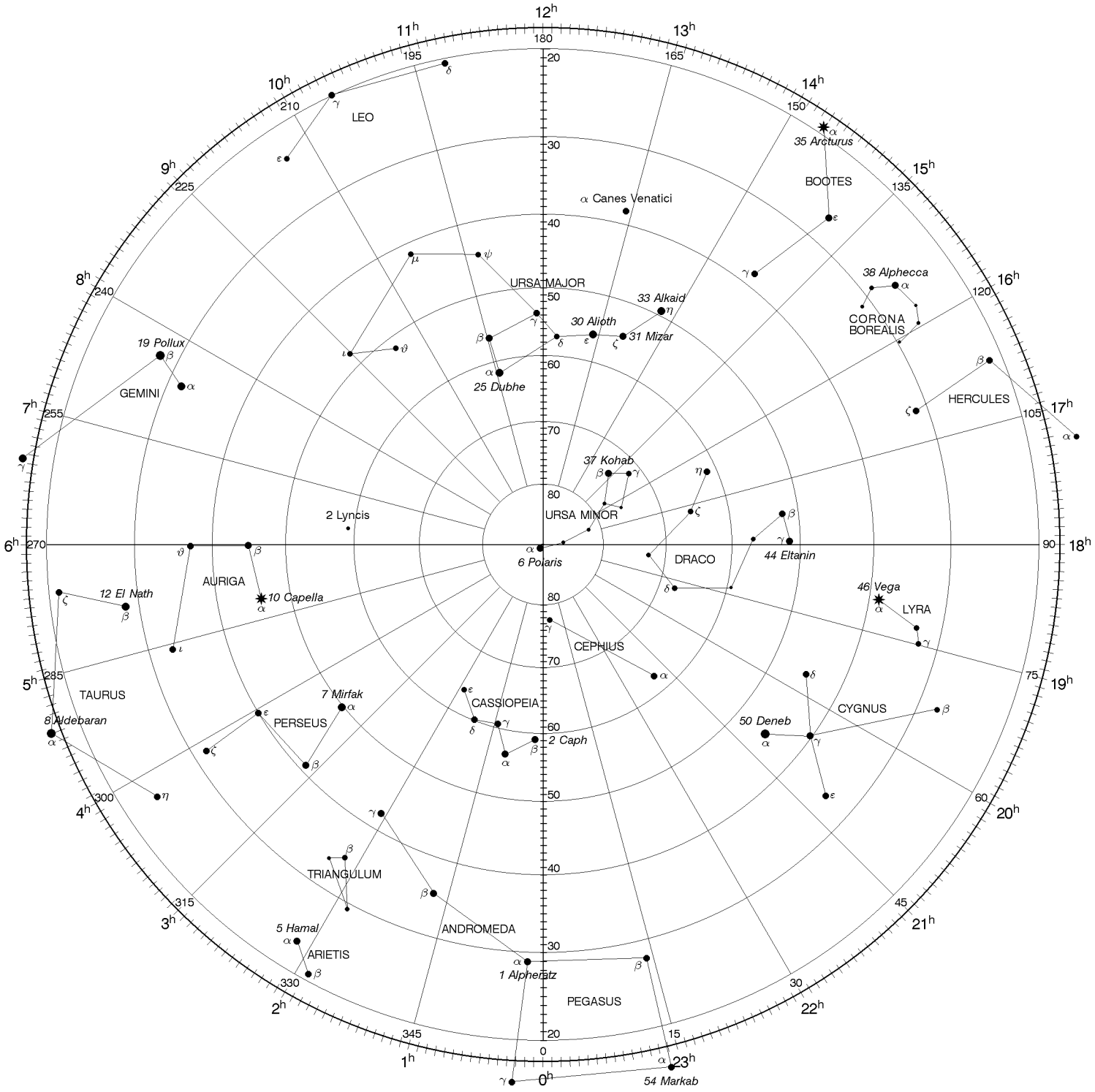
Zapadno od Greenwich-a
0° Greenwich-a
Istočno od Greenwich-a

Hidrografski institut RM Split 1990 - Prilog Nautičkom godišnjaku

Karte

ZVEZDANOG NEBA

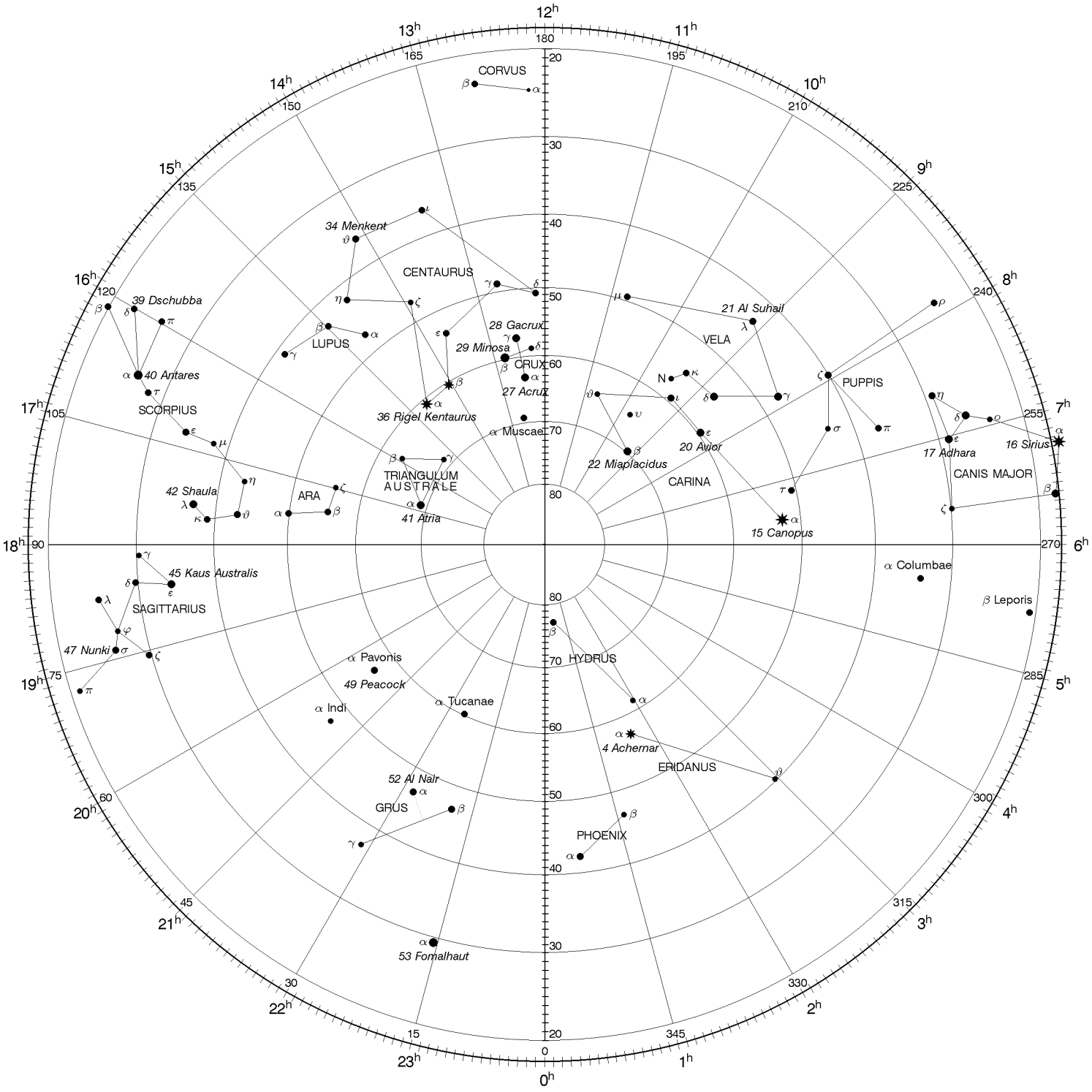
KARTA SAZVEŽĐA SEVERNOG NEBA



VELIČINE ZVEZDA

✷ $0.0 \geq m$	✷ $0.0 < m \leq 0.5$	✷ $0.5 < m \leq 1.0$	● $1.0 < m \leq 1.5$	● $1.5 < m \leq 2.0$	● $2.0 < m \leq 2.5$
● $2.5 < m \leq 3.0$	● $3.0 < m \leq 3.5$	• $3.5 < m \leq 4.0$	• $4.0 < m \leq 4.5$	• $4.5 < m \leq 5.0$	

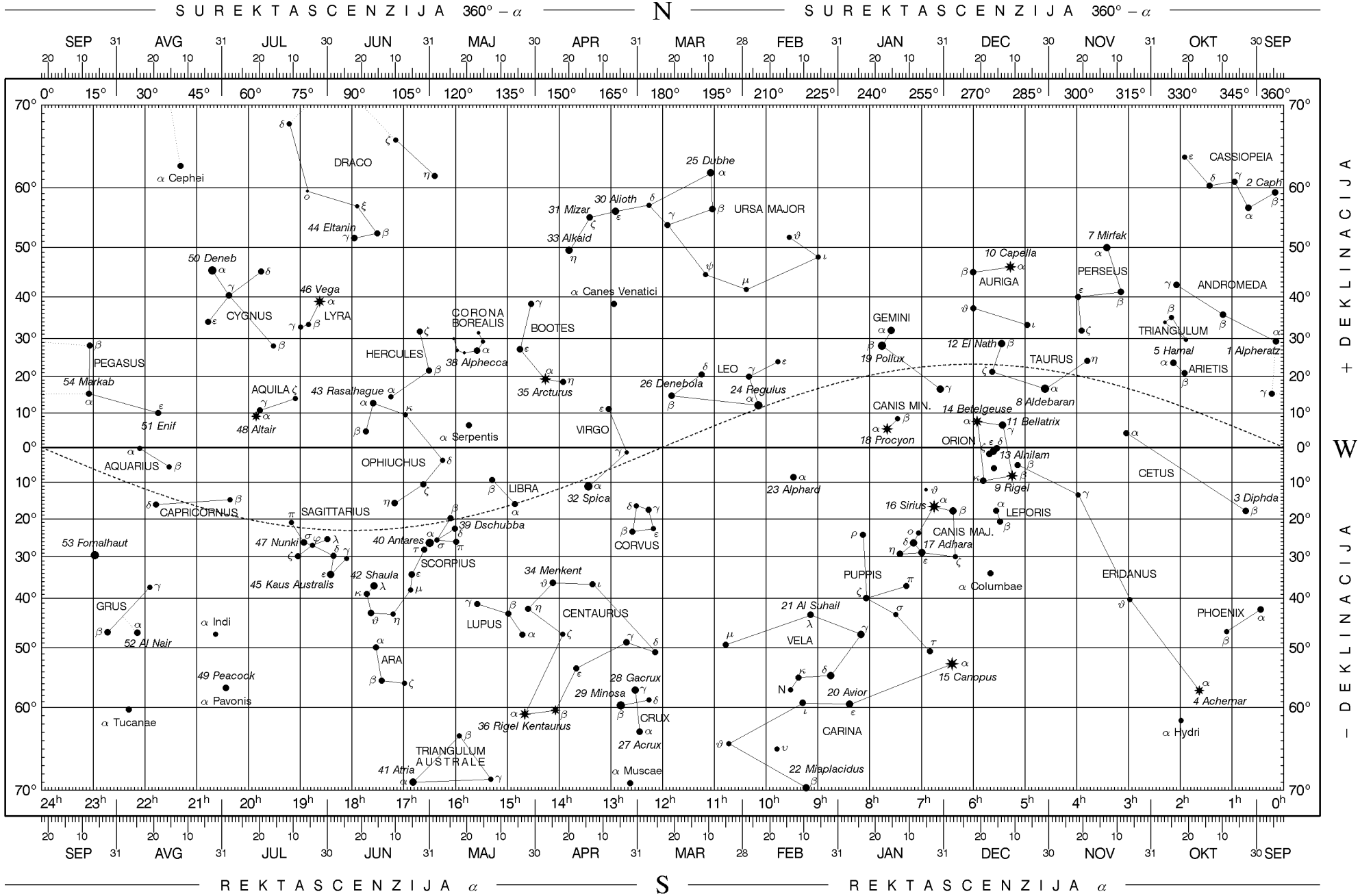
KARTA SAZVEŽĐA JUŽNOG NEBA



VELIČINE ZVEZDA

✷ $0.0 \geq m$	✷ $0.0 < m \leq 0.5$	✷ $0.5 < m \leq 1.0$	● $1.0 < m \leq 1.5$	● $1.5 < m \leq 2.0$	● $2.0 < m \leq 2.5$
● $2.5 < m \leq 3.0$	● $3.0 < m \leq 3.5$	• $3.5 < m \leq 4.0$	• $4.0 < m \leq 4.5$	• $4.5 < m \leq 5.0$	

ZVEZDANO NEBO U POLA NOĆI



✷ 0.0 ≥ m ✷ 0.0 < m ≤ 0.5 ✷ 0.5 < m ≤ 1.0 ● 1.0 < m ≤ 1.5 ● 1.5 < m ≤ 2.0 ● 2.0 < m ≤ 2.5 ● 2.5 < m ≤ 3.0 ● 3.0 < m ≤ 3.5 • 3.5 < m ≤ 4.0 • 4.0 < m ≤ 4.5 • 4.5 < m ≤ 5.0