

UT	ARIES	VENUS -3.9			MARS -0.3			JUPITER -1.9			SATURN +0.2			STARS		
d h	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec		
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	
MONDAY	9 00	257 17.3	216 18.4 N13	48.7	66 47.1 S	4 25.4	143 30.1 N21	58.8	31 04.4 S14	50.9	Acamar	315 18.2 S40	14.8			
	01	272 19.8	231 18.0	49.7	81 49.1	25.7	158 32.1	58.7	46 07.0	50.8	Achernar	335 26.7 S57	09.6			
	02	287 22.2	246 17.6	50.6	96 51.1	26.0	173 34.0	58.6	61 09.6	50.8	Acrux	173 08.2 S63	11.1			
	03	302 24.7	261 17.2	51.5	111 53.0	26.3	188 35.9	58.5	76 12.2	50.8	Adhara	255 12.3 S28	59.8			
	04	317 27.1	276 16.7	52.4	126 55.0	26.6	203 37.8	58.5	91 14.8	50.7	Aldebaran	290 48.9 N16	32.1			
	05	332 29.6	291 16.3	53.3	141 57.0	26.9	218 39.8	58.4	106 17.4	50.7						
	06	347 32.1	306 15.9 N13	54.2	156 58.9 S	4 27.2	233 41.7 N21	58.3	121 20.0 S14	50.7	Alioth	166 20.0 N55	53.1			
	07	2 34.5	321 15.5	55.1	172 00.9	27.5	248 43.6	58.2	136 22.7	50.6	Alkaid	152 58.1 N49	14.7			
	08	17 37.0	336 15.1	56.0	187 02.9	27.8	263 45.5	58.1	151 25.3	50.6	Al Na'ir	27 42.8 S46	53.1			
	09	32 39.5	351 14.6	56.9	202 04.8	28.1	278 47.5	58.1	166 27.9	50.6	Alnilam	275 46.0 S 1	11.8			
	10	47 41.9	6 14.2	57.9	217 06.8	28.3	293 49.4	58.0	181 30.5	50.5	Alphard	217 55.6 S 8	43.5			
	11	62 44.4	21 13.8	58.8	232 08.8	28.6	308 51.3	57.9	196 33.1	50.5						
	12	77 46.9	36 13.4 N13	59.7	247 10.7 S	4 28.9	323 53.2 N21	57.8	211 35.7 S14	50.5	Alphecca	126 10.1 N26	40.1			
	13	92 49.3	51 13.0	60.6	262 12.7	29.2	338 55.1	57.8	226 38.3	50.4	Alpheratz	357 42.8 N29	10.1			
	14	107 51.8	66 12.5	61.5	277 14.6	29.5	353 57.1	57.7	241 40.9	50.4	Altair	62 07.3 N 8	54.5			
	15	122 54.2	81 12.1	62.4	292 16.6	29.8	8 59.0	57.6	256 43.6	50.4	Ankaa	353 15.2 S42	13.4			
	16	137 56.7	96 11.7	63.3	307 18.6	30.1	24 00.9	57.5	271 46.2	50.3	Antares	112 25.0 S26	27.7			
	17	152 59.2	111 11.3	64.2	322 20.5	30.4	39 02.8	57.4	286 48.8	50.3						
	18	168 01.6	126 10.9 N14	65.1	337 22.5 S	4 30.7	54 04.8 N21	57.4	301 51.4 S14	50.3	Arcturus	145 54.9 N19	06.6			
	19	183 04.1	141 10.4	66.0	352 24.4	31.0	69 06.7	57.3	316 54.0	50.2	Atria	107 25.6 S69	03.1			
	20	198 06.6	156 10.0	66.9	7 26.4	31.3	84 08.6	57.2	331 56.6	50.2	Avior	234 18.1 S59	33.7			
	21	213 09.0	171 09.6	67.8	22 28.3	31.6	99 10.5	57.1	346 59.2	50.2	Bellatrix	278 31.6 N 6	21.5			
	22	228 11.5	186 09.2	68.7	37 30.3	31.9	114 12.4	57.0	2 01.8	50.1	Betelgeuse	271 00.9 N 7	24.4			
	23	243 14.0	201 08.7	69.6	52 32.2	32.2	129 14.4	57.0	17 04.5	50.1						
TUESDAY	10 00	258 16.4	216 08.3 N14	10.5	67 34.2 S	4 32.5	144 16.3 N21	56.9	32 07.1 S14	50.1	Canopus	263 56.4 S52	42.5			
	01	273 18.9	231 07.9	11.4	82 36.1	32.8	159 18.2	56.8	47 09.7	50.0	Capella	280 33.9 N46	00.5			
	02	288 21.4	246 07.4	12.3	97 38.1	33.1	174 20.1	56.7	62 12.3	50.0	Deneb	49 30.7 N45	19.9			
	03	303 23.8	261 07.0	13.2	112 40.0	33.4	189 22.1	56.6	77 14.9	50.0	Denebola	182 33.0 N14	29.5			
	04	318 26.3	276 06.6	14.1	127 42.0	33.7	204 24.0	56.6	92 17.5	49.9	Diphda	348 55.4 S17	54.4			
	05	333 28.7	291 06.2	15.0	142 43.9	34.0	219 25.9	56.5	107 20.1	49.9						
	06	348 31.2	306 05.7 N14	15.9	157 45.9 S	4 34.3	234 27.8 N21	56.4	122 22.7 S14	49.9	Dubhe	193 51.1 N61	40.6			
	07	3 33.7	321 05.3	16.8	172 47.8	34.6	249 29.7	56.3	137 25.3	49.8	Elnath	278 12.2 N28	36.9			
	08	18 36.1	336 04.9	17.7	187 49.8	34.9	264 31.7	56.2	152 28.0	49.8	Eltanin	90 45.3 N51	29.4			
	09	33 38.6	351 04.4	18.6	202 51.7	35.2	279 33.6	56.2	167 30.6	49.8	Enif	33 46.3 N 9	56.5			
	10	48 41.1	6 04.0	19.5	217 53.6	35.5	294 35.5	56.1	182 33.2	49.7	Fomalhaut	15 23.2 S29	32.5			
	11	63 43.5	21 03.6	20.4	232 55.6	35.8	309 37.4	56.0	197 35.8	49.7						
	12	78 46.0	36 03.2 N14	21.3	247 57.5 S	4 36.1	324 39.3 N21	55.9	212 38.4 S14	49.7	Gacrux	171 59.8 S57	11.9			
	13	93 48.5	51 02.7	22.2	262 59.5	36.4	339 41.3	55.8	227 41.0	49.6	Gienah	175 51.5 S17	37.5			
	14	108 50.9	66 02.3	23.1	278 01.4	36.7	354 43.2	55.8	242 43.6	49.6	Hadar	148 46.4 S60	26.7			
	15	123 53.4	81 01.9	24.0	293 03.3	37.0	9 45.1	55.7	257 46.2	49.6	Hamal	328 00.2 N23	31.6			
	16	138 55.9	96 01.4	24.9	308 05.3	37.3	24 47.0	55.6	272 48.8	49.5	Kaus Aust.	83 42.5 S34	22.4			
	17	153 58.3	111 01.0	25.8	323 07.2	37.6	39 49.0	55.5	287 51.4	49.5						
	18	169 00.8	126 00.6 N14	26.7	338 09.1 S	4 37.9	54 50.9 N21	55.4	302 54.0 S14	49.5	Kochab	137 19.3 N74	06.0			
	19	184 03.2	141 00.1	27.6	353 11.1	38.2	69 52.8	55.4	317 56.7	49.5	Markab	13 37.6 N15	17.0			
	20	199 05.7	155 59.7	28.5	8 13.0	38.5	84 54.7	55.3	332 59.3	49.4	Menkar	314 14.6 N 4	08.6			
	21	214 08.2	170 59.2	29.3	23 14.9	38.8	99 56.6	55.2	348 01.9	49.4	Menkent	148 06.5 S36	26.6			
	22	229 10.6	185 58.8	30.2	38 16.9	39.2	114 58.6	55.1	3 04.5	49.4	Miaplacidus	221 39.9 S69	47.0			
	23	244 13.1	200 58.4	31.1	53 18.8	39.5	130 00.5	55.0	18 07.1	49.3						
WEDNESDAY	11 00	259 15.6	215 57.9 N14	32.0	68 20.7 S	4 39.8	145 02.4 N21	54.9	33 09.7 S14	49.3	Mirfak	308 39.8 N49	54.5			
	01	274 18.0	230 57.5	32.9	83 22.7	40.1	160 04.3	54.9	48 12.3	49.3	Nunki	75 57.1 S26	16.5			
	02	289 20.5	245 57.1	33.8	98 24.6	40.4	175 06.2	54.8	63 14.9	49.2	Peacock	53 17.8 S56	40.9			
	03	304 23.0	260 56.6	34.7	113 26.5	40.7	190 08.2	54.7	78 17.5	49.2	Pollux	243 27.2 N27	59.3			
	04	319 25.4	275 56.2	35.6	128 28.4	41.0	205 10.1	54.6	93 20.1	49.2	Procyon	244 59.3 N 5	11.1			
	05	334 27.9	290 55.7	36.5	143 30.4	41.3	220 12.0	54.5	108 22.7	49.1						
	06	349 30.4	305 55.3 N14	37.3	158 32.3 S	4 41.6	235 13.9 N21	54.5	123 25.4 S14	49.1	Rasalhague	96 05.5 N12	33.1			
	07	4 32.8	320 54.9	38.2	173 34.2	41.9	250 15.8	54.4	138 28.0	49.1	Regulus	207 42.9 N11	53.7			
	08	19 35.3	335 54.4	39.1	188 36.1	42.2	265 17.7	54.3	153 30.6	49.0	Rigel	281 11.8 S 8	11.3			
	09	34 37.7	350 54.0	40.0	203 38.1	42.5	280 19.7	54.2	168 33.2	49.0	Rigel Kent.	139 50.2 S60	53.8			
	10	49 40.2	5 53.5	40.9	218 40.0	42.8	295 21.6	54.1	183 35.8	49.0	Sabik	102 11.4 S15	44.4			
	11	64 42.7	20 53.1	41.8	233 41.9	43.2	310 23.5	54.1	198 38.4	48.9						
	12	79 45.1	35 52.7 N14	42.6	248 43.8 S	4 43.5	325 25.4 N21	54.0	213 41.0 S14	48.9	Schedar	349 39.8 N56	36.7			
	13	94 47.6	50 52.2	43.5	263 45.7	43.8	340 27.3	53.9	228 43.6	48.9	Shaula	96 20.6 S37	06.6			
	14	109 50.1	65 51.8	44.4	278 47.7	44.1	355 29.3	53.8	243 46.2	48.8	Sirius	258 33.5 S16	44.4			
	15	124 52.5	80 51.3	45.3	293 49.6	44.4	10 31.2	53.7	258 48.8	48.8	Spica	158 30.4 S11	14.2			
	16	139 55.0	95 50.9	46.2	308 51.5	44.7	25 33.1	53.6	273 51.4	48.8	Suhail	222 52.2 S43	29.8			
	17	154 57.5	110 50.4	47.1	323 53.4	45.0	40 35.0	53.6	288 54.0	48.7						
	18	169 59.9	125 50.0 N14	47.9	338 55.3 S	4 45.3	55 36.9 N21	53.5	303 56.6 S14	48.7	Vega	80 38.1 N38	47.9			
	19	185 02.4	140 49.5	48.8	353 57.2	45.6	70 38.9	53.4	318 59.2	48.7	Zuben'ubi	137 04.4 S16	06.1			
	20	200 04.8	155 49.1	49.7	8 59.1	46.0	85 40.8	53.3	334 01.9	48.6						
	21	215 07.3	170 48.7	50.6	24 01.0	46.3	100 42.7	53.2	349 04.5	48.6						
	22	230 09.8	185 48.2	51.4	39 03.0	46.6	115 44.6	53.2	4 07.1	48.6	Venus	317 51.9	9 36			
	23															

UT	SUN		MOON					Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	<i>v</i>	Dec	<i>d</i>	HP		Naut.	Civil		9	10	11	12
									h m	h m		h m	h m	h m	h m
MONDAY	9 00	180 12.9 N22 54.2	54 58.6 11.7 S 9 38.3	9.3	56.8			N 72	□	□	□	17 46	19 50	■	■
	01	195 12.7 54.4	69 29.3 11.7 9 47.6	9.1	56.9			N 70	□	□	□	17 23	19 10	21 00	22 37
	02	210 12.6 54.6	84 00.0 11.6 9 56.7	9.2	56.9			68	□	□	□	17 05	18 43	20 19	21 42
	03	225 12.5 54.8	98 30.6 11.5 10 05.9	9.1	56.9			66	////	////	00 29	16 51	18 22	19 51	21 08
	04	240 12.4 55.0	113 01.1 11.4 10 15.0	9.1	57.0			64	////	////	01 40	16 39	18 06	19 30	20 44
	05	255 12.3 55.2	127 31.5 11.4 10 24.1	9.0	57.0			62	////	////	02 14	16 29	17 52	19 12	20 25
	06	270 12.1 N22 55.4	142 01.9 11.2 S10 33.1	9.0	57.1			60	////	01 03	02 39	16 21	17 40	18 58	20 09
	07	285 12.0 55.6	156 32.1 11.3 10 42.1	8.9	57.1			N 58	////	01 46	02 59	16 13	17 31	18 46	19 56
	08	300 11.9 55.9	171 02.4 11.1 10 51.0	8.9	57.1			56	////	02 14	03 15	16 07	17 22	18 36	19 44
	09	315 11.8 56.1	185 32.5 11.1 10 59.9	8.8	57.2			54	00 57	02 35	03 29	16 01	17 14	18 26	19 34
	10	330 11.7 56.3	200 02.6 11.0 11 08.7	8.9	57.2			52	01 37	02 53	03 41	15 56	17 07	18 18	19 25
	11	345 11.5 56.5	214 32.6 10.9 11 17.6	8.7	57.2			50	02 03	03 07	03 51	15 51	17 01	18 11	19 17
	12	0 11.4 N22 56.7	229 02.5 10.8 S11 26.3	8.7	57.3			45	02 47	03 36	04 13	15 41	16 48	17 55	19 00
	13	15 11.3 56.9	243 32.3 10.8 11 35.0	8.7	57.3			N 40	03 17	03 58	04 31	15 33	16 37	17 42	18 46
	14	30 11.2 57.1	258 02.1 10.6 11 43.7	8.6	57.3			35	03 40	04 16	04 46	15 25	16 28	17 31	18 34
	15	45 11.0 57.3	272 31.7 10.6 11 52.3	8.5	57.4			30	03 58	04 31	04 58	15 19	16 20	17 22	18 24
	16	60 10.9 57.5	287 01.3 10.6 12 00.8	8.6	57.4			20	04 26	04 55	05 20	15 08	16 06	17 05	18 06
	17	75 10.8 57.7	301 30.9 10.4 12 09.4	8.4	57.4			N 10	04 49	05 16	05 39	14 59	15 53	16 51	17 51
	18	90 10.7 N22 57.9	316 00.3 10.4 S12 17.8	8.4	57.5			0	05 07	05 33	05 56	14 50	15 42	16 38	17 36
	19	105 10.5 58.1	330 29.7 10.2 12 26.2	8.3	57.5			S 10	05 24	05 50	06 13	14 41	15 31	16 24	17 22
	20	120 10.4 58.3	344 58.9 10.2 12 34.5	8.3	57.6			20	05 40	06 07	06 31	14 32	15 19	16 10	17 07
	21	135 10.3 58.5	359 28.1 10.2 12 42.8	8.3	57.6			30	05 56	06 26	06 52	14 22	15 05	15 54	16 49
	22	150 10.2 58.7	373 57.3 10.0 12 51.1	8.1	57.6			35	06 04	06 36	07 04	14 15	14 57	15 45	16 39
23	165 10.1 58.9	387 26.3 10.0 12 59.2	8.1	57.7			40	06 13	06 47	07 18	14 09	14 48	15 34	16 27	
							45	06 24	07 01	07 34	14 01	14 38	15 22	16 14	
TUESDAY	10 00	180 09.9 N22 59.1	42 55.3 9.8 S13 07.3	8.1	57.7			S 50	06 35	07 16	07 55	13 51	14 26	15 07	15 57
	01	195 09.8 59.3	57 24.1 9.8 13 15.4	8.0	57.7			52	06 40	07 24	08 04	13 47	14 20	15 00	15 49
	02	210 09.7 59.5	71 52.9 9.8 13 23.4	7.9	57.8			54	06 46	07 32	08 15	13 42	14 13	14 52	15 40
	03	225 09.6 59.7	86 21.7 9.6 13 31.3	7.8	57.8			56	06 52	07 40	08 27	13 37	14 06	14 43	15 31
	04	240 09.4 22 59.9	100 50.3 9.5 13 39.1	7.8	57.8			58	06 58	07 50	08 42	13 31	13 58	14 34	15 20
	05	255 09.3 23 00.1	115 18.8 9.5 13 46.9	7.7	57.9			S 60	07 05	08 02	08 58	13 24	13 49	14 22	15 07
	06	270 09.2 N23 00.2	129 47.3 9.4 S13 54.6	7.7	57.9										
	07	285 09.1 00.4	144 15.7 9.3 14 02.3	7.6	58.0			Lat.	Sunset	Twilight		Moonset			
	08	300 08.9 00.6	158 44.0 9.2 14 09.9	7.5	58.0					Civil	Naut.	9	10	11	12
	09	315 08.8 00.8	173 12.2 9.1 14 17.4	7.4	58.0										
	10	330 08.7 01.0	187 40.3 9.1 14 24.8	7.4	58.1										
	11	345 08.6 01.2	202 08.4 9.0 14 32.2	7.3	58.1										
	12	0 08.4 N23 01.4	216 36.4 8.8 S14 39.5	7.2	58.1			N 72	□	□	□	00 12	(⁰⁰ / ₂₃ ⁰² / ₄₇)	■	■
	13	15 08.3 01.6	231 04.2 8.8 14 46.7	7.2	58.2			N 70	□	□	□	00 27	00 27	00 29	00 36
	14	30 08.2 01.8	245 32.0 8.8 14 53.9	7.0	58.2			68	□	□	□	00 39	00 46	00 57	01 17
	15	45 08.1 01.9	259 59.8 8.6 15 00.9	7.0	58.2			66	23 37	////	////	00 49	01 01	01 18	01 46
	16	60 08.0 02.1	274 27.4 8.5 15 07.9	6.9	58.3			64	22 21	////	////	00 58	01 14	01 35	02 08
	17	75 07.8 02.3	288 54.9 8.5 15 14.8	6.9	58.3			62	21 46	////	////	01 05	01 24	01 50	02 25
	18	90 07.7 N23 02.5	303 22.4 8.4 S15 21.7	6.7	58.4			60	21 20	22 58	////	01 12	01 33	02 02	02 40
	19	105 07.6 02.7	317 49.8 8.3 15 28.4	6.7	58.4			N 58	21 01	22 14	////	01 17	01 41	02 12	02 52
	20	120 07.5 02.9	332 17.1 8.2 15 35.1	6.6	58.4			56	20 44	21 46	////	01 22	01 49	02 21	03 03
	21	135 07.3 03.0	346 44.3 8.2 15 41.7	6.4	58.5			54	20 31	21 24	23 04	01 27	01 55	02 29	03 12
	22	150 07.2 03.2	361 11.5 8.0 15 48.1	6.5	58.5			52	20 19	21 07	22 23	01 31	02 01	02 37	03 21
23	165 07.1 03.4	375 38.5 8.0 15 54.6	6.3	58.5			50	20 08	20 52	21 56	01 34	02 06	02 43	03 28	
							45	19 46	20 23	21 12	01 42	02 17	02 57	03 45	
WEDNESDAY	11 00	180 07.0 N23 03.6	30 05.5 7.9 S16 00.9	6.2	58.6			N 40	19 28	20 01	20 42	01 49	02 26	03 09	03 58
	01	195 06.8 03.8	44 32.4 7.8 16 07.1	6.1	58.6			35	19 13	19 43	20 20	01 55	02 34	03 19	04 09
	02	210 06.7 03.9	58 59.2 7.7 16 13.2	6.1	58.6			30	19 01	19 28	20 01	02 00	02 41	03 28	04 19
	03	225 06.6 04.1	73 25.9 7.7 16 19.3	5.9	58.7			20	18 39	19 04	19 33	02 09	02 54	03 43	04 36
	04	240 06.4 04.3	87 52.6 7.5 16 25.2	5.9	58.7			N 10	18 20	18 43	19 10	02 17	03 04	03 56	04 51
	05	255 06.3 04.5	102 19.1 7.5 16 31.1	5.8	58.7			0	18 03	18 26	18 52	02 24	03 15	04 08	05 05
	06	270 06.2 N23 04.6	116 45.6 7.4 S16 36.9	5.6	58.8			S 10	17 46	18 09	18 35	02 32	03 25	04 21	05 19
	07	285 06.1 04.8	131 12.0 7.4 16 42.5	5.6	58.8			20	17 28	17 52	18 19	02 40	03 35	04 34	05 34
	08	300 05.9 05.0	145 38.4 7.2 16 48.1	5.5	58.8			30	17 07	17 33	18 03	02 49	03 48	04 49	05 51
	09	315 05.8 05.2	160 04.6 7.2 16 53.6	5.3	58.9			35	16 55	17 23	17 54	02 54	03 55	04 58	06 01
	10	330 05.7 05.3	174 30.8 7.1 16 58.9	5.3	58.9			40	16 41	17 11	17 45	03 00	04 03	05 08	06 13
	11	345 05.6 05.5	188 56.9 7.0 17 04.2	5.2	58.9			45	16 24	16 58	17 35	03 07	04 13	05 20	06 26
	12	0 05.4 N23 05.7	203 22.9 7.0 S17 09.4	5.0	59.0			S 50	16 04	16 42	17 24	03 15	04 24	05 34	06 42
	13	15 05.3 05.8	217 48.9 6.8 17 14.4	5.0	59.0			52	15 55	16 35	17 19	03 19	04 30	05 41	06 50
	14	30 05.2 06.0	232 14.7 6.8 17 19.4	4.9	59.0			54	15 44	16 27	17 13	03 23	04 35	05 48	06 58
	15	45 05.1 06.2	246 40.5 6.8 17 24.3	4.7	59.1			56	15 31	16 18	17 07	03 28	04 42	05 57	07 08
	16	60 04.9 06.4	261 06.3 6.6 17 29.0	4.7	59.1			58	15 17	16 08	17 01	03 33	04 50	06 06	07 19
	17	75 04.8 06.5	275 31.9 6.6 17 33.7	4.5	59.1			S 60	15 00	15 57	16 53	03 39	04 58	06 17	07 31
	18	90 04.7 N23 06.7	289 57.5 6.5 S17 38.2	4.4	59.2										
	19	105 04.6 06.9	304 23.0 6.4 17 42.6	4.4	59.2			Day	SUN		MOON				
	20	120 04.4 07.0	318 48.4 6.4 17 47.0	4.2	59.2				Eqn. of Time	Mer.	Mer. Pass.		Age		Phase
	21	135 04.3 07.2	333 13.8 6.3 17 51.2	4.1	59.3				00 ^h	12 ^h	Pass.	Upper			

UT	ARIES			VENUS -3.9			MARS -0.3			JUPITER -1.8			SATURN +0.3			STARS			
	GHA		Dec	GHA		Dec	GHA		Dec	GHA		Dec	GHA		Dec	Name	SHA	Dec	
	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°
12 T H U R S D A Y	00	260	14.7	215	47.3	N14 53.2	69	06.8	S 4 47.2	145	48.4	N21 53.0	34	12.3	S14 48.5	Acamar	315	18.2	S40 14.8
	01	275	17.2	230	46.9	54.1	84	08.7	47.5	160	50.4	52.9	49	14.9	48.5	Achernar	335	26.7	S57 09.6
	02	290	19.6	245	46.4	55.0	99	10.6	47.8	175	52.3	52.8	64	17.5	48.5	Acrux	173	08.2	S63 11.1
	03	305	22.1	260	46.0	55.8	114	12.5	48.2	190	54.2	52.7	79	20.1	48.4	Adhara	255	12.3	S28 59.8
	04	320	24.6	275	45.5	56.7	129	14.4	48.5	205	56.1	52.7	94	22.7	48.4	Aldebaran	290	48.9	N16 32.1
	05	335	27.0	290	45.1	57.6	144	16.3	48.8	220	58.0	52.6	109	25.3	48.4				
	06	350	29.5	305	44.6	N14 58.4	159	18.2	S 4 49.1	235	59.9	N21 52.5	124	27.9	S14 48.3	Alioth	166	20.0	N55 53.1
	07	5	32.0	320	44.2	14 59.3	174	20.1	49.4	251	01.9	52.4	139	30.5	48.3	Alkaid	152	58.2	N49 14.7
	08	20	34.4	335	43.7	15 00.2	189	22.0	49.7	266	03.8	52.3	154	33.1	48.3	Al Na'ir	27	42.8	S46 53.1
	09	35	36.9	350	43.3	01.1	204	23.9	50.1	281	05.7	52.3	169	35.7	48.2	Alnilam	275	46.0	S 1 11.8
	10	50	39.3	5	42.8	01.9	219	25.8	50.4	296	07.6	52.2	184	38.3	48.2	Alphard	217	55.6	S 8 43.5
	11	65	41.8	20	42.4	02.8	234	27.7	50.7	311	09.5	52.1	199	40.9	48.2				
	12	80	44.3	35	41.9	N15 03.7	249	29.6	S 4 51.0	326	11.5	N21 52.0	214	43.5	S14 48.1	Alphecca	126	10.1	N26 40.2
	13	95	46.7	50	41.4	04.5	264	31.5	51.3	341	13.4	51.9	229	46.1	48.1	Alpheratz	357	42.8	N29 10.1
	14	110	49.2	65	41.0	05.4	279	33.4	51.6	356	15.3	51.8	244	48.8	48.1	Altair	62	07.3	N 8 54.6
	15	125	51.7	80	40.5	06.3	294	35.3	52.0	11	17.2	51.8	259	51.4	48.1	Ankaa	353	15.2	S42 13.4
	16	140	54.1	95	40.1	07.2	309	37.2	52.3	26	19.1	51.7	274	54.0	48.0	Antares	112	25.0	S26 27.7
	17	155	56.6	110	39.6	08.0	324	39.1	52.6	41	21.0	51.6	289	56.6	48.0				
	18	170	59.1	125	39.2	N15 08.9	339	41.0	S 4 52.9	56	23.0	N21 51.5	304	59.2	S14 48.0	Arcturus	145	54.9	N19 06.6
	19	186	01.5	140	38.7	09.8	354	42.8	53.2	71	24.9	51.4	320	01.8	47.9	Atria	107	25.6	S69 03.1
	20	201	04.0	155	38.3	10.6	9	44.7	53.6	86	26.8	51.3	335	04.4	47.9	Avior	234	18.2	S59 33.7
	21	216	06.5	170	37.8	11.5	24	46.6	53.9	101	28.7	51.3	350	07.0	47.9	Bellatrix	278	31.6	N 6 21.5
	22	231	08.9	185	37.3	12.3	39	48.5	54.2	116	30.6	51.2	5	09.6	47.8	Betelgeuse	271	00.9	N 7 24.4
23	246	11.4	200	36.9	13.2	54	50.4	54.5	131	32.5	51.1	20	12.2	47.8					
13 F R I D A Y	00	261	13.8	215	36.4	N15 14.1	69	52.3	S 4 54.8	146	34.4	N21 51.0	35	14.8	S14 47.8	Canopus	263	56.4	S52 42.5
	01	276	16.3	230	36.0	14.9	84	54.2	55.2	161	36.4	50.9	50	17.4	47.7	Capella	280	33.9	N46 00.5
	02	291	18.8	245	35.5	15.8	99	56.1	55.5	176	38.3	50.9	65	20.0	47.7	Deneb	49	30.6	N45 19.9
	03	306	21.2	260	35.0	16.7	114	57.9	55.8	191	40.2	50.8	80	22.6	47.7	Denebola	182	33.0	N14 29.5
	04	321	23.7	275	34.6	17.5	129	59.8	56.1	206	42.1	50.7	95	25.2	47.7	Diphda	348	55.3	S17 54.4
	05	336	26.2	290	34.1	18.4	145	01.7	56.5	221	44.0	50.6	110	27.8	47.6				
	06	351	28.6	305	33.7	N15 19.2	160	03.6	S 4 56.8	236	45.9	N21 50.5	125	30.4	S14 47.6	Dubhe	193	51.1	N61 40.6
	07	6	31.1	320	33.2	20.1	175	05.5	57.1	251	47.9	50.4	140	33.0	47.6	Einath	278	12.1	N28 36.9
	08	21	33.6	335	32.7	21.0	190	07.4	57.4	266	49.8	50.4	155	35.6	47.5	Eltanin	90	45.3	N51 29.4
	09	36	36.0	350	32.3	21.8	205	09.2	57.8	281	51.7	50.3	170	38.2	47.5	Enif	33	46.3	N 9 56.6
	10	51	38.5	5	31.8	22.7	220	11.1	58.1	296	53.6	50.2	185	40.8	47.5	Fomalhaut	15	23.2	S29 32.5
	11	66	41.0	20	31.3	23.5	235	13.0	58.4	311	55.5	50.1	200	43.4	47.4				
	12	81	43.4	35	30.9	N15 24.4	250	14.9	S 4 58.7	326	57.4	N21 50.0	215	46.0	S14 47.4	Gacrux	171	59.9	S57 11.9
	13	96	45.9	50	30.4	25.2	265	16.7	59.1	341	59.4	49.9	230	48.6	47.4	Gienah	175	51.5	S17 37.5
	14	111	48.3	65	29.9	26.1	280	18.6	59.4	357	01.3	49.9	245	51.2	47.4	Hadar	148	46.4	S60 26.7
	15	126	50.8	80	29.5	27.0	295	20.5	4 59.7	12	03.2	49.8	260	53.8	47.3	Hamal	328	00.2	N23 31.6
	16	141	53.3	95	29.0	27.8	310	22.4	5 00.0	27	05.1	49.7	275	56.4	47.3	Kaus Aust.	83	42.5	S34 22.4
	17	156	55.7	110	28.5	28.7	325	24.2	00.4	42	07.0	49.6	290	59.0	47.3				
	18	171	58.2	125	28.1	N15 29.5	340	26.1	S 5 00.7	57	08.9	N21 49.5	306	01.6	S14 47.2	Kochab	137	19.3	N74 06.1
	19	187	00.7	140	27.6	30.4	355	28.0	01.0	72	10.8	49.4	321	04.2	47.2	Markab	13	37.6	N15 17.0
	20	202	03.1	155	27.1	31.2	10	29.8	01.3	87	12.8	49.4	336	06.8	47.2	Menkar	314	14.6	N 4 08.6
	21	217	05.6	170	26.7	32.1	25	31.7	01.7	102	14.7	49.3	351	09.4	47.1	Menkent	148	06.5	S36 26.6
	22	232	08.1	185	26.2	32.9	40	33.6	02.0	117	16.6	49.2	6	12.0	47.1	Miaplacidus	221	39.9	S69 47.0
23	247	10.5	200	25.7	33.8	55	35.4	02.3	132	18.5	49.1	21	14.6	47.1					
14 S A T U R D A Y	00	262	13.0	215	25.3	N15 34.6	70	37.3	S 5 02.7	147	20.4	N21 49.0	36	17.2	S14 47.1	Mirfak	308	39.8	N49 54.5
	01	277	15.5	230	24.8	35.5	85	39.2	03.0	162	22.3	48.9	51	19.8	47.0	Nunki	75	57.1	S26 16.5
	02	292	17.9	245	24.3	36.3	100	41.0	03.3	177	24.2	48.8	66	22.4	47.0	Peacock	53	17.8	S56 40.9
	03	307	20.4	260	23.8	37.2	115	42.9	03.6	192	26.2	48.8	81	25.0	47.0	Pollux	243	27.2	N27 59.3
	04	322	22.8	275	23.4	38.0	130	44.8	04.0	207	28.1	48.7	96	27.6	46.9	Procyon	244	59.3	N 5 11.1
	05	337	25.3	290	22.9	38.9	145	46.6	04.3	222	30.0	48.6	111	30.2	46.9				
	06	352	27.8	305	22.4	N15 39.7	160	48.5	S 5 04.6	237	31.9	N21 48.5	126	32.8	S14 46.9	Rasalhague	96	05.5	N12 33.2
	07	7	30.2	320	21.9	40.6	175	50.4	05.0	252	33.8	48.4	141	35.4	46.8	Regulus	207	42.9	N11 53.7
	08	22	32.7	335	21.5	41.4	190	52.2	05.3	267	35.7	48.3	156	38.0	46.8	Rigel	281	11.7	S 8 11.3
	09	37	35.2	350	21.0	42.2	205	54.1	05.6	282	37.6	48.3	171	40.6	46.8	Rigel Kent.	139	50.2	S60 53.8
	10	52	37.6	5	20.5	43.1	220	55.9	06.0	297	39.5	48.2	186	43.2	46.8	Sabik	102	11.4	S15 44.4
	11	67	40.1	20	20.0	43.9	235	57.8	06.3	312	41.5	48.1	201	45.8	46.7				
	12	82	42.6	35	19.6	N15 44.8	250	59.6	S 5 06.6	327	43.4	N21 48.0	216	48.4	S14 46.7	Schedar	349	39.8	N56 36.7
	13	97	45.0	50	19.1	45.6	266	01.5	07.0	342	45.3	47.9	231	51.0	46.7	Shaula	96	20.6	S37 06.6
	14	112	47.5	65	18.6	46.5	281	03.4	07.3	357	47.2	47.8	246	53.6	46.6	Sirius	258	33.5	S16 44.4
	15	127	50.0	80	18.1	47.3	296	05.2	07.6	12	49.1	47.8	261	56.2	46.6	Spica	158	30.4	S11 14.2
	16	142	52.4	95	17.7	48.1	311	07.1	08.0	27	51.0	47.7	276	58.8	46.6	Suhail	222	52.2	S43 29.8
	17	157	54.9	110	17.2	49.0	326	08.9	08.3	42	52.9	47.6	292	01.4	46.6				
	18	172	57.3	125	16.7	N15 49.8	341	10.8	S 5 08.6	57	54.9	N21 47.5	307	04.0	S14 46.5	Vega	80	38.1	N38 48.0
	19	187	59.8	140	16.2	50.7	356	12.6	09.0	72	56.8	47.4	322	06.6	46.5	Zuben'ubi	137	04.4	S16 06.1
	20	203	02.3	155	15.7	51.5	11	14.5	09.3	87	58.7	47.3	337	09.2	46.5				
	21	218	04.7	170	15.3	52.3	26	16.3	09.6	103	00.6	47.2	352	11.8					

UT	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise				
	GHA	Dec	GHA	v	Dec	d		HP	Naut.		Civil	1	2	3	4
d h	° ' "	° ' "	° ' "	' "	° ' "	' "	' "	h m	h m	h m	h m	h m	h m	h m	h m
MONDAY	1 00	179 57.3 N 8 22.9	111 09.9 10.5	S15 20.8	6.0	56.6	N 72	////	02 37	04 06	15 44	█	█	19 29	
	01	194 57.5	22.0	125 39.4 10.4	15 26.8	5.9	56.7	N 70	////	03 04	04 19	14 50	16 24	17 33	18 06
	02	209 57.7	21.1	140 08.8 10.4	15 32.7	5.8	56.7	68	01 39	03 24	04 29	14 18	15 40	16 45	17 27
	03	224 57.9	20.2	154 38.2 10.3	15 38.5	5.7	56.7	66	02 15	03 40	04 38	13 54	15 10	16 14	16 59
	04	239 58.1	19.3	169 07.5 10.3	15 44.2	5.7	56.8	64	02 40	03 52	04 45	13 35	14 48	15 50	16 38
	05	254 58.3	18.4	183 36.8 10.2	15 49.9	5.5	56.8	62	02 59	04 03	04 51	13 20	14 31	15 32	16 21
	06	269 58.5 N 8 17.5	17.5	198 06.0 10.1	S15 55.4	5.5	56.8	60	03 14	04 12	04 57	13 07	14 16	15 17	16 07
	07	284 58.7	16.5	212 35.1 10.1	16 00.9	5.5	56.8	N 58	03 27	04 20	05 02	12 57	14 03	15 04	15 55
	08	299 58.9	15.6	227 04.2 10.0	16 06.4	5.3	56.9	56	03 37	04 27	05 06	12 47	13 53	14 53	15 45
	09	314 59.1	14.7	241 33.2 9.9	16 11.7	5.3	56.9	54	03 46	04 33	05 10	12 39	13 43	14 43	15 35
	10	329 59.3	13.8	256 02.1 9.9	16 17.0	5.1	56.9	52	03 55	04 38	05 13	12 31	13 35	14 34	15 27
	11	344 59.5	12.9	270 31.0 9.8	16 22.1	5.1	57.0	50	04 02	04 43	05 16	12 24	13 27	14 26	15 20
	12	359 59.7 N 8 12.0	12.0	284 59.8 9.7	S16 27.2	5.0	57.0	45	04 16	04 53	05 23	12 10	13 11	14 09	15 04
	13	14 59.9	11.1	299 28.5 9.7	16 32.2	5.0	57.0	N 40	04 28	05 01	05 29	11 58	12 58	13 56	14 51
	14	30 00.1	10.2	313 57.2 9.6	16 37.2	4.8	57.1	35	04 37	05 07	05 33	11 48	12 46	13 44	14 40
	15	45 00.3	09.3	328 25.8 9.5	16 42.0	4.7	57.1	30	04 44	05 13	05 37	11 39	12 37	13 34	14 30
	16	60 00.5	08.4	342 54.3 9.5	16 46.7	4.7	57.1	20	04 56	05 22	05 45	11 24	12 20	13 16	14 13
	17	75 00.7	07.5	357 22.8 9.4	16 51.4	4.6	57.2	N 10	05 05	05 30	05 51	11 11	12 05	13 01	13 58
	18	90 00.9 N 8 06.6	06.6	11 51.2 9.3	S16 56.0	4.5	57.2	0	05 11	05 36	05 56	10 58	11 51	12 47	13 45
	19	105 01.1	05.7	26 19.5 9.3	17 00.5	4.4	57.2	S 10	05 16	05 41	06 02	10 46	11 38	12 33	13 31
	20	120 01.3	04.7	40 47.8 9.2	17 04.9	4.3	57.3	20	05 20	05 46	06 08	10 33	11 23	12 18	13 16
	21	135 01.5	03.8	55 16.0 9.2	17 09.2	4.2	57.3	30	05 23	05 50	06 14	10 18	11 07	12 01	13 00
	22	150 01.7	02.9	69 44.2 9.0	17 13.4	4.1	57.3	35	05 23	05 53	06 18	10 10	10 57	11 50	12 50
23	165 01.9	02.0	84 12.2 9.1	17 17.5	4.0	57.4	40	05 24	05 55	06 22	10 00	10 46	11 39	12 39	
2	180 02.1 N 8 01.1	01.1	98 40.3 8.9	S17 21.5	4.0	57.4	45	05 24	05 58	06 27	09 48	10 33	11 25	12 26	
01	195 02.3	00.2	113 08.2 8.9	17 25.5	3.8	57.4	S 50	05 23	06 00	06 33	09 35	10 18	11 09	12 10	
02	210 02.5	7 59.3	127 36.1 8.8	17 29.3	3.7	57.5	52	05 22	06 01	06 35	09 28	10 10	11 01	12 02	
03	225 02.7	58.4	142 03.9 8.8	17 33.0	3.7	57.5	54	05 22	06 03	06 38	09 21	10 02	10 53	11 54	
04	240 02.9	57.5	156 31.7 8.7	17 36.7	3.5	57.5	56	05 21	06 04	06 41	09 13	09 53	10 43	11 45	
05	255 03.1	56.6	170 59.4 8.6	17 40.2	3.5	57.6	58	05 20	06 05	06 45	09 04	09 43	10 32	11 34	
06	270 03.3 N 7 55.6	55.6	185 27.0 8.6	S17 43.7	3.3	57.6	S 60	05 19	06 07	06 49	08 54	09 31	10 20	11 22	
07	285 03.5	54.7	199 54.6 8.5	17 47.0	3.3	57.6	Lat.	Sunset	Twilight		Moonset				
08	300 03.7	53.8	214 22.1 8.5	17 50.3	3.1	57.7			Civil	Naut.	1	2	3	4	
09	315 03.9	52.9	228 49.6 8.4	17 53.4	3.1	57.7	Lat.	h m	h m	h m	h m	h m	h m	h m	
10	330 04.1	52.0	243 17.0 8.3	17 56.5	2.9	57.7	N 72	19 50	21 16	////	18 29	█	█	20 35	
11	345 04.3	51.1	257 44.3 8.3	17 59.4	2.9	57.8	N 70	19 38	20 51	23 17	19 23	19 41	20 29	21 58	
12	0 04.5 N 7 50.2	50.2	272 11.6 8.2	S18 02.3	2.7	57.8	68	19 28	20 32	22 13	19 57	20 26	21 18	22 36	
13	15 04.7	49.3	286 38.8 8.1	18 05.0	2.7	57.8	66	19 19	20 17	21 40	20 51	20 56	21 49	23 03	
14	30 04.9	48.3	301 05.9 8.1	18 07.7	2.5	57.9	64	19 12	20 04	21 16	20 40	21 18	22 12	23 24	
15	45 05.1	47.4	315 33.0 8.1	18 10.2	2.4	57.9	62	19 06	19 54	20 58	20 55	21 36	22 30	23 41	
16	60 05.3	46.5	330 00.1 7.9	18 12.6	2.4	57.9	60	19 01	19 45	20 43	21 09	21 51	22 46	23 54	
17	75 05.5	45.6	344 27.0 7.9	18 15.0	2.2	58.0	N 58	18 56	19 38	20 31	21 20	22 03	22 59	24 06	
18	90 05.7 N 7 44.7	44.7	358 53.9 7.9	S18 17.2	2.1	58.0	56	18 52	19 31	20 20	21 30	22 14	23 10	24 17	
19	105 05.9	43.8	13 20.8 7.8	18 19.3	2.0	58.0	54	18 49	19 26	20 11	21 38	22 24	23 19	24 26	
20	120 06.1	42.9	27 47.6 7.8	18 21.3	1.9	58.1	52	18 45	19 20	20 03	21 46	22 32	23 28	24 34	
21	135 06.3	41.9	42 14.4 7.6	18 23.2	1.8	58.1	50	18 42	19 16	19 56	21 53	22 40	23 36	24 41	
22	150 06.5	41.0	56 41.0 7.7	18 25.0	1.7	58.1	45	18 36	19 06	19 42	22 08	22 57	23 53	24 56	
23	165 06.7	40.1	71 07.7 7.6	18 26.7	1.5	58.2	N 40	18 30	18 58	19 31	22 21	23 10	24 06	00 06	
3 00	180 06.9 N 7 39.2	39.2	85 34.3 7.5	S18 28.2	1.5	58.2	35	18 26	18 51	19 22	22 31	23 22	24 18	00 18	
01	195 07.1	38.3	100 00.8 7.4	18 29.7	1.3	58.2	30	18 22	18 46	19 14	22 41	23 32	24 28	00 28	
02	210 07.3	37.4	114 27.2 7.5	18 31.0	1.3	58.3	20	18 15	18 37	19 03	22 56	23 49	24 45	00 45	
03	225 07.5	36.5	128 53.7 7.3	18 32.3	1.1	58.3	N 10	18 09	18 30	18 54	23 10	24 04	00 04	01 00	
04	240 07.7	35.5	143 20.0 7.3	18 33.4	1.0	58.3	0	18 03	18 24	18 48	23 23	24 18	00 18	01 14	
05	255 07.9	34.6	157 46.3 7.3	18 34.4	0.9	58.4	S 10	17 58	18 19	18 43	23 37	24 32	00 32	01 28	
06	270 08.1 N 7 33.7	33.7	172 12.6 7.2	S18 35.3	0.8	58.4	20	17 52	18 14	18 40	23 51	24 47	00 47	01 43	
07	285 08.3	32.8	186 38.8 7.2	18 36.1	0.6	58.5	30	17 46	18 10	18 37	24 07	00 07	01 04	02 01	
08	300 08.5	31.9	201 05.0 7.1	18 36.7	0.6	58.5	35	17 42	18 07	18 37	24 16	00 16	01 14	02 10	
09	315 08.7	31.0	215 31.1 7.1	18 37.3	0.4	58.5	40	17 38	18 05	18 36	24 26	00 26	01 25	02 22	
10	330 08.9	30.0	229 57.2 7.0	18 37.7	0.3	58.6	45	17 33	18 03	18 37	24 39	00 39	01 39	02 35	
11	345 09.1	29.1	244 23.2 7.0	18 38.0	0.2	58.6	S 50	17 28	18 00	18 38	24 54	00 54	01 55	02 51	
12	0 09.3 N 7 28.2	28.2	258 49.2 6.9	S18 38.2	0.1	58.6	52	17 25	17 59	18 38	25 01	01 01	02 03	02 59	
13	15 09.5	27.3	273 15.1 6.9	18 38.3	0.0	58.7	54	17 22	17 58	18 39	00 03	01 09	02 11	03 07	
14	30 09.7	26.4	287 41.0 6.8	18 38.3	0.2	58.7	56	17 19	17 57	18 40	00 11	01 18	02 21	03 17	
15	45 09.9	25.5	302 06.8 6.8	18 38.1	0.2	58.7	58	17 16	17 55	18 41	00 19	01 28	02 32	03 28	
16	60 10.2	24.5	316 32.6 6.7	18 37.9	0.4	58.8	S 60	17 12	17 54	18 42	00 29	01 40	02 44	03 40	
17	75 10.4	23.6	330 58.3 6.8	18 37.5	0.5	58.8	Day	SUN		MOON					
18	90 10.6 N 7 22.7	22.7	345 24.1 6.6	S18 37.0	0.7	58.8		Eqn. of Time	Mer.	Mer. Pass.		Age		Phase	
19	105 10.8	21.8	359 49.7 6.7	18 36.3	0.7	58.9		00 ^h	12 ^h	Pass.	Upper	Lower	d	%	
20	120 11.0	20.9	14 15.4 6.5	18 35.6	0.9	58.9	1	00 11	00 02	12 00	17 11	04 45	07 40		
21	135 11.2	19.9	28 40.9 6.6	18 34.7											

UT	ARIES			VENUS -3.9			MARS +0.8			JUPITER -1.9			SATURN +0.6			STARS		
d h	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	Name	SHA	Dec		
TUESDAY	7 00	15 33.9	186 51.0 S 2	15.6	121 02.2 S24	11.7	236 00.4 N16	16.7	146 20.4 S16	07.3	70 07.3	146 20.4	07.3	Acamar	315 17.3	S40 14.6		
	01	30 36.4	201 50.6	16.9	136 02.7	11.9	251 02.5	16.6	161 22.6	07.4	71 07.4	161 22.6	07.4	Achernar	335 25.6	S57 09.7		
	02	45 38.8	216 50.2	18.2	151 03.2	12.1	266 04.5	16.4	176 24.8	07.5	72 07.5	176 24.8	07.5	Acrux	173 08.8	S63 10.8		
	03	60 41.3	231 49.8	19.4	166 03.8	12.3	281 06.6	16.3	191 27.0	07.5	73 07.5	191 27.0	07.5	Adhara	255 11.8	S28 59.5		
	04	75 43.8	246 49.4	20.7	181 04.3	12.4	296 08.6	16.2	206 29.2	07.6	74 07.6	206 29.2	07.6	Aldebaran	290 48.2	N16 32.2		
	05	90 46.2	261 49.0	21.9	196 04.8	12.6	311 10.7	16.1	221 31.4	07.7	75 07.7	221 31.4	07.7					
	06	105 48.7	276 48.6 S 2	23.2	211 05.4 S24	12.8	326 12.7 N16	16.0	236 33.6 S16	07.8	76 07.8	236 33.6	07.8	Alioth	166 20.6	N55 52.8		
	07	120 51.2	291 48.2	24.4	226 05.9	13.0	341 14.8	15.9	251 35.8	07.8	77 07.8	251 35.8	07.8	Alkaid	152 58.7	N49 14.6		
	08	135 53.6	306 47.8	25.7	241 06.4	13.2	356 16.9	15.7	266 38.0	07.9	78 07.9	266 38.0	07.9	Al Na'ir	27 42.4	S46 53.3		
	09	150 56.1	321 47.4	26.9	256 06.9	13.4	11 18.9	15.6	281 40.2	08.0	79 08.0	281 40.2	08.0	Alnilam	275 45.3	S 1 11.6		
	10	165 58.6	336 47.0	28.2	271 07.5	13.6	26 21.0	15.5	296 42.5	08.1	80 08.1	296 42.5	08.1	Alphard	217 55.4	S 8 43.3		
	11	181 01.0	351 46.6	29.4	286 08.0	13.8	41 23.0	15.4	311 44.7	08.1	81 08.1	311 44.7	08.1					
	12	196 03.5	6 46.2 S 2	30.7	301 08.5 S24	14.0	56 25.1 N16	15.3	326 46.9 S16	08.2	82 08.2	326 46.9	08.2	Alphecca	126 10.6	N26 40.2		
	13	211 06.0	21 45.8	31.9	316 09.1	14.2	71 27.2	15.2	341 49.1	08.3	83 08.3	341 49.1	08.3	Alpheratz	357 42.2	N29 10.5		
	14	226 08.4	36 45.4	33.2	331 09.6	14.3	86 29.2	15.0	356 51.3	08.3	84 08.3	356 51.3	08.3	Altair	62 07.3	N 8 54.8		
	15	241 10.9	51 45.0	34.4	346 10.1	14.5	101 31.3	14.9	11 53.5	08.4	85 08.4	11 53.5	08.4	Ankaa	353 14.5	S42 13.5		
	16	256 13.3	66 44.6	35.7	1 10.6	14.7	116 33.3	14.8	26 55.7	08.5	86 08.5	26 55.7	08.5	Antares	112 25.4	S26 27.7		
	17	271 15.8	81 44.2	36.9	16 11.2	14.9	131 35.4	14.7	41 57.9	08.6	87 08.6	41 57.9	08.6					
	18	286 18.3	96 43.8 S 2	38.2	31 11.7 S24	15.1	146 37.5 N16	14.6	57 00.1 S16	08.6	88 08.6	57 00.1	08.6	Arcturus	145 55.3	N19 06.6		
	19	301 20.7	111 43.4	39.4	46 12.2	15.3	161 39.5	14.5	72 02.3	08.7	89 08.7	72 02.3	08.7	Atria	107 26.6	S69 03.2		
	20	316 23.2	126 43.0	40.7	61 12.7	15.5	176 41.6	14.3	87 04.5	08.8	90 08.8	87 04.5	08.8	Avior	234 17.8	S59 33.2		
	21	331 25.7	141 42.6	41.9	76 13.3	15.6	191 43.6	14.2	102 06.7	08.9	91 08.9	102 06.7	08.9	Bellatrix	278 30.9	N 6 21.7		
	22	346 28.1	156 42.2	43.2	91 13.8	15.8	206 45.7	14.1	117 08.9	08.9	92 08.9	117 08.9	08.9	Betelgeuse	271 00.2	N 7 24.5		
23	1 30.6	171 41.8	44.4	106 14.3	16.0	221 47.8	14.0	132 11.1	09.0		132 11.1	09.0						
WEDNESDAY	8 00	16 33.1	186 41.4 S 2	45.7	121 14.8 S24	16.2	236 49.8 N16	13.9	147 13.3 S16	09.1	70 09.1	147 13.3	09.1	Canopus	263 55.6	S52 42.1		
	01	31 35.5	201 41.0	47.0	136 15.4	16.4	251 51.9	13.8	162 15.6	09.1	71 09.1	162 15.6	09.1	Capella	280 32.9	N46 00.5		
	02	46 38.0	216 40.6	48.2	151 15.9	16.6	266 53.9	13.6	177 17.8	09.2	72 09.2	177 17.8	09.2	Deneb	49 30.6	N45 20.4		
	03	61 40.5	231 40.2	49.5	166 16.4	16.7	281 56.0	13.5	192 20.0	09.3	73 09.3	192 20.0	09.3	Denebola	182 33.1	N14 29.4		
	04	76 42.9	246 39.8	50.7	181 16.9	16.9	296 58.1	13.4	207 22.2	09.4	74 09.4	207 22.2	09.4	Diphda	348 54.7	S17 54.2		
	05	91 45.4	261 39.4	52.0	196 17.5	17.1	312 00.1	13.3	222 24.4	09.4	75 09.4	222 24.4	09.4					
	06	106 47.8	276 39.0 S 2	53.2	211 18.0 S24	17.3	327 02.2 N16	13.2	237 26.6 S16	09.5	76 09.5	237 26.6	09.5	Dubhe	193 51.3	N61 40.1		
	07	121 50.3	291 38.6	54.5	226 18.5	17.5	342 04.2	13.1	252 28.8	09.6	77 09.6	252 28.8	09.6	El Nath	278 11.3	N28 37.0		
	08	136 52.8	306 38.2	55.7	241 19.0	17.6	357 06.3	12.9	267 31.0	09.7	78 09.7	267 31.0	09.7	Eltanin	90 45.9	N51 29.7		
	09	151 55.2	321 37.8	57.0	256 19.6	17.8	12 08.4	12.8	282 33.2	09.7	79 09.7	282 33.2	09.7	Enif	33 46.0	N 9 56.9		
	10	166 57.7	336 37.4	58.2	271 20.1	18.0	27 10.4	12.7	297 35.4	09.8	80 09.8	297 35.4	09.8	Fomalhaut	15 22.7	S29 32.5		
	11	182 00.2	351 37.0	59.5	286 20.6	18.2	42 12.5	12.6	312 37.6	09.9	81 09.9	312 37.6	09.9					
	12	197 02.6	6 36.6 S 3	00.7	301 21.1 S24	18.4	57 14.6 N16	12.5	327 39.8 S16	09.9	82 09.9	327 39.8	09.9	Gacrux	172 00.4	S57 11.6		
	13	212 05.1	21 36.2	02.0	316 21.6	18.5	72 16.6	12.4	342 42.0	10.0	83 10.0	342 42.0	10.0	Gienah	175 51.7	S17 37.3		
	14	227 07.6	36 35.8	03.2	331 22.2	18.7	87 18.7	12.3	357 44.2	10.1	84 10.1	357 44.2	10.1	Hadar	148 47.1	S60 26.6		
	15	242 10.0	51 35.4	04.5	346 22.7	18.9	102 20.7	12.1	12 46.4	10.2	85 10.2	12 46.4	10.2	Hamal	327 59.4	N23 31.9		
	16	257 12.5	66 35.0	05.7	1 23.2	19.1	117 22.8	12.0	27 48.6	10.2	86 10.2	27 48.6	10.2	Kaus Aust.	83 42.7	S34 22.5		
	17	272 14.9	81 34.6	07.0	16 23.7	19.3	132 24.9	11.9	42 50.8	10.3	87 10.3	42 50.8	10.3					
	18	287 17.4	96 34.2 S 3	08.2	31 24.2 S24	19.4	147 26.9 N16	11.8	57 53.0 S16	10.4	88 10.4	57 53.0	10.4	Kochab	137 21.2	N74 05.9		
	19	302 19.9	111 33.8	09.5	46 24.8	19.6	162 29.0	11.7	72 55.3	10.5	89 10.5	72 55.3	10.5	Markab	13 37.1	N15 17.3		
	20	317 22.3	126 33.4	10.7	61 25.3	19.8	177 31.1	11.6	87 57.5	10.5	90 10.5	87 57.5	10.5	Menkar	314 13.8	N 4 08.9		
	21	332 24.8	141 33.0	12.0	76 25.8	20.0	192 33.1	11.4	102 59.7	10.6	91 10.6	102 59.7	10.6	Menkent	148 06.9	S36 26.4		
	22	347 27.3	156 32.6	13.2	91 26.3	20.1	207 35.2	11.3	118 01.9	10.7	92 10.7	118 01.9	10.7	Miaplacidus	221 39.8	S69 46.5		
23	2 29.7	171 32.2	14.5	106 26.8	20.3	222 37.3	11.2	133 04.1	10.7		133 04.1	10.7						
THURSDAY	9 00	17 32.2	186 31.8 S 3	15.7	121 27.3 S24	20.5	237 39.3 N16	11.1	148 06.3 S16	10.8	70 10.8	148 06.3	10.8	Mirfak	308 38.6	N49 54.6		
	01	32 34.7	201 31.4	17.0	136 27.9	20.7	252 41.4	11.0	163 08.5	10.9	71 10.9	163 08.5	10.9	Nunki	75 57.2	S26 16.5		
	02	47 37.1	216 31.0	18.2	151 28.4	20.8	267 43.5	10.9	178 10.7	11.0	72 11.0	178 10.7	11.0	Peacock	53 17.7	S56 41.2		
	03	62 39.6	231 30.6	19.5	166 28.9	21.0	282 45.5	10.8	193 12.9	11.0	73 11.0	193 12.9	11.0	Pollux	243 26.7	N27 59.2		
	04	77 42.1	246 30.2	20.7	181 29.4	21.2	297 47.6	10.6	208 15.1	11.1	74 11.1	208 15.1	11.1	Procyon	244 58.9	N 5 11.1		
	05	92 44.5	261 29.8	22.0	196 29.9	21.3	312 49.7	10.5	223 17.3	11.2	75 11.2	223 17.3	11.2					
	06	107 47.0	276 29.4 S 3	23.2	211 30.5 S24	21.5	327 51.7 N16	10.4	238 19.5 S16	11.3	76 11.3	238 19.5	11.3	Rasalhague	96 05.8	N12 33.3		
	07	122 49.4	291 29.0	24.5	226 31.0	21.7	342 53.8	10.3	253 21.7	11.3	77 11.3	253 21.7	11.3	Regulus	207 42.8	N11 53.7		
	08	137 51.9	306 28.6	25.7	241 31.5	21.9	357 55.9	10.2	268 23.9	11.4	78 11.4	268 23.9	11.4	Rigel	281 11.1	S 8 11.1		
	09	152 54.4	321 28.2	27.0	256 32.0	22.0	12 57.9	10.1	283 26.1	11.5	79 11.5	283 26.1	11.5	Rigel Kent.	139 51.0	S60 53.7		
	10	167 56.8	336 27.8	28.2	271 32.5	22.2	28 00.0	10.0	298 28.3	11.5	80 11.5	298 28.3	11.5	Sabik	102 11.7	S15 44.3		
	11	182 59.3	351 27.4	29.5	286 33.0	22.4	43 02.1	09.8	313 30.5	11.6	81 11.6	313 30.5	11.6					
	12	198 01.8	6 27.0 S 3	30.7	301 33.5 S24	22.5	58 04.1 N16	09.7	328 32.7 S16	11.7	82 11.7	328 32.7	11.7	Schedar	349 38.8	N56 37.2		
	13	213 04.2	21 26.6	32.0	316 34.1	22.7	73 06.2	09.6	343 34.9	11.8	83 11.8	343						

UT	SUN		MOON				Lat.	Twilight		Sunrise	Moonrise			
	GHA	Dec	GHA	<i>v</i>	Dec	<i>d</i>		HP	Naut.		Civil	7	8	9
d h	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	h m	h m	h m	h m	h m	h m
TUESDAY	7 00	183 00.2 S 5 23.2	22 10.4 8.4 S 0 22.5 11.7 60.4	N 72	04 23	05 42	06 50	16 34	16 28	16 22	16 16			
	01	198 00.4 24.1	36 37.8 8.4 S 0 10.8 11.8 60.4	N 70	04 31	05 42	06 43	16 38	16 39	16 41	16 45			
	02	213 00.6 25.1	51 05.2 8.3 N 0 01.0 11.7 60.4	68	04 37	05 42	06 37	16 41	16 47	16 55	17 07			
	03	228 00.7 26.1	65 32.5 8.4 0 12.7 11.8 60.4	66	04 42	05 41	06 33	16 43	16 54	17 07	17 24			
	04	243 00.9 27.0	79 59.9 8.4 0 24.5 11.7 60.4	64	04 46	05 41	06 29	16 45	17 00	17 17	17 38			
	05	258 01.1 28.0	94 27.3 8.3 0 36.2 11.8 60.4	62	04 49	05 41	06 25	16 47	17 05	17 25	17 50			
	06	273 01.3 S 5 28.9	108 54.6 8.4 N 0 48.0 11.7 60.4	60	04 52	05 40	06 22	16 49	17 10	17 33	18 00			
	07	288 01.5 29.9	123 22.0 8.4 0 59.7 11.7 60.4	N 58	04 54	05 40	06 19	16 51	17 14	17 39	18 09			
	08	303 01.7 30.8	137 49.4 8.4 1 11.4 11.8 60.4	56	04 56	05 39	06 17	16 52	17 17	17 45	18 17			
	09	318 01.8 31.8	152 16.8 8.4 1 23.2 11.7 60.4	54	04 58	05 39	06 14	16 53	17 21	17 50	18 24			
	10	333 02.0 32.7	166 44.2 8.4 1 34.9 11.6 60.4	52	05 00	05 39	06 12	16 54	17 24	17 55	18 30			
	11	348 02.2 33.7	181 11.6 8.4 1 46.5 11.7 60.4	50	05 01	05 38	06 11	16 55	17 26	17 59	18 36			
	12	3 02.4 S 5 34.7	195 39.0 8.5 N 1 58.2 11.7 60.3	45	05 03	05 37	06 06	16 57	17 32	18 09	18 48			
	13	18 02.6 35.6	210 06.5 8.4 2 09.9 11.6 60.3	N 40	05 05	05 36	06 03	16 59	17 37	18 17	18 58			
	14	33 02.7 36.6	224 33.9 8.4 2 21.5 11.6 60.3	35	05 05	05 35	06 00	17 01	17 41	18 23	19 07			
	15	48 02.9 37.5	239 01.3 8.4 2 33.1 11.6 60.3	30	05 06	05 33	05 57	17 02	17 45	18 29	19 15			
	16	63 03.1 38.5	253 28.7 8.5 2 44.7 11.6 60.3	20	05 05	05 31	05 53	17 05	17 52	18 40	19 28			
	17	78 03.3 39.4	267 56.2 8.4 2 56.3 11.6 60.3	N 10	05 03	05 27	05 48	17 07	17 58	18 49	19 40			
	18	93 03.5 S 5 40.4	282 23.6 8.4 N 3 07.9 11.5 60.3	0	04 59	05 24	05 44	17 09	18 03	18 57	19 51			
	19	108 03.6 41.3	296 51.0 8.5 3 19.4 11.5 60.2	S 10	04 54	05 19	05 40	17 11	18 09	19 06	20 02			
	20	123 03.8 42.3	311 18.5 8.4 3 30.9 11.5 60.2	20	04 47	05 13	05 36	17 14	18 15	19 15	20 14			
	21	138 04.0 43.2	325 45.9 8.4 3 42.4 11.4 60.2	30	04 38	05 06	05 30	17 17	18 22	19 26	20 28			
	22	153 04.2 44.2	340 13.3 8.5 3 53.8 11.4 60.2	35	04 31	05 01	05 27	17 18	18 26	19 32	20 36			
23	168 04.3 45.2	354 40.8 8.4 4 05.2 11.4 60.2	40	04 24	04 56	05 24	17 20	18 30	19 39	20 45				
			45	04 14	04 50	05 19	17 22	18 36	19 47	20 56				
WEDNESDAY	8 00	183 04.5 S 5 46.1	9 08.2 8.5 N 4 16.6 11.4 60.2	S 50	04 01	04 41	05 14	17 25	18 42	19 57	21 09			
	01	198 04.7 47.1	23 35.7 8.4 4 28.0 11.3 60.2	52	03 55	04 37	05 12	17 26	18 45	20 02	21 15			
	02	213 04.9 48.0	38 03.1 8.5 4 39.3 11.3 60.1	54	03 49	04 33	05 09	17 27	18 48	20 07	21 22			
	03	228 05.1 49.0	52 30.6 8.4 4 50.6 11.2 60.1	56	03 41	04 28	05 07	17 28	18 52	20 13	21 29			
	04	243 05.2 49.9	66 58.0 8.5 5 01.8 11.2 60.1	58	03 32	04 23	05 03	17 30	18 56	20 19	21 38			
	05	258 05.4 50.9	81 25.5 8.4 5 13.0 11.2 60.1	S 60	03 22	04 17	05 00	17 32	19 01	20 27	21 47			
	06	273 05.6 S 5 51.8	95 52.9 8.5 N 5 24.2 11.1 60.1											
	07	288 05.8 52.8	110 20.4 8.5 5 35.3 11.1 60.0	Lat.	Sunset	Twilight		Moonset						
	08	303 05.9 53.7	124 47.9 8.4 5 46.4 11.1 60.0			Civil	Naut.	7	8	9	10			
	09	318 06.1 54.7	139 15.3 8.5 5 57.5 11.0 60.0											
	10	333 06.3 55.6	153 42.8 8.4 6 08.5 10.9 60.0											
	11	348 06.5 56.6	168 10.2 8.5 6 19.4 10.9 60.0	N 72	16 43	17 51	19 09	04 46	06 45	08 45	10 44			
	12	3 06.7 S 5 57.5	182 37.7 8.4 N 6 30.3 10.9 59.9	N 70	16 50	17 51	19 02	04 46	06 37	08 28	10 16			
	13	18 06.8 58.5	197 05.1 8.5 6 41.2 10.8 59.9	68	16 56	17 52	18 56	04 45	06 31	08 15	09 56			
	14	33 07.0 59.5	211 32.6 8.4 6 52.0 10.8 59.9	66	17 01	17 52	18 51	04 45	06 26	08 04	09 39			
	15	48 07.2 60.4	226 00.0 8.5 7 02.8 10.7 59.9	64	17 05	17 53	18 48	04 45	06 21	07 55	09 26			
	16	63 07.4 61.4	240 27.5 8.4 7 13.5 10.6 59.9	62	17 09	17 53	18 44	04 44	06 17	07 48	09 15			
	17	78 07.5 62.3	254 54.9 8.5 7 24.1 10.6 59.8	60	17 12	17 54	18 42	04 44	06 14	07 41	09 05			
	18	93 07.7 S 6 03.3	269 22.4 8.5 N 7 34.7 10.6 59.8	N 58	17 15	17 54	18 39	04 44	06 11	07 36	08 57			
	19	108 07.9 64.2	283 49.9 8.4 7 45.3 10.5 59.8	56	17 17	17 55	18 37	04 44	06 08	07 30	08 49			
	20	123 08.1 65.2	298 17.3 8.5 7 55.8 10.4 59.8	54	17 20	17 55	18 36	04 43	06 06	07 26	08 43			
	21	138 08.2 66.1	312 44.8 8.4 8 06.2 10.4 59.7	52	17 22	17 56	18 34	04 43	06 03	07 22	08 37			
	22	153 08.4 67.1	327 12.2 8.5 8 16.6 10.3 59.7	50	17 24	17 56	18 33	04 43	06 01	07 18	08 32			
23	168 08.6 68.0	341 39.7 8.4 8 26.9 10.3 59.7	45	17 28	17 57	18 31	04 43	05 57	07 10	08 20				
THURSDAY	9 00	183 08.8 S 6 09.0	356 07.1 8.5 N 8 37.2 10.1 59.7	N 40	17 31	17 59	18 30	04 43	05 54	07 03	08 11			
	01	198 08.9 10.9	10 34.6 8.4 8 47.3 10.2 59.6	35	17 35	18 00	18 29	04 42	05 50	06 58	08 03			
	02	213 09.1 11.8	25 02.0 8.5 8 57.5 10.0 59.6	30	17 37	18 01	18 29	04 42	05 48	06 53	07 56			
	03	228 09.3 12.8	39 29.5 8.4 9 07.5 10.0 59.6	20	17 42	18 04	18 30	04 42	05 43	06 44	07 44			
	04	243 09.4 13.7	53 56.9 8.4 9 17.5 10.0 59.6	N 10	17 47	18 08	18 32	04 41	05 39	06 36	07 33			
	05	258 09.6 14.7	68 24.3 8.5 9 27.5 9.8 59.5	0	17 51	18 12	18 36	04 41	05 35	06 29	07 23			
	06	273 09.8 S 6 14.7	82 51.8 8.4 N 9 37.3 9.8 59.5	S 10	17 55	18 16	18 41	04 40	05 31	06 22	07 13			
	07	288 10.0 15.6	97 19.2 8.5 9 47.1 9.8 59.5	20	18 00	18 22	18 48	04 40	05 27	06 14	07 02			
	08	303 10.1 16.6	111 46.7 8.4 9 56.9 9.6 59.4	30	18 05	18 30	18 58	04 39	05 22	06 06	06 50			
	09	318 10.3 17.5	126 14.1 8.5 10 06.5 9.6 59.4	35	18 09	18 34	19 04	04 39	05 19	06 01	06 43			
	10	333 10.5 18.5	140 41.6 8.4 10 16.1 9.5 59.4	40	18 12	18 40	19 12	04 39	05 16	05 55	06 35			
	11	348 10.7 19.4	155 09.0 8.5 10 25.6 9.5 59.4	45	18 17	18 47	19 22	04 38	05 13	05 48	06 26			
	12	3 10.8 S 6 20.4	169 36.5 8.4 N10 35.1 9.3 59.3	S 50	18 22	18 55	19 35	04 38	05 08	05 40	06 15			
	13	18 11.0 21.3	184 03.9 8.5 10 44.4 9.3 59.3	52	18 24	18 59	19 41	04 38	05 07	05 37	06 10			
	14	33 11.2 22.3	198 31.4 8.4 10 53.7 9.3 59.3	54	18 27	19 03	19 48	04 37	05 04	05 33	06 04			
	15	48 11.3 23.2	212 58.8 8.4 11 03.0 9.1 59.2	56	18 30	19 08	19 56	04 37	05 02	05 29	05 58			
	16	63 11.5 24.2	227 26.2 8.5 11 12.1 9.1 59.2	58	18 33	19 14	20 05	04 37	04 59	05 24	05 51			
	17	78 11.7 25.1	241 53.7 8.4 11 21.2 8.9 59.2	S 60	18 37	19 20	20 16	04 36	04 57	05 18	05 43			
	18	93 11.8 S 6 26.1	256 21.1 8.5 N11 30.1 8.9 59.1											
	19	108 12.0 27.0	270 48.6 8.4 11 39.0 8.9 59.1	Day	Eqn. of Time		Mer.	Mer. Pass.		Age	Phase			
	20	123 12.2 28.0	285 16.0 8.5 11 47.9 8.7 59.1		00 ^h	12 ^h	Pass.	Upper	Lower					
	21	138 12.4 28.9	299 43.5 8.4 11 56.6 8.7 59.1		d	m s	m s	h m	h m	h m	d %			
	22	153 12.5 29.8	314 10.9 8.5 12 05.3 8.6 59.0		7	12 00	12 09	11 48	23 22	10 55	13 99			
23	168 12.7 30.8	328 38.4 8.5 N12 13.9 8.5 59.0		8	12 18	12 26	11 48	24 16	11 49	14 100				
	SD 16.0 <i>d</i> 1.0	SD 16.4 16.3 16.2		9	12 35	12 43	11 47	00 16	12 43	15 99				

