ЛАБОРАТОРНАЯ РАБОТА №5

РАСЧЕТ МЕСТНОГО ЧАСОВОГО УГЛА И СКЛОНЕНИЯ СОЛНЦА, ЛУНЫ И ПЛАНЕТ

Учебная цель: Научиться решению задач по нахождению местного часового угла и склонения Солнца, Луны и планет.

РАСЧЕТ ПО NAUTICAL ALMANAC

<u>Пример</u>

Дата : 01.01.2020

Судовое время Тс = 19ч 35м

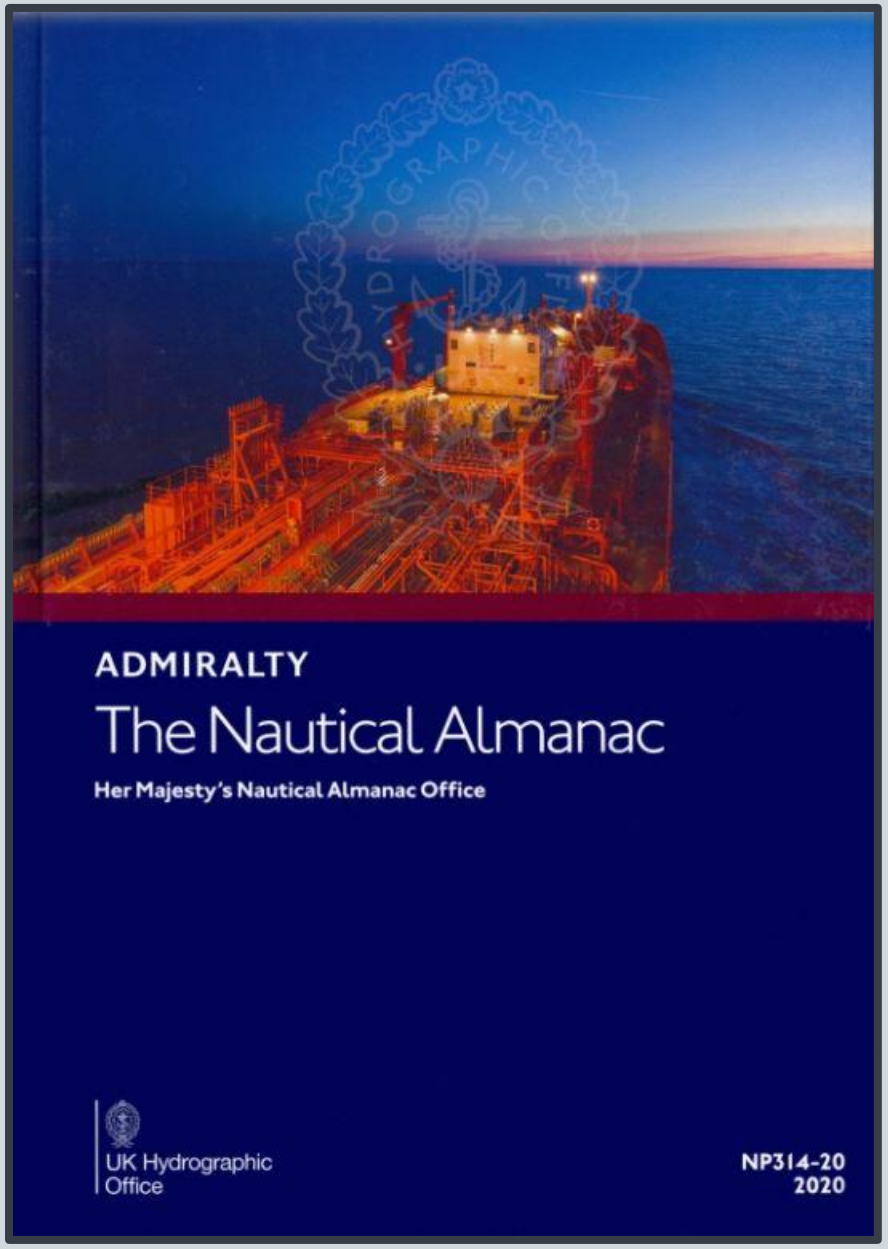
Долгота Longitude = 148 º 30,5 ’ W

Наблюдение Солнца, Луны и Венеры.

в момент времени по хронометру Тхр = 5ч 37м 43с

Поправка хронометра Uхр = - 2м 15 с

<u>Вычислить</u>: LHA и Declination Солнца, Луны и Венеры.



ХОД РЕШЕНИЯ:

Переводим судовое время во время по Гринвичу. Для этого необходимо найти часовой пояс, то есть долготу разделить на 15^0.

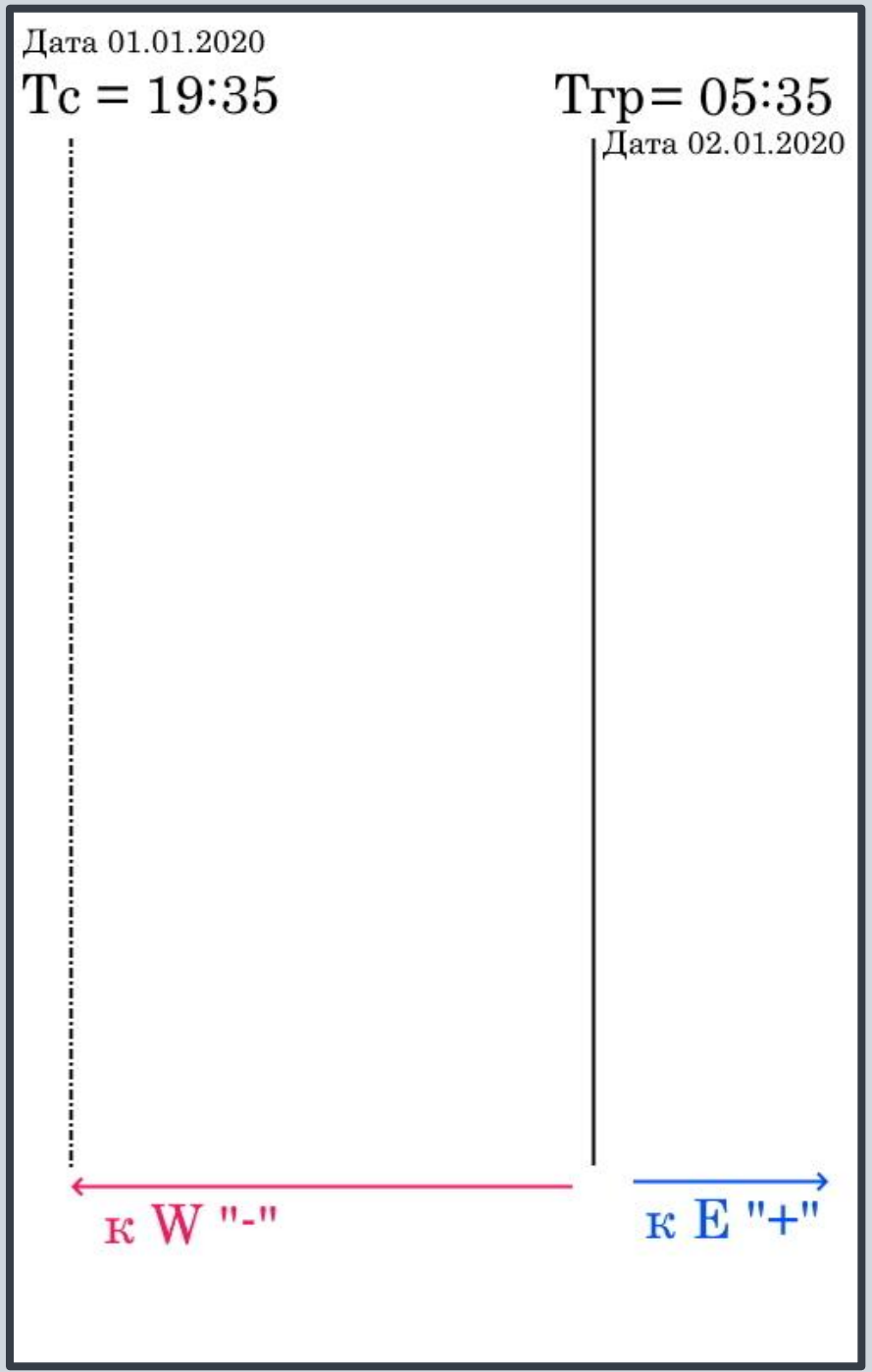
№ = 148 ° 30,5 ’ /15 = 10 часовой пояс. Так как долгота Западная, то часовой пояс = - 10 часов от Гринвичского меридиана.

Таким образом

Тгр = Тс + № = 19ч 35м + 10ч = 05ч 35м (дата 02.01.2020)

Исправляем время по хронометру, прибавив поправку:

Тгр = Тхр + Uхр = 05ч 37м 43с + (-2 м 15 с) = 05ч 35м 28с



ЗАПИСЫВАЕМ В ТАБЛИЦУ РАСЧЕТ ВРЕМЕНИ.

				Sun	*Moon*	*Venus*
T_c № *w*	19ч35м +10	01.01	T_{xp} U_{xp}	05ч37м43с -2 15	05ч37м43с -2 15	05ч37м43с -2 15
$T_{гр}$	5ч35м	02.01	$T_{гр}$	05ч35м28с	05ч35м28с	05ч35м28с
Ежедн. табл→ Increments & Corrections→ Increments & Corrections→			*GHA* Corr. (minutes) V corr.			
			*GHA** λ			
Обыкновенный счет→ Практический счет→			*LHA* *LHA*			
Ежедн. табл→ Increments & Corrections→			*Dec* d corr.			
			Dec			

GHA и v CORRECTION

На дату и целый час Тгр выбираем из

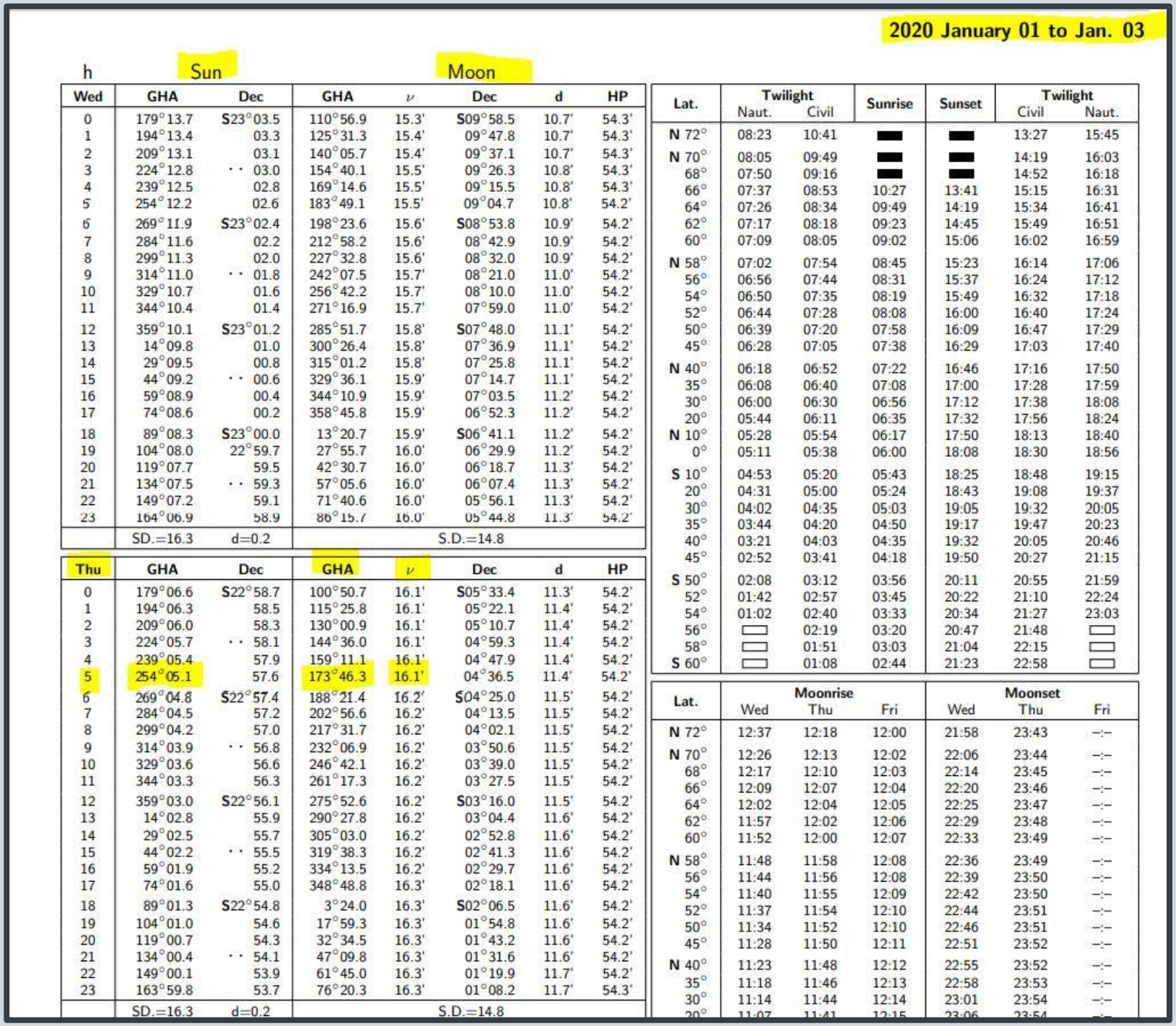
Nautical Almanac

GHA для Солнца, Луны.

(Ежедневные таблицы)

Также записываем v_CORRECTION для

Луны и планет.



2020 January 01 to Jan. 03

h	Sun		Moon				
Wed	GHA	Dec	GHA	v	Dec	d	HP
0	179°13.7	S23°03.5	110°56.9	15.3'	S09°58.5	10.7'	54.3'
1	194°13.4	03.3	125°31.3	15.4'	09°47.8	10.7'	54.3'
2	209°13.1	03.1	140°05.7	15.4'	09°37.1	10.7'	54.3'
3	224°12.8	·· 03.0	154°40.1	15.5'	09°26.3	10.8'	54.3'
4	239°12.5	02.8	169°14.6	15.5'	09°15.5	10.8'	54.3'
5	254°12.2	02.6	183°49.1	15.5'	09°04.7	10.8'	54.2'
6	269°11.9	S23°02.4	198°23.6	15.6'	S08°53.8	10.9'	54.2'
7	284°11.6	02.2	212°58.2	15.6'	08°42.9	10.9'	54.2'
8	299°11.3	02.0	227°32.8	15.6'	08°32.0	10.9'	54.2'
9	314°11.0	·· 01.8	242°07.5	15.7'	08°21.0	11.0'	54.2'
10	329°10.7	01.6	256°42.2	15.7'	08°10.0	11.0'	54.2'
11	344°10.4	01.4	271°16.9	15.7'	07°59.0	11.0'	54.2'
12	359°10.1	S23°01.2	285°51.7	15.8'	S07°48.0	11.1'	54.2'
13	14°09.8	01.0	300°26.4	15.8'	07°36.9	11.1'	54.2'
14	29°09.5	00.8	315°01.2	15.8'	07°25.8	11.1'	54.2'
15	44°09.2	·· 00.6	329°36.1	15.9'	07°14.7	11.1'	54.2'
16	59°08.9	00.4	344°10.9	15.9'	07°03.5	11.2'	54.2'
17	74°08.6	00.2	358°45.8	15.9'	06°52.3	11.2'	54.2'
18	89°08.3	S23°00.0	13°20.7	15.9'	S06°41.1	11.2'	54.2'
19	104°08.0	22°59.7	27°55.7	16.0'	06°29.9	11.2'	54.2'
20	119°07.7	59.5	42°30.7	16.0'	06°18.7	11.3'	54.2'
21	134°07.5	·· 59.3	57°05.6	16.0'	06°07.4	11.3'	54.2'
22	149°07.2	59.1	71°40.6	16.0'	05°56.1	11.3'	54.2'
23	164°06.9	58.9	86°15.7	16.0'	05°44.8	11.3'	54.2'
	SD.=16.3	d=0.2	S.D.=14.8				

Thu	GHA	Dec	GHA	v	Dec	d	HP
0	179°06.6	S22°58.7	100°50.7	16.1'	S05°33.4	11.3'	54.2'
1	194°06.3	58.5	115°25.8	16.1'	05°22.1	11.4'	54.2'
2	209°06.0	58.3	130°00.9	16.1'	05°10.7	11.4'	54.2'
3	224°05.7	·· 58.1	144°36.0	16.1'	04°59.3	11.4'	54.2'
4	239°05.4	57.9	159°11.1	16.1'	04°47.9	11.4'	54.2'
5	254°05.1	57.6	173°46.3	16.1'	04°36.5	11.4'	54.2'
6	269°04.8	S22°57.4	188°21.4	16.2'	S04°25.0	11.5'	54.2'
7	284°04.5	57.2	202°56.6	16.2'	04°13.5	11.5'	54.2'
8	299°04.2	57.0	217°31.7	16.2'	04°02.1	11.5'	54.2'
9	314°03.9	·· 56.8	232°06.9	16.2'	03°50.6	11.5'	54.2'
10	329°03.6	56.6	246°42.1	16.2'	03°39.0	11.5'	54.2'
11	344°03.3	56.3	261°17.3	16.2'	03°27.5	11.5'	54.2'
12	359°03.0	S22°56.1	275°52.6	16.2'	S03°16.0	11.5'	54.2'
13	14°02.8	55.9	290°27.8	16.2'	03°04.4	11.6'	54.2'
14	29°02.5	55.7	305°03.0	16.2'	02°52.8	11.6'	54.2'
15	44°02.2	·· 55.5	319°38.3	16.2'	02°41.3	11.6'	54.2'
16	59°01.9	55.2	334°13.5	16.2'	02°29.7	11.6'	54.2'
17	74°01.6	55.0	348°48.8	16.3'	02°18.1	11.6'	54.2'
18	89°01.3	S22°54.8	3°24.0	16.3'	S02°06.5	11.6'	54.2'
19	104°01.0	54.6	17°59.3	16.3'	01°54.8	11.6'	54.2'
20	119°00.7	54.3	32°34.5	16.3'	01°43.2	11.6'	54.2'
21	134°00.4	·· 54.1	47°09.8	16.3'	01°31.6	11.6'	54.2'
22	149°00.1	53.9	61°45.0	16.3'	01°19.9	11.7'	54.2'
23	163°59.8	53.7	76°20.3	16.3'	01°08.2	11.7'	54.3'
	SD.=16.3	d=0.2	S.D.=14.8				

Lat.	Twilight		Sunrise	Sunset	Twilight	
	Naut.	Civil			Civil	Naut.
N 72°	08:23	10:41	▬	▬	13:27	15:45
N 70°	08:05	09:49	▬	▬	14:19	16:03
68°	07:50	09:16	▬	▬	14:52	16:18
66°	07:37	08:53	10:27	13:41	15:15	16:31
64°	07:26	08:34	09:49	14:19	15:34	16:41
62°	07:17	08:18	09:23	14:45	15:49	16:51
60°	07:09	08:05	09:02	15:06	16:02	16:59
N 58°	07:02	07:54	08:45	15:23	16:14	17:06
56°	06:56	07:44	08:31	15:37	16:24	17:12
54°	06:50	07:35	08:19	15:49	16:32	17:18
52°	06:44	07:28	08:08	16:00	16:40	17:24
50°	06:39	07:20	07:58	16:09	16:47	17:29
45°	06:28	07:05	07:38	16:29	17:03	17:40
N 40°	06:18	06:52	07:22	16:46	17:16	17:50
35°	06:08	06:40	07:08	17:00	17:28	17:59
30°	06:00	06:30	06:56	17:12	17:38	18:08
20°	05:44	06:11	06:35	17:32	17:56	18:24
N 10°	05:28	05:54	06:17	17:50	18:13	18:40
0°	05:11	05:38	06:00	18:08	18:30	18:56
S 10°	04:53	05:20	05:43	18:25	18:48	19:15
20°	04:31	05:00	05:24	18:43	19:08	19:37
30°	04:02	04:35	05:03	19:05	19:32	20:05
35°	03:44	04:20	04:50	19:17	19:47	20:23
40°	03:21	04:03	04:35	19:32	20:05	20:46
45°	02:52	03:41	04:18	19:50	20:27	21:15
S 50°	02:08	03:12	03:56	20:11	20:55	21:59
52°	01:42	02:57	03:45	20:22	21:10	22:24
54°	01:02	02:40	03:33	20:34	21:27	23:03
56°	▭	02:19	03:20	20:47	21:48	▭
58°	▭	01:51	03:03	21:04	22:15	▭
S 60°	▭	01:08	02:44	21:23	22:58	▭

Lat.	Moonrise			Moonset		
	Wed	Thu	Fri	Wed	Thu	Fri
N 72°	12:37	12:18	12:00	21:58	23:43	–:–
N 70°	12:26	12:13	12:02	22:06	23:44	–:–
68°	12:17	12:10	12:03	22:14	23:45	–:–
66°	12:09	12:07	12:04	22:20	23:46	–:–
64°	12:02	12:04	12:05	22:25	23:47	–:–
62°	11:57	12:02	12:06	22:29	23:48	–:–
60°	11:52	12:00	12:07	22:33	23:49	–:–
N 58°	11:48	11:58	12:08	22:36	23:49	–:–
56°	11:44	11:56	12:08	22:39	23:50	–:–
54°	11:40	11:55	12:09	22:42	23:50	–:–
52°	11:37	11:54	12:10	22:44	23:51	–:–
50°	11:34	11:52	12:10	22:46	23:51	–:–
45°	11:28	11:50	12:11	22:51	23:52	–:–
N 40°	11:23	11:48	12:12	22:55	23:52	–:–
35°	11:18	11:46	12:13	22:58	23:53	–:–
30°	11:14	11:44	12:14	23:01	23:54	–:–
20°	11:07	11:41	12:15	23:06	23:54	–:–

GHA и V CORRECTION

Тоже самое делаем для Венеры (или другой заданной по условию планеты).

January 01, 02, 03 (Wed., Thu., Fri.)

	Aries	Venus		Mars		Jupiter		Saturn	
Wed	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	100°07.0	142°40.8	S18°15.9	223°53.4	S19°26.7	182°51.5	S23°10.8	167°00.1	S21°41.1
1	115°09.5	157°40.2	15.0	238°54.2	27.1	197°53.3	10.8	182°02.3	41.0
2	130°11.9	172°39.6	14.1	253°54.9	27.5	212°55.1	10.7	197°04.4	41.0
3	145°14.4	187°39.0	·· 13.2	268°55.6	·· 27.9	227°57.0	·· 10.7	212°06.6	·· 40.9
4	160°16.9	202°38.4	12.2	283°56.4	28.3	242°58.8	10.7	227°08.7	40.9
5	175°19.3	217°37.7	11.3	298°57.1	28.7	258°00.7	10.7	242°10.9	40.8
6	190°21.8	232°37.1	S18°10.4	313°57.8	S19°29.1	273°02.5	S23°10.6	257°13.0	S21°40.8
7	205°24.3	247°36.5	09.5	328°58.5	29.5	288°04.3	10.6	272°15.2	40.8
8	220°26.7	262°35.9	08.6	343°59.3	29.9	303°06.2	10.6	287°17.3	40.7
9	235°29.2	277°35.3	·· 07.6	359°00.0	·· 30.3	318°08.0	·· 10.6	302°19.5	·· 40.7
10	250°31.7	292°34.7	06.7	14°00.7	30.6	333°09.8	10.5	317°21.6	40.6
11	265°34.1	307°34.1	05.8	29°01.5	31.0	348°11.7	10.5	332°23.8	40.6
12	280°36.6	322°33.5	S18°04.8	44°02.2	S19°31.4	3°13.5	S23°10.5	347°26.0	S21°40.5
13	295°39.0	337°32.9	03.9	59°02.9	31.8	18°15.4	10.5	2°28.1	40.5
14	310°41.5	352°32.3	03.0	74°03.6	32.2	33°17.2	10.4	17°30.3	40.5
15	325°44.0	7°31.7	·· 02.1	89°04.4	·· 32.6	48°19.0	·· 10.4	32°32.4	·· 40.4
16	340°46.4	22°31.1	01.1	104°05.1	33.0	63°20.9	10.4	47°34.6	40.4
17	355°48.9	37°30.5	18°00.2	119°05.8	33.4	78°22.7	10.4	62°36.7	40.3
18	10°51.4	52°29.9	S17°59.3	134°06.6	S19°33.8	93°24.6	S23°10.3	77°38.9	S21°40.3
19	25°53.8	67°29.3	58.3	149°07.3	34.2	108°26.4	10.3	92°41.0	40.2
20	40°56.3	82°28.7	57.4	164°08.0	34.6	123°28.2	10.3	107°43.2	40.2
21	55°58.8	97°28.1	·· 56.5	179°08.7	·· 35.0	138°30.1	·· 10.2	122°45.3	·· 40.2
22	71°01.2	112°27.5	55.5	194°09.5	35.3	153°31.9	10.2	137°47.5	40.1
23	86°03.7	127°26.9	54.6	209°10.2	35.7	168°33.7	10.2	152°49.6	40.1
Mer.pass.:17:17		v-0.6 d0.9 m-3.9		v0.7 d-0.4 m1.6		v1.8 d0.0 m-1.7		v2.2 d0.0 m0.6	

Thu	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	101°06.1	142°26.3	S17°53.7	224°10.9	S19°36.1	183°35.6	S23°10.2	167°51.8	S21°40.0
1	116°08.6	157°25.7	52.7	239°11.7	36.5	198°37.4	10.1	182°53.9	40.0
2	131°11.1	172°25.1	51.8	254°12.4	36.9	213°39.3	10.1	197°56.1	39.9
3	146°13.5	187°24.5	·· 50.8	269°13.1	·· 37.3	228°41.1	·· 10.1	212°58.2	·· 39.9
4	161°16.0	202°23.9	49.9	284°13.8	37.7	243°42.9	10.1	228°00.4	39.9
5	176°18.5	217°23.3	49.0	299°14.6	38.1	258°44.8	10.0	243°02.5	39.8
6	191°20.9	232°22.7	S17°48.0	314°15.3	S19°38.5	273°46.6	S23°10.0	258°04.7	S21°39.8
7	206°23.4	247°22.1	47.1	329°16.0	38.8	288°48.4	10.0	273°06.8	39.7
8	221°25.9	262°21.5	46.1	344°16.7	39.2	303°50.3	10.0	288°09.0	39.7
9	236°28.3	277°20.9	·· 45.2	359°17.5	·· 39.6	318°52.1	·· 09.9	303°11.1	·· 39.6
10	251°30.8	292°20.3	44.2	14°18.2	40.0	333°54.0	09.9	318°13.3	39.6
11	266°33.3	307°19.7	43.3	29°18.9	40.4	348°55.8	09.9	333°15.5	39.5
12	281°35.7	322°19.1	S17°42.3	44°19.6	S19°40.8	3°57.6	S23°09.9	348°17.6	S21°39.5
13	296°38.2	337°18.6	41.4	59°20.4	41.2	18°59.5	09.8	3°19.8	39.5
14	311°40.6	352°18.0	40.4	74°21.1	41.6	34°01.3	09.8	18°21.9	39.4
15	326°43.1	7°17.4	·· 39.5	89°21.8	·· 41.9	49°03.2	·· 09.8	33°24.1	·· 39.4
16	341°45.6	22°16.8	38.5	104°22.5	42.3	64°05.0	09.7	48°26.2	39.3
17	356°48.0	37°16.2	37.6	119°23.3	42.7	79°06.8	09.7	63°28.4	39.3
18	11°50.5	52°15.6	S17°36.6	134°24.0	S19°43.1	94°08.7	S23°09.7	78°30.5	S21°39.2
19	26°53.0	67°15.0	35.7	149°24.7	43.5	109°10.5	09.7	93°32.7	39.2
20	41°55.4	82°14.4	34.7	164°25.4	43.9	124°12.4	09.6	108°34.8	39.2
21	56°57.9	97°13.9	·· 33.8	179°26.2	·· 44.2	139°14.2	·· 09.6	123°37.0	·· 39.1
22	72°00.4	112°13.3	32.8	194°26.9	44.6	154°16.0	09.6	138°39.1	39.1
23	87°02.8	127°12.7	31.9	209°27.6	45.0	169°17.9	09.6	153°41.3	39.0
Mer.pass.:17:13		v-0.6 d0.9 m-3.9		v0.7 d-0.4 m1.6		v1.8 d0.0 m-1.7		v2.2 d0.0 m0.6	

ЗАПИСЫВАЕМ ЗНАЧЕНИЯ В ТАБЛИЦУ

				Sun	*Moon*	*Venus*
T_c	$19^ч35^м$	01.01	$T_{хр}$	$05^ч37^м43^с$	$05^ч37^м43^с$	$05^ч37^м43^с$
№ *w*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	$5^ч35^м$	02.01	$T_{гр}$	$05^ч35^м28^с$	$05^ч35^м28^с$	$05^ч35^м28^с$
Ежедн. табл→			*GHA*	254°05,1′	173°46,3′	217°23,3′
Increments & Corrections→			Corr. (minutes)			
Increments & Corrections→			V corr.	-	(+16,1)	(-0,6)
			*GHA**			
			λ			
Обыкновенный счет→			*LHA*			
Практический счет→			*LHA*			
Ежедн. табл→			*Dec*			
Increments & Corrections→			d corr.			
			Dec			

INCREMENTS AND CORRECTIONS

На последних страницах альманаха находим в Increments and corrections поправку (Corr.) на минуты и секунды Тгр (35м 28с). А также значения V correction.

Increments and Corrections

Aries	Moon	v and d corr			m 35	Sun Plan.	Aries	Moon	v and d corr		
8°31.4	8°06.8	0.0 - 0.0	6.0 - 3.4	12.0 - 6.9	0	8°45.0	8°46.4	8°21.1	0.0 - 0.0	6.0 - 3.5	12.0 - 7.1
8°31.6	8°07.0	0.1 - 0.1	6.1 - 3.5	12.1 - 7.0	1	8°45.2	8°46.7	8°21.3	0.1 - 0.1	6.1 - 3.6	12.1 - 7.2
8°31.9	8°07.2	0.2 - 0.1	6.2 - 3.6	12.2 - 7.0	2	8°45.5	8°46.9	8°21.6	0.2 - 0.1	6.2 - 3.7	12.2 - 7.2
8°32.1	8°07.5	0.3 - 0.2	6.3 - 3.6	12.3 - 7.1	3	8°45.7	8°47.2	8°21.8	0.3 - 0.2	6.3 - 3.7	12.3 - 7.3
8°32.4	8°07.7	0.4 - 0.2	6.4 - 3.7	12.4 - 7.1	4	8°46.0	8°47.4	8°22.0	0.4 - 0.2	6.4 - 3.8	12.4 - 7.3
8°32.6	8°08.0	0.5 - 0.3	6.5 - 3.7	12.5 - 7.2	5	8°46.3	8°47.7	8°22.3	0.5 - 0.3	6.5 - 3.8	12.5 - 7.4
8°32.9	8°08.2	0.6 - 0.3	6.6 - 3.8	12.6 - 7.2	6	8°46.5	8°47.9	8°22.5	0.6 - 0.4	6.6 - 3.9	12.6 - 7.5
8°33.1	8°08.4	0.7 - 0.4	6.7 - 3.9	12.7 - 7.3	7	8°46.8	8°48.2	8°22.8	0.7 - 0.4	6.7 - 4.0	12.7 - 7.5
8°33.4	8°08.7	0.8 - 0.5	6.8 - 3.9	12.8 - 7.4	8	8°47.0	8°48.4	8°23.0	0.8 - 0.5	6.8 - 4.0	12.8 - 7.6
8°33.7	8°08.9	0.9 - 0.5	6.9 - 4.0	12.9 - 7.4	9	8°47.2	8°48.7	8°23.2	0.9 - 0.5	6.9 - 4.1	12.9 - 7.6
8°33.9	8°09.2	1.0 - 0.6	7.0 - 4.0	13.0 - 7.5	10	8°47.5	8°48.9	8°23.5	1.0 - 0.6	7.0 - 4.1	13.0 - 7.7
8°34.2	8°09.4	1.1 - 0.6	7.1 - 4.1	13.1 - 7.5	11	8°47.7	8°49.2	8°23.7	1.1 - 0.7	7.1 - 4.2	13.1 - 7.8
8°34.4	8°09.6	1.2 - 0.7	7.2 - 4.1	13.2 - 7.6	12	8°48.0	8°49.4	8°23.9	1.2 - 0.7	7.2 - 4.3	13.2 - 7.8
8°34.7	8°09.9	1.3 - 0.7	7.3 - 4.2	13.3 - 7.6	13	8°48.3	8°49.7	8°24.2	1.3 - 0.8	7.3 - 4.3	13.3 - 7.9
8°34.9	8°10.1	1.4 - 0.8	7.4 - 4.3	13.4 - 7.7	14	8°48.5	8°49.9	8°24.4	1.4 - 0.8	7.4 - 4.4	13.4 - 7.9
8°35.2	8°10.3	1.5 - 0.9	7.5 - 4.3	13.5 - 7.8	15	8°48.8	8°50.2	8°24.7	1.5 - 0.9	7.5 - 4.4	13.5 - 8.0
8°35.4	8°10.6	1.6 - 0.9	7.6 - 4.4	13.6 - 7.8	16	8°49.0	8°50.4	8°24.9	1.6 - 0.9	7.6 - 4.5	13.6 - 8.0
8°35.7	8°10.8	1.7 - 1.0	7.7 - 4.4	13.7 - 7.9	17	8°49.2	8°50.7	8°25.1	1.7 - 1.0	7.7 - 4.6	13.7 - 8.1
8°35.9	8°11.1	1.8 - 1.0	7.8 - 4.5	13.8 - 7.9	18	8°49.5	8°50.9	8°25.4	1.8 - 1.1	7.8 - 4.6	13.8 - 8.2
8°36.2	8°11.3	1.9 - 1.1	7.9 - 4.5	13.9 - 8.0	19	8°49.8	8°51.2	8°25.6	1.9 - 1.1	7.9 - 4.7	13.9 - 8.2
8°36.4	8°11.5	2.0 - 1.1	8.0 - 4.6	14.0 - 8.0	20	8°50.0	8°51.4	8°25.9	2.0 - 1.2	8.0 - 4.7	14.0 - 8.3
8°36.7	8°11.8	2.1 - 1.2	8.1 - 4.7	14.1 - 8.1	21	8°50.3	8°51.7	8°26.1	2.1 - 1.2	8.1 - 4.8	14.1 - 8.3
8°36.9	8°12.0	2.2 - 1.3	8.2 - 4.7	14.2 - 8.2	22	8°50.5	8°52.0	8°26.3	2.2 - 1.3	8.2 - 4.9	14.2 - 8.4
8°37.2	8°12.3	2.3 - 1.3	8.3 - 4.8	14.3 - 8.2	23	8°50.7	8°52.2	8°26.6	2.3 - 1.4	8.3 - 4.9	14.3 - 8.5
8°37.4	8°12.5	2.4 - 1.4	8.4 - 4.8	14.4 - 8.3	24	8°51.0	8°52.5	8°26.8	2.4 - 1.4	8.4 - 5.0	14.4 - 8.5
8°37.7	8°12.7	2.5 - 1.4	8.5 - 4.9	14.5 - 8.3	25	8°51.2	8°52.7	8°27.0	2.5 - 1.5	8.5 - 5.0	14.5 - 8.6
8°37.9	8°13.0	2.6 - 1.5	8.6 - 4.9	14.6 - 8.4	26	8°51.5	8°53.0	8°27.3	2.6 - 1.5	8.6 - 5.1	14.6 - 8.6
8°38.2	8°13.2	2.7 - 1.6	8.7 - 5.0	14.7 - 8.5	27	8°51.8	8°53.2	8°27.5	2.7 - 1.6	8.7 - 5.1	14.7 - 8.7
8°38.4	8°13.4	2.8 - 1.6	8.8 - 5.1	14.8 - 8.5	28	8°52.0	8°53.5	8°27.8	2.8 - 1.7	8.8 - 5.2	14.8 - 8.8
8°38.7	8°13.7	2.9 - 1.7	8.9 - 5.1	14.9 - 8.6	29	8°52.3	8°53.7	8°28.0	2.9 - 1.7	8.9 - 5.3	14.9 - 8.8
8°38.9	8°13.9	3.0 - 1.7	9.0 - 5.2	15.0 - 8.6	30	8°52.5	8°54.0	8°28.2	3.0 - 1.8	9.0 - 5.3	15.0 - 8.9
8°39.2	8°14.2	3.1 - 1.8	9.1 - 5.2	15.1 - 8.7	31	8°52.7	8°54.2	8°28.5	3.1 - 1.8	9.1 - 5.4	15.1 - 8.9
8°39.4	8°14.4	3.2 - 1.8	9.2 - 5.3	15.2 - 8.7	32	8°53.0	8°54.5	8°28.7	3.2 - 1.9	9.2 - 5.4	15.2 - 9.0
8°39.7	8°14.6	3.3 - 1.9	9.3 - 5.3	15.3 - 8.8	33	8°53.2	8°54.7	8°29.0	3.3 - 2.0	9.3 - 5.5	15.3 - 9.1
8°39.9	8°14.9	3.4 - 2.0	9.4 - 5.4	15.4 - 8.9	34	8°53.5	8°55.0	8°29.2	3.4 - 2.0	9.4 - 5.6	15.4 - 9.1
8°40.2	8°15.1	3.5 - 2.0	9.5 - 5.5	15.5 - 8.9	35	8°53.8	8°55.2	8°29.4	3.5 - 2.1	9.5 - 5.6	15.5 - 9.2
8°40.4	8°15.4	3.6 - 2.1	9.6 - 5.5	15.6 - 9.0	36	8°54.0	8°55.5	8°29.7	3.6 - 2.1	9.6 - 5.7	15.6 - 9.2
8°40.7	8°15.6	3.7 - 2.1	9.7 - 5.6	15.7 - 9.0	37	8°54.3	8°55.7	8°29.9	3.7 - 2.2	9.7 - 5.7	15.7 - 9.3
8°40.9	8°15.8	3.8 - 2.2	9.8 - 5.6	15.8 - 9.1	38	8°54.5	8°56.0	8°30.2	3.8 - 2.2	9.8 - 5.8	15.8 - 9.3
8°41.2	8°16.1	3.9 - 2.2	9.9 - 5.7	15.9 - 9.1	39	8°54.7	8°56.2	8°30.4	3.9 - 2.3	9.9 - 5.9	15.9 - 9.4
8°41.4	8°16.3	4.0 - 2.3	10.0 - 5.8	16.0 - 9.2	40	8°55.0	8°56.5	8°30.6	4.0 - 2.4	10.0 - 5.9	16.0 - 9.5
8°41.7	8°16.5	4.1 - 2.4	10.1 - 5.8	16.1 - 9.3	41	8°55.2	8°56.7	8°30.9	4.1 - 2.4	10.1 - 6.0	16.1 - 9.5
8°41.9	8°16.8	4.2 - 2.4	10.2 - 5.9	16.2 - 9.3	42	8°55.5	8°57.0	8°31.1	4.2 - 2.5	10.2 - 6.0	16.2 - 9.6
8°42.2	8°17.0	4.3 - 2.5	10.3 - 5.9	16.3 - 9.4	43	8°55.8	8°57.2	8°31.3	4.3 - 2.5	10.3 - 6.1	16.3 - 9.6
8°42.4	8°17.3	4.4 - 2.5	10.4 - 6.0	16.4 - 9.4	44	8°56.0	8°57.5	8°31.6	4.4 - 2.6	10.4 - 6.2	16.4 - 9.7

Записываем значения в таблицу

И выполняем расчет.

				Sun	*Moon*	*Venus*
T_c	19ч35м	01.01	$T_{хр}$	05ч37м43с	05ч37м43с	05ч37м43с
№ *W*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	5ч35м	02.01	$T_{гр}$	05ч35м28с	05ч35м28с	05ч35м28с
Ежедн. табл→			*GHA*	254°05,1′	173°46,3′	217°23,3′
Increments & Corrections→			Corr. (minutes)	08°52,0′	08°27,8′	08°52,0′
Increments & Corrections→			V corr.	-	(+16,1) +9,5′	(-0,6) -0,4′
			*GHA**	262°57,1′	182°23,6′	226°14,9′
			λ			
Обыкновенный счет→			*LHA*			
Практический счет→			*LHA*			
Ежедн. табл→			*Dec*			
Increments & Corrections→			d corr.			
			Dec			

РАСЧЕТ LHA

Находим местный часовой угол,

Переводим в практический счет,

если необходимо.

Правила перевода LHA такие же,

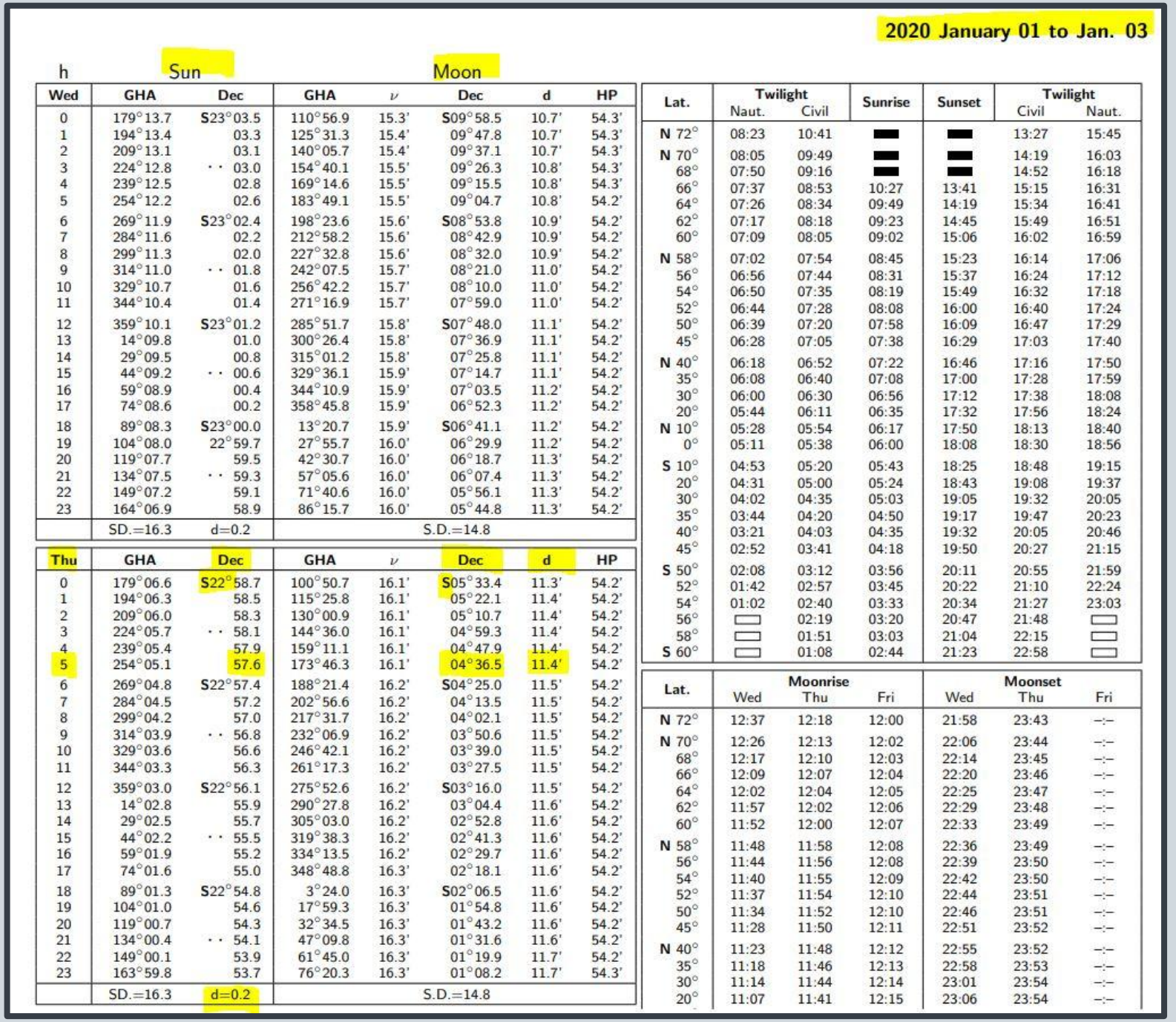
Как и при расчете для светил

(Лабораторная номер 4)

				Sun	*Moon*	*Venus*
T_c	$19^ч35^м$	01.01	$T_{хр}$	$05^ч37^м43^c$	$05^ч37^м43^c$	$05^ч37^м43^c$
№ *w*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	$5^ч35^м$	02.01	$T_{гр}$	$05^ч35^м28^c$	$05^ч35^м28^c$	$05^ч35^м28^c$
Ежедн. табл→			*GHA*	254°05,1′	173°46,3′	217°23,3′
Increments & Corrections→			Corr. (minutes)	08°52,0′	08°27,8′	08°52,0′
Increments & Corrections→			V corr.	-	(+16,1) +9,5′	(-0,6) -0,4′
			*GHA**	262°57,1′	182°23,6′	226°14,9′
			λw	-148°30,5′	-148°30,5′	-148°30,5′
Обыкновенный счет→			*LHA*	114°26,6′W	33°53,1′ W	77°44,4′ W
Практический счет→			*LHA*	Такой же, т.к.<180°		
Ежедн. табл→			*Dec*			
Increments & Corrections→			d corr.			
			Dec			

DECLINATION И D CORRECTION

На ежедневных страницах альманаха, на текущую дату 02.01.2020 находим Declination и D correction для Солнца, для Луны и для Венеры (следующий слайд).



2020 January 01 to Jan. 03

h — Sun — Moon

Wed	GHA	Dec	GHA	ν	Dec	d	HP
0	179°13.7	S23°03.5	110°56.9	15.3′	S09°58.5	10.7′	54.3′
1	194°13.4	03.3	125°31.3	15.4′	09°47.8	10.7′	54.3′
2	209°13.1	03.1	140°05.7	15.4′	09°37.1	10.7′	54.3′
3	224°12.8	·· 03.0	154°40.1	15.5′	09°26.3	10.8′	54.3′
4	239°12.5	02.8	169°14.6	15.5′	09°15.5	10.8′	54.3′
5	254°12.2	02.6	183°49.1	15.5′	09°04.7	10.8′	54.2′
6	269°11.9	S23°02.4	198°23.6	15.6′	S08°53.8	10.9′	54.2′
7	284°11.6	02.2	212°58.2	15.6′	08°42.9	10.9′	54.2′
8	299°11.3	02.0	227°32.8	15.6′	08°32.0	10.9′	54.2′
9	314°11.0	·· 01.8	242°07.5	15.7′	08°21.0	11.0′	54.2′
10	329°10.7	01.6	256°42.2	15.7′	08°10.0	11.0′	54.2′
11	344°10.4	01.4	271°16.9	15.7′	07°59.0	11.0′	54.2′
12	359°10.1	S23°01.2	285°51.7	15.8′	S07°48.0	11.1′	54.2′
13	14°09.8	01.0	300°26.4	15.8′	07°36.9	11.1′	54.2′
14	29°09.5	00.8	315°01.2	15.8′	07°25.8	11.1′	54.2′
15	44°09.2	·· 00.6	329°36.1	15.9′	07°14.7	11.1′	54.2′
16	59°08.9	00.4	344°10.9	15.9′	07°03.5	11.2′	54.2′
17	74°08.6	00.2	358°45.8	15.9′	06°52.3	11.2′	54.2′
18	89°08.3	S23°00.0	13°20.7	15.9′	S06°41.1	11.2′	54.2′
19	104°08.0	22°59.7	27°55.7	16.0′	06°29.9	11.2′	54.2′
20	119°07.7	59.5	42°30.7	16.0′	06°18.7	11.3′	54.2′
21	134°07.5	·· 59.3	57°05.6	16.0′	06°07.4	11.3′	54.2′
22	149°07.2	59.1	71°40.6	16.0′	05°56.1	11.3′	54.2′
23	164°06.9	58.9	86°15.7	16.0′	05°44.8	11.3′	54.2′
	SD.=16.3	d=0.2	S.D.=14.8				

Thu	GHA	Dec	GHA	ν	Dec	d	HP
0	179°06.6	S22°58.7	100°50.7	16.1′	S05°33.4	11.3′	54.2′
1	194°06.3	58.5	115°25.8	16.1′	05°22.1	11.4′	54.2′
2	209°06.0	58.3	130°00.9	16.1′	05°10.7	11.4′	54.2′
3	224°05.7	·· 58.1	144°36.0	16.1′	04°59.3	11.4′	54.2′
4	239°05.4	57.9	159°11.1	16.1′	04°47.9	11.4′	54.2′
5	254°05.1	57.6	173°46.3	16.1′	04°36.5	11.4′	54.2′
6	269°04.8	S22°57.4	188°21.4	16.2′	S04°25.0	11.5′	54.2′
7	284°04.5	57.2	202°56.6	16.2′	04°13.5	11.5′	54.2′
8	299°04.2	57.0	217°31.7	16.2′	04°02.1	11.5′	54.2′
9	314°03.9	·· 56.8	232°06.9	16.2′	03°50.6	11.5′	54.2′
10	329°03.6	56.6	246°42.1	16.2′	03°39.0	11.5′	54.2′
11	344°03.3	56.3	261°17.3	16.2′	03°27.5	11.5′	54.2′
12	359°03.0	S22°56.1	275°52.6	16.2′	S03°16.0	11.5′	54.2′
13	14°02.8	55.9	290°27.8	16.2′	03°04.4	11.6′	54.2′
14	29°02.5	55.7	305°03.0	16.2′	02°52.8	11.6′	54.2′
15	44°02.2	·· 55.5	319°38.3	16.2′	02°41.3	11.6′	54.2′
16	59°01.9	55.2	334°13.5	16.2′	02°29.7	11.6′	54.2′
17	74°01.6	55.0	348°48.8	16.3′	02°18.1	11.6′	54.2′
18	89°01.3	S22°54.8	3°24.0	16.3′	S02°06.5	11.6′	54.2′
19	104°01.0	54.6	17°59.3	16.3′	01°54.8	11.6′	54.2′
20	119°00.7	54.3	32°34.5	16.3′	01°43.2	11.6′	54.2′
21	134°00.4	·· 54.1	47°09.8	16.3′	01°31.6	11.6′	54.2′
22	149°00.1	53.9	61°45.0	16.3′	01°19.9	11.7′	54.2′
23	163°59.8	53.7	76°20.3	16.3′	01°08.2	11.7′	54.3′
	SD.=16.3	d=0.2	S.D.=14.8				

Lat.	Twilight Naut.	Twilight Civil	Sunrise	Sunset	Twilight Civil	Twilight Naut.
N 72°	08:23	10:41	▬	▬	13:27	15:45
N 70°	08:05	09:49	▬	▬	14:19	16:03
68°	07:50	09:16	▬	▬	14:52	16:18
66°	07:37	08:53	10:27	13:41	15:15	16:31
64°	07:26	08:34	09:49	14:19	15:34	16:41
62°	07:17	08:18	09:23	14:45	15:49	16:51
60°	07:09	08:05	09:02	15:06	16:02	16:59
N 58°	07:02	07:54	08:45	15:23	16:14	17:06
56°	06:56	07:44	08:31	15:37	16:24	17:12
54°	06:50	07:35	08:19	15:49	16:32	17:18
52°	06:44	07:28	08:08	16:00	16:40	17:24
50°	06:39	07:20	07:58	16:09	16:47	17:29
45°	06:28	07:05	07:38	16:29	17:03	17:40
N 40°	06:18	06:52	07:22	16:46	17:16	17:50
35°	06:08	06:40	07:08	17:00	17:28	17:59
30°	06:00	06:30	06:56	17:12	17:38	18:08
20°	05:44	06:11	06:35	17:32	17:56	18:24
N 10°	05:28	05:54	06:17	17:50	18:13	18:40
0°	05:11	05:38	06:00	18:08	18:30	18:56
S 10°	04:53	05:20	05:43	18:25	18:48	19:15
20°	04:31	05:00	05:24	18:43	19:08	19:37
30°	04:02	04:35	05:03	19:05	19:32	20:05
35°	03:44	04:20	04:50	19:17	19:47	20:23
40°	03:21	04:03	04:35	19:32	20:05	20:46
45°	02:52	03:41	04:18	19:50	20:27	21:15
S 50°	02:08	03:12	03:56	20:11	20:55	21:59
52°	01:42	02:57	03:45	20:22	21:10	22:24
54°	01:02	02:40	03:33	20:34	21:27	23:03
56°	▭	02:19	03:20	20:47	21:48	▭
58°	▭	01:51	03:03	21:04	22:15	▭
S 60°	▭	01:08	02:44	21:23	22:58	▭

Lat.	Moonrise Wed	Moonrise Thu	Moonrise Fri	Moonset Wed	Moonset Thu	Moonset Fri
N 72°	12:37	12:18	12:00	21:58	23:43	–:–
N 70°	12:26	12:13	12:02	22:06	23:44	–:–
68°	12:17	12:10	12:03	22:14	23:45	–:–
66°	12:09	12:07	12:04	22:20	23:46	–:–
64°	12:02	12:04	12:05	22:25	23:47	–:–
62°	11:57	12:02	12:06	22:29	23:48	–:–
60°	11:52	12:00	12:07	22:33	23:49	–:–
N 58°	11:48	11:58	12:08	22:36	23:49	–:–
56°	11:44	11:56	12:08	22:39	23:50	–:–
54°	11:40	11:55	12:09	22:42	23:50	–:–
52°	11:37	11:54	12:10	22:44	23:51	–:–
50°	11:34	11:52	12:10	22:46	23:51	–:–
45°	11:28	11:50	12:11	22:51	23:52	–:–
N 40°	11:23	11:48	12:12	22:55	23:52	–:–
35°	11:18	11:46	12:13	22:58	23:53	–:–
30°	11:14	11:44	12:14	23:01	23:54	–:–
20°	11:07	11:41	12:15	23:06	23:54	–:–

DECLINATION И D CORRECTION

На ежедневных страницах альманаха, на текущую дату 02.01.2020 находим Declination и D correction для Венеры.

January 01, 02, 03 (Wed., Thu., Fri.)

	Aries	Venus		Mars		Jupiter		Saturn	
Wed	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	100°07.0	142°40.8	S18°15.9	223°53.4	S19°26.7	182°51.5	S23°10.8	167°00.1	S21°41.1
1	115°09.5	157°40.2	15.0	238°54.2	27.1	197°53.3	10.8	182°02.3	41.0
2	130°11.9	172°39.6	14.1	253°54.9	27.5	212°55.1	10.7	197°04.4	41.0
3	145°14.4	187°39.0	·· 13.2	268°55.6	·· 27.9	227°57.0	·· 10.7	212°06.6	·· 40.9
4	160°16.9	202°38.4	12.2	283°56.4	28.3	242°58.8	10.7	227°08.7	40.9
5	175°19.3	217°37.7	11.3	298°57.1	28.7	258°00.7	10.7	242°10.9	40.8
6	190°21.8	232°37.1	S18°10.4	313°57.8	S19°29.1	273°02.5	S23°10.6	257°13.0	S21°40.8
7	205°24.3	247°36.5	09.5	328°58.5	29.5	288°04.3	10.6	272°15.2	40.8
8	220°26.7	262°35.9	08.6	343°59.3	29.9	303°06.2	10.6	287°17.3	40.7
9	235°29.2	277°35.3	·· 07.6	359°00.0	·· 30.3	318°08.0	·· 10.6	302°19.5	·· 40.7
10	250°31.7	292°34.7	06.7	14°00.7	30.6	333°09.8	10.5	317°21.6	40.6
11	265°34.1	307°34.1	05.8	29°01.5	31.0	348°11.7	10.5	332°23.8	40.6
12	280°36.6	322°33.5	S18°04.8	44°02.2	S19°31.4	3°13.5	S23°10.5	347°26.0	S21°40.5
13	295°39.0	337°32.9	03.9	59°02.9	31.8	18°15.4	10.5	2°28.1	40.5
14	310°41.5	352°32.3	03.0	74°03.6	32.2	33°17.2	10.4	17°30.3	40.5
15	325°44.0	7°31.7	·· 02.1	89°04.4	·· 32.6	48°19.0	·· 10.4	32°32.4	·· 40.4
16	340°46.4	22°31.1	01.1	104°05.1	33.0	63°20.9	10.4	47°34.6	40.4
17	355°48.9	37°30.5	18°00.2	119°05.8	33.4	78°22.7	10.4	62°36.7	40.3
18	10°51.4	52°29.9	S17°59.3	134°06.6	S19°33.8	93°24.6	S23°10.3	77°38.9	S21°40.3
19	25°53.8	67°29.3	58.3	149°07.3	34.2	108°26.4	10.3	92°41.0	40.2
20	40°56.3	82°28.7	57.4	164°08.0	34.6	123°28.2	10.3	107°43.2	40.2
21	55°58.8	97°28.1	·· 56.5	179°08.7	·· 35.0	138°30.1	·· 10.2	122°45.3	·· 40.2
22	71°01.2	112°27.5	55.5	194°09.5	35.3	153°31.9	10.2	137°47.5	40.1
23	86°03.7	127°26.9	54.6	209°10.2	35.7	168°33.7	10.2	152°49.6	40.1
Mer.pass.:17:17		v-0.6 d0.9 m-3.9		v0.7 d-0.4 m1.6		v1.8 d0.0 m-1.7		v2.2 d0.0 m0.6	

Thu	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	101°06.1	142°26.3	S17°53.7	224°10.9	S19°36.1	183°35.6	S23°10.2	167°51.8	S21°40.0
1	116°08.6	157°25.7	52.7	239°11.7	36.5	198°37.4	10.1	182°53.9	40.0
2	131°11.1	172°25.1	51.8	254°12.4	36.9	213°39.3	10.1	197°56.1	39.9
3	146°13.5	187°24.5	·· 50.8	269°13.1	·· 37.3	228°41.1	·· 10.1	212°58.2	·· 39.9
4	161°16.0	202°23.9	49.9	284°13.8	37.7	243°42.9	10.1	228°00.4	39.9
5	176°18.5	217°23.3	49.0	299°14.6	38.1	258°44.8	10.0	243°02.5	39.8
6	191°20.9	232°22.7	S17°48.0	314°15.3	S19°38.5	273°46.6	S23°10.0	258°04.7	S21°39.8
7	206°23.4	247°22.1	47.1	329°16.0	38.8	288°48.4	10.0	273°06.8	39.7
8	221°25.9	262°21.5	46.1	344°16.7	39.2	303°50.3	10.0	288°09.0	39.7
9	236°28.3	277°20.9	·· 45.2	359°17.5	·· 39.6	318°52.1	·· 09.9	303°11.1	·· 39.6
10	251°30.8	292°20.3	44.2	14°18.2	40.0	333°54.0	09.9	318°13.3	39.6
11	266°33.3	307°19.7	43.3	29°18.9	40.4	348°55.8	09.9	333°15.5	39.5
12	281°35.7	322°19.1	S17°42.3	44°19.6	S19°40.8	3°57.6	S23°09.9	348°17.6	S21°39.5
13	296°38.2	337°18.6	41.4	59°20.4	41.2	18°59.5	09.8	3°19.8	39.5
14	311°40.6	352°18.0	40.4	74°21.1	41.6	34°01.3	09.8	18°21.9	39.4
15	326°43.1	7°17.4	·· 39.5	89°21.8	·· 41.9	49°03.2	·· 09.8	33°24.1	·· 39.4
16	341°45.6	22°16.8	38.5	104°22.5	42.3	64°05.0	09.7	48°26.2	39.3
17	356°48.0	37°16.2	37.6	119°23.3	42.7	79°06.8	09.7	63°28.4	39.3
18	11°50.5	52°15.6	S17°36.6	134°24.0	S19°43.1	94°08.7	S23°09.7	78°30.5	S21°39.2
19	26°53.0	67°15.0	35.7	149°24.7	43.5	109°10.5	09.7	93°32.7	39.2
20	41°55.4	82°14.4	34.7	164°25.4	43.9	124°12.4	09.6	108°34.8	39.2
21	56°57.9	97°13.9	·· 33.8	179°26.2	·· 44.2	139°14.2	·· 09.6	123°37.0	·· 39.1
22	72°00.4	112°13.3	32.8	194°26.9	44.6	154°16.0	09.6	138°39.1	39.1
23	87°02.8	127°12.7	31.9	209°27.6	45.0	169°17.9	09.6	153°41.3	39.0
Mer.pass.:17:13		v-0.6 d0.9 m-3.9		v0.7 d-0.4 m1.6		v1.8 d0.0 m-1.7		v2.2 d0.0 m0.6	

РАСЧЕТ ПО NAUTICAL ALMANAC

Записываем значения в таблицу.

				Sun	*Moon*	*Venus*
T_c	19ч35м	01.01	$T_{хр}$	05ч37м43с	05ч37м43с	05ч37м43с
№ *w*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	5ч35м	02.01	$T_{гр}$	05ч35м28с	05ч35м28с	05ч35м28с
	Ежедн. табл→		*GHA*	254°05,1′	173°46,3′	217°23,3′
	Increments & Corrections→		Corr. (minutes)	08°52,0′	08°27,8′	08°52,0′
	Increments & Corrections→		V corr.	-	(+16,1) +9,5′	(-0,6) -0,4′
			*GHA**	262°57,1′	182°23,6′	226°14,9′
			λw	-148°30,5′	-148°30,5′	-148°30,5′
	Обыкновенный счет→		*LHA*	114°26,6′W	33°53,1′ W	77°44,4′ W
	Практический счет→		*LHA*	Такой же, т.к.<180°		
	Ежедн. табл→		*Dec*	22°57,6′ S	04°36,5′ S	17°49,0′ S
	Increments & Corrections→		d corr.	(+0.2)	(+11.4)	(+0.9)
			Dec			

ЗНАЧЕНИЯ D CORRECTION

На последних страницах альманаха находим в Increments and corrections значения d correction на минуту по Тгр (35м).

Increments and Corrections

	Aries	Moon	v and d corr			m 35	Sun Plan.	Aries	Moon	v and d corr		
0	8°31.4	8°06.8	0.0 - 0.0	6.0 - 3.4	12.0 - 6.9	0	8°45.0	8°46.4	8°21.1	0.0 - 0.0	6.0 - 3.5	12.0 - 7.1
2	8°31.6	8°07.0	0.1 - 0.1	6.1 - 3.5	12.1 - 7.0	1	8°45.2	8°46.7	8°21.3	0.1 - 0.1	6.1 - 3.6	12.1 - 7.2
5	8°31.9	8°07.2	0.2 - 0.1	6.2 - 3.6	12.2 - 7.0	2	8°45.5	8°46.9	8°21.6	0.2 - 0.1	6.2 - 3.7	12.2 - 7.2
7	8°32.1	8°07.5	0.3 - 0.2	6.3 - 3.6	12.3 - 7.1	3	8°45.7	8°47.2	8°21.8	0.3 - 0.2	6.3 - 3.7	12.3 - 7.3
0	8°32.4	8°07.7	0.4 - 0.2	6.4 - 3.7	12.4 - 7.1	4	8°46.0	8°47.4	8°22.0	0.4 - 0.2	6.4 - 3.8	12.4 - 7.3
3	8°32.6	8°08.0	0.5 - 0.3	6.5 - 3.7	12.5 - 7.2	5	8°46.3	8°47.7	8°22.3	0.5 - 0.3	6.5 - 3.8	12.5 - 7.4
5	8°32.9	8°08.2	0.6 - 0.3	6.6 - 3.8	12.6 - 7.2	6	8°46.5	8°47.9	8°22.5	0.6 - 0.4	6.6 - 3.9	12.6 - 7.5
8	8°33.1	8°08.4	0.7 - 0.4	6.7 - 3.9	12.7 - 7.3	7	8°46.8	8°48.2	8°22.8	0.7 - 0.4	6.7 - 4.0	12.7 - 7.5
0	8°33.4	8°08.7	0.8 - 0.5	6.8 - 3.9	12.8 - 7.4	8	8°47.0	8°48.4	8°23.0	0.8 - 0.5	6.8 - 4.0	12.8 - 7.6
2	8°33.7	8°08.9	0.9 - 0.5	6.9 - 4.0	12.9 - 7.4	9	8°47.2	8°48.7	8°23.2	0.9 - 0.5	6.9 - 4.1	12.9 - 7.6
5	8°33.9	8°09.2	1.0 - 0.6	7.0 - 4.0	13.0 - 7.5	10	8°47.5	8°48.9	8°23.5	1.0 - 0.6	7.0 - 4.1	13.0 - 7.7
7	8°34.2	8°09.4	1.1 - 0.6	7.1 - 4.1	13.1 - 7.5	11	8°47.7	8°49.2	8°23.7	1.1 - 0.7	7.1 - 4.2	13.1 - 7.8
0	8°34.4	8°09.6	1.2 - 0.7	7.2 - 4.1	13.2 - 7.6	12	8°48.0	8°49.4	8°23.9	1.2 - 0.7	7.2 - 4.3	13.2 - 7.8
3	8°34.7	8°09.9	1.3 - 0.7	7.3 - 4.2	13.3 - 7.6	13	8°48.3	8°49.7	8°24.2	1.3 - 0.8	7.3 - 4.3	13.3 - 7.9
5	8°34.9	8°10.1	1.4 - 0.8	7.4 - 4.3	13.4 - 7.7	14	8°48.5	8°49.9	8°24.4	1.4 - 0.8	7.4 - 4.4	13.4 - 7.9
8	8°35.2	8°10.3	1.5 - 0.9	7.5 - 4.3	13.5 - 7.8	15	8°48.8	8°50.2	8°24.7	1.5 - 0.9	7.5 - 4.4	13.5 - 8.0
0	8°35.4	8°10.6	1.6 - 0.9	7.6 - 4.4	13.6 - 7.8	16	8°49.0	8°50.4	8°24.9	1.6 - 0.9	7.6 - 4.5	13.6 - 8.0
2	8°35.7	8°10.8	1.7 - 1.0	7.7 - 4.4	13.7 - 7.9	17	8°49.2	8°50.7	8°25.1	1.7 - 1.0	7.7 - 4.6	13.7 - 8.1
5	8°35.9	8°11.1	1.8 - 1.0	7.8 - 4.5	13.8 - 7.9	18	8°49.5	8°50.9	8°25.4	1.8 - 1.1	7.8 - 4.6	13.8 - 8.2
8	8°36.2	8°11.3	1.9 - 1.1	7.9 - 4.5	13.9 - 8.0	19	8°49.8	8°51.2	8°25.6	1.9 - 1.1	7.9 - 4.7	13.9 - 8.2
0	8°36.4	8°11.5	2.0 - 1.1	8.0 - 4.6	14.0 - 8.0	20	8°50.0	8°51.4	8°25.9	2.0 - 1.2	8.0 - 4.7	14.0 - 8.3
3	8°36.7	8°11.8	2.1 - 1.2	8.1 - 4.7	14.1 - 8.1	21	8°50.3	8°51.7	8°26.1	2.1 - 1.2	8.1 - 4.8	14.1 - 8.3
5	8°36.9	8°12.0	2.2 - 1.3	8.2 - 4.7	14.2 - 8.2	22	8°50.5	8°52.0	8°26.3	2.2 - 1.3	8.2 - 4.9	14.2 - 8.4
7	8°37.2	8°12.3	2.3 - 1.3	8.3 - 4.8	14.3 - 8.2	23	8°50.7	8°52.2	8°26.6	2.3 - 1.4	8.3 - 4.9	14.3 - 8.5
0	8°37.4	8°12.5	2.4 - 1.4	8.4 - 4.8	14.4 - 8.3	24	8°51.0	8°52.5	8°26.8	2.4 - 1.4	8.4 - 5.0	14.4 - 8.5
2	8°37.7	8°12.7	2.5 - 1.4	8.5 - 4.9	14.5 - 8.3	25	8°51.2	8°52.7	8°27.0	2.5 - 1.5	8.5 - 5.0	14.5 - 8.6
5	8°37.9	8°13.0	2.6 - 1.5	8.6 - 4.9	14.6 - 8.4	26	8°51.5	8°53.0	8°27.3	2.6 - 1.5	8.6 - 5.1	14.6 - 8.6
8	8°38.2	8°13.2	2.7 - 1.6	8.7 - 5.0	14.7 - 8.5	27	8°51.8	8°53.2	8°27.5	2.7 - 1.6	8.7 - 5.1	14.7 - 8.7
0	8°38.4	8°13.4	2.8 - 1.6	8.8 - 5.1	14.8 - 8.5	28	8°52.0	8°53.5	8°27.8	2.8 - 1.7	8.8 - 5.2	14.8 - 8.8
3	8°38.7	8°13.7	2.9 - 1.7	8.9 - 5.1	14.9 - 8.6	29	8°52.3	8°53.7	8°28.0	2.9 - 1.7	8.9 - 5.3	14.9 - 8.8
5	8°38.9	8°13.9	3.0 - 1.7	9.0 - 5.2	15.0 - 8.6	30	8°52.5	8°54.0	8°28.2	3.0 - 1.8	9.0 - 5.3	15.0 - 8.9
7	8°39.2	8°14.2	3.1 - 1.8	9.1 - 5.2	15.1 - 8.7	31	8°52.7	8°54.2	8°28.5	3.1 - 1.8	9.1 - 5.4	15.1 - 8.9
0	8°39.4	8°14.4	3.2 - 1.8	9.2 - 5.3	15.2 - 8.7	32	8°53.0	8°54.5	8°28.7	3.2 - 1.9	9.2 - 5.4	15.2 - 9.0
2	8°39.7	8°14.6	3.3 - 1.9	9.3 - 5.3	15.3 - 8.8	33	8°53.2	8°54.7	8°29.0	3.3 - 2.0	9.3 - 5.5	15.3 - 9.1
5	8°39.9	8°14.9	3.4 - 2.0	9.4 - 5.4	15.4 - 8.9	34	8°53.5	8°55.0	8°29.2	3.4 - 2.0	9.4 - 5.6	15.4 - 9.1
8	8°40.2	8°15.1	3.5 - 2.0	9.5 - 5.5	15.5 - 8.9	35	8°53.8	8°55.2	8°29.4	3.5 - 2.1	9.5 - 5.6	15.5 - 9.2
0	8°40.4	8°15.4	3.6 - 2.1	9.6 - 5.5	15.6 - 9.0	36	8°54.0	8°55.5	8°29.7	3.6 - 2.1	9.6 - 5.7	15.6 - 9.2
3	8°40.7	8°15.6	3.7 - 2.1	9.7 - 5.6	15.7 - 9.0	37	8°54.3	8°55.7	8°29.9	3.7 - 2.2	9.7 - 5.7	15.7 - 9.3
5	8°40.9	8°15.8	3.8 - 2.2	9.8 - 5.6	15.8 - 9.1	38	8°54.5	8°56.0	8°30.2	3.8 - 2.2	9.8 - 5.8	15.8 - 9.3
7	8°41.2	8°16.1	3.9 - 2.2	9.9 - 5.7	15.9 - 9.1	39	8°54.7	8°56.2	8°30.4	3.9 - 2.3	9.9 - 5.9	15.9 - 9.4
0	8°41.4	8°16.3	4.0 - 2.3	10.0 - 5.8	16.0 - 9.2	40	8°55.0	8°56.5	8°30.6	4.0 - 2.4	10.0 - 5.9	16.0 - 9.5
2	8°41.7	8°16.5	4.1 - 2.4	10.1 - 5.8	16.1 - 9.3	41	8°55.2	8°56.7	8°30.9	4.1 - 2.4	10.1 - 6.0	16.1 - 9.5
5	8°41.9	8°16.8	4.2 - 2.4	10.2 - 5.9	16.2 - 9.3	42	8°55.5	8°57.0	8°31.1	4.2 - 2.5	10.2 - 6.0	16.2 - 9.6
8	8°42.2	8°17.0	4.3 - 2.5	10.3 - 5.9	16.3 - 9.4	43	8°55.8	8°57.2	8°31.3	4.3 - 2.5	10.3 - 6.1	16.3 - 9.6
0	8°42.4	8°17.3	4.4 - 2.5	10.4 - 6.0	16.4 - 9.4	44	8°56.0	8°57.5	8°31.6	4.4 - 2.6	10.4 - 6.2	16.4 - 9.7
3	8°42.7	8°17.5	4.5 - 2.6	10.5 - 6.0	16.5 - 9.5	45	8°56.3	8°57.7	8°31.8	4.5 - 2.7	10.5 - 6.2	16.5 - 9.8
5	8°42.9	8°17.7	4.6 - 2.6	10.6 - 6.1	16.6 - 9.5	46	8°56.5	8°58.0	8°32.1	4.6 - 2.7	10.6 - 6.3	16.6 - 9.8
7	8°43.2	8°18.0	4.7 - 2.7	10.7 - 6.2	16.7 - 9.6	47	8°56.7	8°58.2	8°32.3	4.7 - 2.8	10.7 - 6.3	16.7 - 9.9
0	8°43.4	8°18.2	4.8 - 2.8	10.8 - 6.2	16.8 - 9.7	48	8°57.0	8°58.5	8°32.5	4.8 - 2.8	10.8 - 6.4	16.8 - 9.9
3	8°43.7	8°18.5	4.9 - 2.8	10.9 - 6.3	16.9 - 9.7	49	8°57.3	8°58.7	8°32.8	4.9 - 2.9	10.9 - 6.4	16.9 - 10.0
5	8°43.9	8°18.7	5.0 - 2.9	11.0 - 6.3	17.0 - 9.8	50	8°57.5	8°59.0	8°33.0	5.0 - 3.0	11.0 - 6.5	17.0 - 10.1
8	8°44.2	8°18.9	5.1 - 2.9	11.1 - 6.4	17.1 - 9.8	51	8°57.8	8°59.2	8°33.3	5.1 - 3.0	11.1 - 6.6	17.1 - 10.1
0	8°44.4	8°19.2	5.2 - 3.0	11.2 - 6.4	17.2 - 9.9	52	8°58.0	8°59.5	8°33.5	5.2 - 3.1	11.2 - 6.6	17.2 - 10.2
2	8°44.7	8°19.4	5.3 - 3.0	11.3 - 6.5	17.3 - 9.9	53	8°58.2	8°59.7	8°33.7	5.3 - 3.1	11.3 - 6.7	17.3 - 10.2
5	8°44.9	8°19.7	5.4 - 3.1	11.4 - 6.6	17.4 - 10.0	54	8°58.5	9°00.0	8°34.0	5.4 - 3.2	11.4 - 6.7	17.4 - 10.3
7	8°45.2	8°19.9	5.5 - 3.2	11.5 - 6.6	17.5 - 10.1	55	8°58.7	9°00.2	8°34.2	5.5 - 3.3	11.5 - 6.8	17.5 - 10.4

Записываем значения в таблицу

И выполняем расчет.

				Sun	*Moon*	*Venus*
T_c	19ч35м	01.01	$T_{хр}$	05ч37м43с	05ч37м43с	05ч37м43с
№ *W*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	5ч35м	02.01	$T_{гр}$	05ч35м28с	05ч35м28с	05ч35м28с
	Ежедн. табл→		*GHA*	254°05,1′	173°46,3′	217°23,3′
	Increments & Corrections→		Corr. (minutes)	08°52,0′	08°27,8′	08°52,0′
	Increments & Corrections→		V corr.	-	(+16,1) +9,5′	(-0,6) -0,4′
			*GHA**	262°57,1′	182°23,6′	226°14,9′
			λw	-148°30,5′	-148°30,5′	-148°30,5′
	Обыкновенный счет→		*LHA*	114°26,6′W	33°53,1′ W	77°44,4′ W
	Практический счет→		*LHA*	Такой же, т.к.<180°		
	Ежедн. табл→		*Dec*	22°57,6′ S	04°36,5′ S	17°49,0′ S
	Increments & Corrections→		d corr.	(+0.2)+0,1′	(+11.4) +6,7′	(+0.9) +0,5′
			Dec	22°57,7′S	04°43,2′ S	17°49,5′ S

ОТВЕТ:

				Sun	*Moon*	*Venus*
T_c	19ч35м	01.01	$T_{хр}$	05ч37м43с	05ч37м43с	05ч37м43с
№ *w*	+10		$U_{хр}$	-2 15	-2 15	-2 15
$T_{гр}$	5ч35м	02.01	$T_{гр}$	05ч35м28с	05ч35м28с	05ч35м28с
	Ежедн. табл→		*GHA*	254°05,1′	173°46,3′	217°23,3′
	Increments & Corrections→		Corr. (minutes)	08°52,0′	08°27,8′	08°52,0′
	Increments & Corrections→		V corr.	-	(+16,1) +9,5′	(-0,6) -0,4′
			*GHA**	262°57,1′	182°23,6′	226°14,9′
			λw	-148°30,5′	-148°30,5′	-148°30,5′
	Обыкновенный счет→		*LHA*	**114°26,6′W**	**33°53,1′ W**	**77°44,4′ W**
	Практический счет→		*LHA*	Такой же, т.к.<180°		
	Ежедн. табл→		*Dec*	22°57,6′ S	04°36,5′ S	17°49,0′ S
	Increments & Corrections→		d corr.	(+0.2)+0,1′	(+11.4) +6,7′	(+0.9) +0,5′
			Dec	**22°57,7′S**	**04°43,2′ S**	**17°49,5′ S**