

CALCULATIONS FOR THE MOON VARIATION VS SOLAR YEAR LENGTH

Solar Year (aka Tropical Year, or Year of the Seasons) is the time between two successive occurrences of the vernal equinox (day and night are \approx equal in length).

Solar Year Length is \approx 365 days, 5 hours, 48 minutes, 46 seconds or 365.2422 days.

[1 hour = 3600 seconds (60 seconds x 60 minutes)]

[1 day = 86,400 seconds (3600 x 24)]

[5 hours = 18,000 seconds (3600 x 5 = 18,000)]

[48 minutes = 2,880 seconds (48 x 60)]

Adding up all the seconds: 18,000 + 2,880 + 46 = 20,926 seconds.

20,926 divided by 86,400 = 2.4219907 or .2422

Moon Cycle (aka lunar cycle, lunation, lunar month, or synodic month) is the span of time between one new moon and the next. On **average** this is **29.53059** days.

The following is for the variance between the solar year length of 365.2422 days and the length of the moon cycle of 29.53059 days.

Time in days for the **first solar nineteen years** is $19 \times 365.2422 = 6939.6018$. [Chart 6, page 1 upper left-hand corner—**6939**, picture below.]

Total Days HCC (Moon) & SC					
	Year	TD HCC	Lag	TD SC	
1	19	6939		6939	
2	38	6941	-1	6940	
3	57	6940	-1	6940	
4	76	6939		6940	
5	95	6939		6939	
6	114	6940		6940	
7	133	6941	-2	6939	128*
8	152	6940	-2	6940	
9	171	6939	-2	6939	
10	190	6939	-1	6940	
11	209	6940	-1	6940	
12	228	6939		6940	
13	247	6940	-1	6939	
	Totals	90216		90215	
		2.0844x13/24=(1.129)			

The number of months (moon cycles) for the same nineteen-year period is $19 \times 12 = 228$. Add seven months for the 13-month years. $228 + 7 = 235$ [There are 12 years with 12 months, and 7 years of 13 months in every 19-year cycle.]

The number of days in the **first 235 months** is $235 \times 29.53059 = 6939.68865$. 6939.68865 minus $6939.6018 = 0.08685$ of a day for each nineteen years.

At the end of 13 nineteen-year cycles there are $13 \times .08685 = 1.12905$ days that the moon has traveled past the alignment between the sun and the earth. This is what Chart 6 shows at the bottom of the first thirteen nineteen-year time cycles.

1st 19 years: $6939 \div 29.53059 = 234.97668 \approx 235$; 2nd 19 years: $6941 \div 29.53059 = 235.0444 \approx 235$

1st 247 years: $90216 \div 29.53059 = 3055.0016$; $[235 \times 13 = 3055]$ —no time lost or added.

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