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Round **Pr**

Group **α**

язык / language	English

Practical round

α-7. Cepheid. We observe a Cepheid variable in V band using 60 cm telescope at Sobeak Mt Observatory, Korea. The observed magnitudes m_v vs Julian day are listed in the table on the right.

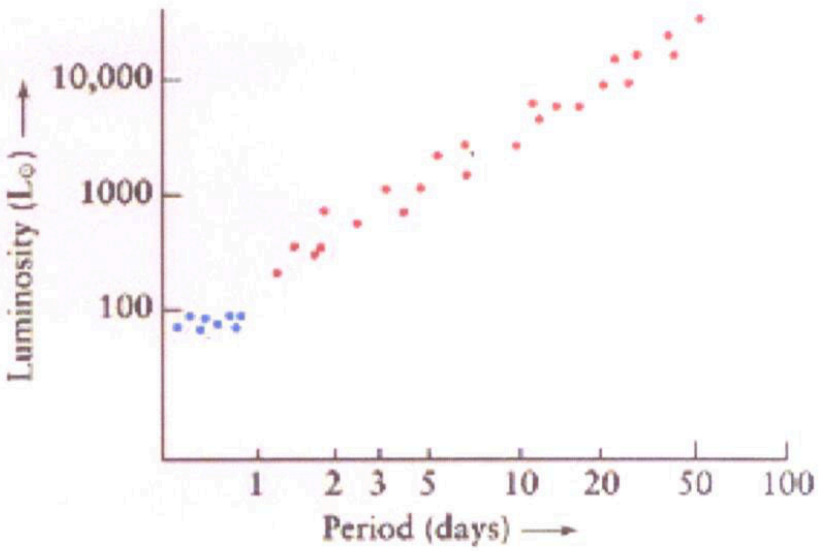
m_v	JD				
4.74	405.3	6.09	416.6	5.43	435.6
4.95	408.7	5.99	420.4	5.48	436.4
5.05	409.9	5.20	423.4	5.80	438.2
5.28	411.6	4.73	425.6	6.15	440.7
5.66	414.2	4.83	429.8	6.13	443.3
6.00	415.9	4.88	431.0	5.54	444.9
		5.20	434.0	5.05	447.0

7.1. Draw in your copy-book the light curve (graph of stellar magnitude vs time) of this Cepheid variable with x axis in Julian days.

7.2. Determine the period of the Cepheid variable.

7.3. Draw the light curve in phase (fraction of period).

7.4. Determine the Luminosity of the Cepheid variable, using the Period-Luminosity Relation for Cepheid Variables of Figure (luminosity is done in solar luminosities).



7.5. Given that the absolute magnitude of the Sun is $M_v = 4.7^m$, determine the distance to the Cepheid (neglecting the interstellar extinctions).

α-8. Venus. The table shows the setting time of the sun and Venus at Mt. Sobaek, Korea in 2009.

Date	Sun	Venus	02-Mar	18 21	21 09	11-May	19 24	15 51
01-Jan	17 20	21 04	12-Mar	18 30	20 30	21-May	19 32	15 47
11-Jan	17 29	21 19	22-Mar	18 40	19 31	31-May	19 39	15 49
21-Jan	17 39	21 30	01-Apr	18 48	18 20	10-Jun	19 45	15 56
31-Jan	17 50	21 37	11-Apr	18 57	17 17	20-Jun	19 49	16 05
10-Feb	18 01	21 37	21-Apr	19 06	16 32	30-Jun	19 50	16 17
20-Feb	18 11	21 30	01-May	19 15	16 05			

8.1. Use these data provided above to determine on the graph (see separate sheet) the dates of the greatest western elongation, the greatest eastern elongation and the inferior conjunction of Venus.

8.2. The figure (see the same separate sheet) shows the orbits of the Earth and Venus assuming that their orbits are circular. In particular, Venus is in the greatest eastern elongation. Use the data in the table above to indicate the locations of Venus and the Earth on the date of the greatest western elongation of Venus.

Figures for Problem 8.

