

29:52 Exploration of the Solar System

Homework Assignment # 3

Quiz must be completed on ICON by 8 AM, Monday, February 15

1. In class, I used two of Kepler's Laws to calculate the time it takes for a spaceship to travel from the Earth to Mars. Which two did I use?
2. Assume that the angle between the Sun and Moon (strictly speaking, the angle defined by the line segments Sun-Earth, and Earth-Moon) is 120 degrees. What phase is the Moon? (Choices are new, crescent, quarter, gibbous, and full).
3. If the obliquity of the ecliptic for the Earth were 40 degrees instead of 23.5 degrees, with all other astronomical parameters for the Earth being the same, which of the following astronomical phenomena would be different?
 - (a) the length of the sidereal day
 - (b) seasonal variations in temperature and length of daylight
 - (c) the length of the tropical year
 - (d) the average distance of the Earth from the Sun
 - (e) the band across the sky where we see the other planets
4. Kepler's 3rd Law says that there is a mathematical relationship between the period of an orbit and the
 - (a) minor axis
 - (b) orbital speed
 - (c) inclination of the orbit
 - (d) eccentricity
 - (e) semimajor axis
5. The semimajor axis of the Earth's orbit around the Sun is 1.00 astronomical units. How close is the Earth to the Sun at perihelion? **Hint:** To answer this, you need to look up data on the properties of the Earth's orbit.
 - (a) 0.98 au
 - (b) 1.00 au
 - (c) 0.87 au
 - (d) 0.72 au
 - (e) 1.43 au
6. You go outside in the early evening and see the first quarter Moon. You consult your SC1 star chart and plot the position of the Moon relative to the stars.

You see that it is exactly 5 degrees above the ecliptic. Based on this, will there be a lunar eclipse in one week? Yes (true) or No(false)?

7. The first slide in the lecture notes for Lecture 10 was a diagram showing the orbit of the solar system object Sedna. What is the eccentricity of Sedna's orbit?
 - (a) 0.00
 - (b) 0.14
 - (c) 0.33
 - (d) 0.87
 - (e) 0.99

8. Assume it is noon, apparent solar time, here in Iowa City. Now think about New York. Is the apparent solar time there morning, noon, or afternoon? Just type in the right choice (morning, afternoon, or noon).