AST 207   Homework 3   Due 24 September 2010

Answers will be put on angel at 1:01pm, Mon., 9/27. Late papers will be accepted until then.

Planet	Period (yr)	Semi-major axis (AU)	Eccentricity
Mercury	0.241	0.387	0.206
Venus	0.615	0.723	0.007
Earth	1.000	1.000	0.017
Mars	1.881	1.523	0.093
Jupiter	11.86	5.202	0.049
Saturn	29.46	9.539	0.056

1. The drawing shows the constellations of the Zodiac.

    a. (2 pt.) Place yourself on the drawing at 2am on 9/21 and at 2pm on 3/21.

    b. (5 pt.) Make a drawing of you, the earth, the sun, and Pisces at the same times and dates according to Ptolemy. (2 pts.) Show the motion that occurs in the 6 hours from 2pm on 3/21 to 8pm on 3/21.
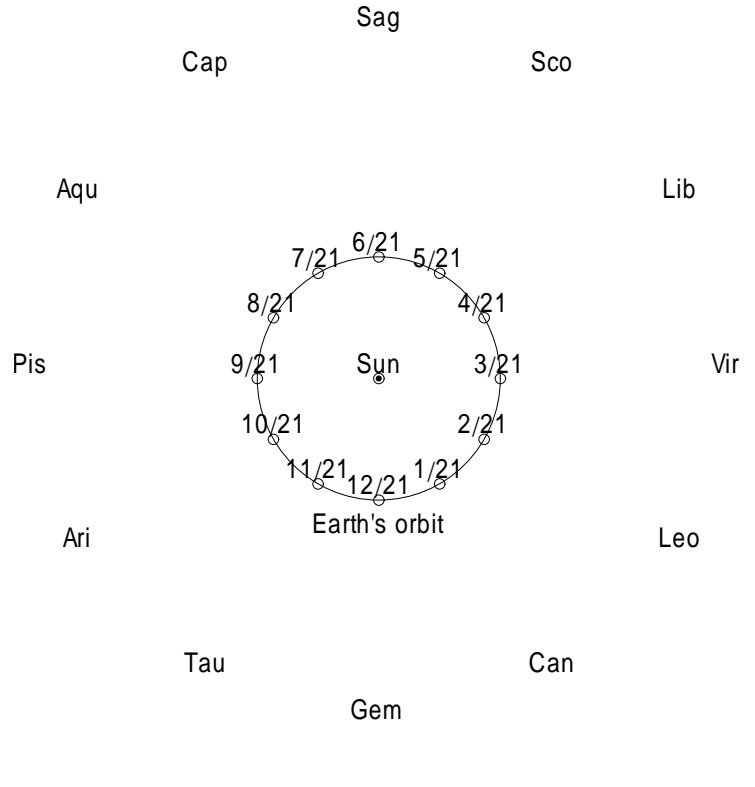
2. **A Comet** has an orbital period of 100 years, and its eccentricity is 0.967.

    a. (4 pts.) How far from the sun does it get? How close to the sun does it get? Give your answer in AU.

    b. (2 pts.) What the ratio between its fastest and slowest orbital speeds?

3. **A new planet** is found in the solar system. Its period is 36 days or 0.1 year. Assume the orbit is circular.

    a. (2 pts.) Is its orbit smaller or larger than that of Mercury around the sun? Explain how you can answer this without computing a numerical answer.

    b. (3 pts.) Compute the radius of the orbit.