Lab Preparation - Jupiter's Moons

Before the first lab session:

Read entirely the lab manual Jupiter's Moons.

Answer the following questions to check your understanding of the basic ideas.

- 1) To find the mass of an object using Kepler's Third Law, what quantities must be measured? What units must they be measured in if you want the derived mass to be in units of the mass of the Sun, or solar masses (M_0) ?
- 2) A new moon is discovered to orbit the planet Jupiter; it is given the name Mythis. Its orbital period P is 10 days and the radius of its orbit is 10 JuD. Suppose you (on Earth) were to observe and measure the separation of Jupiter and Mythis continously for <u>one</u> orbital period. In the graph below, sketch the orbit curve that you would find. At time t = 0 days Mythis is in the position shown in the figure. Let this position of Mythis correspond to positive positions in the graph.



3) Based on this moon Mythis, what is the mass of Jupiter compared to the mass of the Sun? Use the back to show your work if needed. (Note that the resulting mass is as fictional as the moon Mythis!)