Physics 1311
Spring 2020
Homework/Study 2 (two-sided)

Chapter 1

1. What will the phase of the Moon be if you see it rising at sunset? (Try drawing the Moon phase diagram.)

2. Which observed phase of Venus prove that the Ptolemaic (geocentric) model of the Solar System is wrong? Why did it do so?

3. Would a perfectly circular planet orbit agree with Kepler's laws? Explain why or why not.

4. Suppose that the obscure planet Fringus orbits 25 AU from the Sun. What is its orbital period (in Earth years)?

5. Why is the apparent retrograde (backward) motion of Mars just an illusion?

6. Why can we get away with using Kepler's laws for the planets without using the sum-of-the-masses term Newton added?

7. What is weight?

8. The Sun is at one focus of a planet's orbit, but what is at the other?

9. What does "heliocentric" mean?

10. How would the Earth move if the Sun's gravity suddenly vanished? Make a small sketch showing how it would move.

11. What does it mean to say that a force exhibits inverse square behavior?

12. This one is easier than it looks. Imagine a rocket, fully fueled, sitting on the pad. After launch the rocket's thrust is constant until the engine stops when the fuel runs out. When in the flight does the rocket experience maximum acceleration? Use Newton's F=ma relation to figure it out. No actual calculation required, but explain your reasoning.

13. Here's a balance (seesaw) problem. Two kids, one weighing 50 pounds and one weighing 80 pounds, come upon a seesaw in a park. The thing is 12 feet long, pivoting exactly in the center and having adjustable seats. The smaller kid sets his seat 5 feet from the center. How far from the center does the bigger kid have to put his seat to balance the seesaw?