HOMEWORK #2
Due: 9/8/11

Part I – Size and Scale

In our size and scale lab next week, you'll get a sense for the relative sizes of and distances between the planets in our solar system. To quantify this, let's investigate what percentage of the mass of the solar system lies in each planet. Answer each question on a separate sheet of paper and show your work to receive full credit.

Note: I have office hours from 4-5pm on Thursday. If you struggle with any of these questions, can't remember how to approach questions like this from prior math classes, or find that this first part is taking you more than one hour, STOP and come see me at office hours!

Table 1: Solar System Masses

Object	Mass
Sun	1.98892×10^{30} kg
Mercury	3.30×10^{23} kg
Venus	4.868×10^{24} kg
Earth	5.9742×10^{24} kg
Mars	6.42×10^{23} kg
Asteroid Belt	3.3×10^{21} kg
Jupiter	1.8986×10^{27} kg
Saturn	5.688×10^{26} kg
Uranus	8.68×10^{25} kg
Neptune	1.02×10^{26} kg
Kupier Belt (including Pluto!)	6×10^{23} kg

1. Using the table above, calculate the total mass of the solar system.

2. Now calculate the total mass of all of the **planets** in the solar system (leave the sun out).

3. What percentage of the mass of the whole solar system is in the sun?

4. What percentage is in the planets?

5. Calculate what percentage of the total mass of the solar system's planets (planets only!) is in each planet and present them as a table. Round to the nearest hundredth of a percent (two decimal places).

6. If you add up all of the answers to question 5, they should fall very slightly short of 100%. This missing matter is the debris left over from the formation of the solar system in the form of the asteroid and Kupier belts. Using the numbers in Table 1 for their masses, what percentage of the mass of the planets in the solar system is in the two belts?

TURN OVER – MORE ON BACK

7. How many times more massive is the Kupier belt than the asteroid belt? Round to the nearest ten.

8. Calculate how much of the **entire** solar system's mass is in the Earth and express it as both a decimal and a percentage.

9. Using the value in table 1 for the mass of the Earth, calculate how many "earth masses" make up Jupiter. In other words, how many times more massive is Jupiter than the Earth?

10. Using the value in table 1 for the mass of Jupiter, calculate how many "Jupiter masses" make up the Sun. In other words, how many times more massive is the Sun than Jupiter?

11. Which of the masses given in table 1 do you think is the most uncertain and why?

Part 2: Quantitative Literacy Survey

Go to the website https://ua.datstathost.com/OSS-Collector/Survey.ashx?Name=QL_Fall2011 and complete the survey that you find there, or contact me for an alternate assignment before Tuesday, September 6th if you would rather not participate in the study described on the first page. You will receive full credit for this portion if you complete the online questionnaire, regardless of whether or not your answers are correct.