Homework #1
Due Monday, October 1 in class

Instructions

This handout is your worksheet. Please write your answers in the spaces provided. In cases where a calculation is called for, please show your work including any sketches, so we can evaluate your answer and assign partial credit as appropriate. We will only accept homework on this worksheet.

This homework assignment consists of the 5 questions below. Each question has equal weight.

1. Write the following numbers using scientific notation

   a. 0.00017 = _____

   b. 5341.3 = _____

   c. 12.3 Billion = _____

   d. 25/1,000,000 = _____

   e. 6 Trillion = _____

2. Two Martian astronomers, Marvin and Melvin, are located due north and south of each other on the day of the Martian Equinox. Marvin is on the Martian Equator and sees no shadows cast at Noon. Melvin is 667 Martian Kilometers north of the Equator and sees a 6-degree shadow at Noon.

   a. What is the circumference of Mars in Martian Kilometers?

   b. The actual diameter of Mars is 6794 km. How many Earth meters are in a Martian meters

   This is essentially Eratosthenes' method for measuring the circumference of the Earth translated to Mars. Drawing a picture like the one shown in the class notes will help in part a.

3. An Apollo astronaut dressed in his Moon Suit had a total mass of 162kg (360 pounds) on Earth. The Moon's gravity is $1/6^{th}$ that of Earth's. While standing on the Moon's surface, what is the astronaut's mass and weight (in kg and pounds, respectively).

4. Aliens abduct you and dump you on a small desert island somewhere on Earth. You notice that the Sun's path at sunrise and sunset is always tilted by 30-degrees from your Horizon, and that you cannot see the constellation of the Big Dipper at night. What is the latitude of your island?

5. On the Autumnal Equinox on 2008, the Moon will be in Last Quarter phase. What is the approximate time (to the nearest hour) of moonrise on this day? (You can safely ignore the distinction between daylight savings time and standard time in this case)