CHAPTER 13

1. A 7 kg mass is separated by a distance of 11 m from a 42 kg mass.
   a. What is the gravitational force on the 7 kg mass due to the 42 kg mass?
   b. What is the gravitational force on the 42 kg mass due to the 7 kg mass?

2. The earth has a mass of 5.98×10^{24} kg, and a radius of 6.37×10^{6} m.
   a. At what altitude above the surface of the earth would an artificial satellite be in order to orbit the earth with a period of 9 hours?
   b. What tangential velocity would the satellite have?

3. The sun has a mass of 1.99×10^{30} kg, and Venus has a mass of 4.87×10^{24} kg. Venus travels in a circular orbit with a radius of 1.08×10^{11} m.
   a. What is the gravitational force of the sun on Venus?
   b. What is the gravitational force of Venus on the sun?
   c. With what velocity does Venus need to circle the sun in order to balance this gravitational force?
   d. How long will it take Venus to orbit the sun?