Name _____ Date _____ Period ____

Universal Gravitation – Review

1. The radius of the earth is about 6400 km. What would be the Earth's gravitational attraction on a 75 kg astronaut in an orbit 6400 km above the Earth's surface?

2. The mass of Mar's is about 6.6×10^{23} kg, and the acceleration due to gravity is 3.7 m/s^2. What is the radius of Mars?

3. The Earth's radius is about 6400 km. A 25 kg mass is taken 201 km above the earth's surface.
   a. What is the object's mass at this height?
   b. What is the weight of the object at this height?

4. The radius of a planet is 3400 km. If an object weighs 550 N at the surface of the planet, what is the weight…
   a. 12 km above the surface?
   b. 210 km above the surface?

5. A sphere of mass 85 kg is 12 m from a second sphere of mass 65 kg.
   a. What is the gravitational force of attraction between them?
   b. What is the acceleration of the first sphere toward the second?

6. Kepler's law states that $r^3/T^2 = 3.35 \times 10^{18}$ m^3/s^2. How many years would it take a planet located four times from the earth to orbit the sun? The earth's distance from the sun is 1.5×10^{11} m.

7. A 150 kg object is launched into orbit at a height of 12800 km above the earth's surface.
   a. What is the weight of the satellite on the surface of the earth?
   b. What is the weight of the satellite in orbit?
   c. What is the speed of the satellite in orbit?