Universal Law of Gravity & Satellite Motion Worksheet

Name:_____

Date:_____

Mod:_____

Directions: Answer the following questions below using information from the circular motion unit. Pay close attention to units and show all work.

Radius of Earth = 6.37×10^6 m
Mass of Earth = 5.98×10^{24} kg

1. The military wants to place a new spy satellite into orbit around the Earth at a height of 750 km above the Earth's surface. At what speed should the satellite be released from the rocket to achieve this orbit?

2. Dish Network sent a satellite into orbit about 36000km above the Earth's surface. What is the speed of the satellite in miles per hour?

3. Verizon has a satellite in an out of control orbit around the Earth traveling at a speed of 7095 m/s. What should the height of the satellite be off the surface of the earth in order to stabilize the orbit?

4. A rocket scientist is trying to determine the mass of a mysterious planet in a nearby solar system. So a satellite is sent into orbit around the unknown planet and it achieves a speed of 5600 m/s at a height of 2500 m above the ground. If the radius of the planet is 3.78×10^4 m, what is the mass of the unknown planet?