Name: _____ Date:_____

Mr. Croom's Physics Chapter 8: Gravitation

Satellite Motion

1) A spacecraft orbits Mars (mass=6.40*10^{23}kg) in a circular orbit of radius 8.01*10^{5} km. What is the period of the spacecraft?

2) How many revolutions per minute (rpm) mast a rotating space station (r=1200m) turn to provide an artificial gravity of 0.50g?

3) The moon of a planet is observed to have a nearly circular orbit (r=4.00*105 km), and an orbital period of 21.5 days. What is the mass of the planet?

4) A satellite is placed in polar orbit above the earth. Find the height above the surface if the satellite passes over the same spot once a day.

5. A satellite is placed in a circular orbit to observe the surface of Mars from an altitude of 9760 km. The equatorial radius of Mars is 3397 km. If the speed of the satellite is 1480 m/s, what is the magnitude of the centripetal acceleration of the satellite?

6. The orbital radius about the Sun of Saturn is ten times that of Earth. Complete the following statement: The period of Saturn is equal to

7. A rocket is in synchronous orbit about the earth. What is the speed of the satellite?

8. A moon orbits it $4.25 \cdot 10^{23}$ kg planet every 6.27 days. How far away is it?