

# Universal Gravitation

## Chapter Eight Rev 3

### Physics

1. What is the force of gravitational attraction between two protons ( $1.67 \times 10^{-27}$  kg each) that are  $1.12 \times 10^{-10}$  m apart?...b) What acceleration would this force give the proton?
2. An asteroid is  $4.5 \times 10^5$  kg and has a radius of 4.2 m. What is the force of gravity between this asteroid and a smaller 2.0 kg one that is 1.0 m above its surface? (consider  $r_2$  to be a point) ....b) What speed would it have to circle the larger asteroid at to stay in orbit?...c) What would its period be?
3. What would the period of another asteroid be that was 4.0 m away from the surface of the larger asteroid in #2?
4. How fast does a comet travel at a point when it's a) closest to the sun at an orbit  $\frac{1}{2}$  that of Venus's orbit and b) farthest, when its  $5.6 \times 10^{11}$  outside Pluto's orbit?
5. What is the period of Mercury as it circles the sun?...b) what is its orbiting velocity?
6. What is "g" on the surface of Mercury?...What would a 90.0 kg person weigh there?
7. What  $a_c$  does the sun give Mercury?