Name:

Physics 12
M. Lam

Orbits

Block:

1. A 1 500 kg satellite is in a stable circular orbit at an altitude of 4.0×10^5 m above the Earth's surface. At what speed is the satellite travelling?

2. The moon Titan orbits the planet Saturn with a period of 1.4×10^6 s. The average radius of this orbit is 1.2×10^9 m.
   a) What is Titan's centripetal acceleration?
   b) What is Saturn's mass?

3. A satellite orbits Earth at a velocity of 3.1×10^3 m/s. What is the radius of this orbit?

4. Pluto has a mass of 1.31×10^{22} kg. Charon, Pluto's largest moon, has an orbital radius of 17 500 km.
   a) What is Charon's orbital speed?
   b) What is Charon's orbital period?

5. A satellite is in a circular orbit around a planet of mass 4.44×10^{23} kg. If the period of revolution 6.0×10^5 s, how far away is the satellite from the planet?

6. A satellite of mass m orbits Earth at a distance R with a period T and speed v. What will the period and speed be of a satellite…
   a) of mass $2m$ (at the same distance, R)
   b) orbiting at a distance $3R$
   c) orbiting at a distance $\frac{1}{2}R$