

Physics 12
M. Lam

Orbits

Name:

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 $\frac{1}{2}R$