# Orbits

## Problems

1. Find the tangential speed $v$ of a satellite of mass $m$ in circular orbit with radius $r$ around an attractor with mass $M$.
   a. What is the force of the gravitational attraction on the attractor from the satellite?

   b. What is the centripetal force on the satellite?

   c. at what tangential speed $v$ are these forces equal?

2. Find the orbital period $T$ of the satellite of question 1.

3. The mass of Earth is $5.97 \times 10^{24}$ kg and the mass of the Moon is $7.35 \times 10^{22}$ kg. The Moon orbits Earth once every 27.3 days. How far is the Moon from the Earth?
   b. What is the escape speed from Earth at the Moon's orbital distance, $3.84 \times 10^{8}$ m from Earth's center?