
Worksheet 8: Gravity

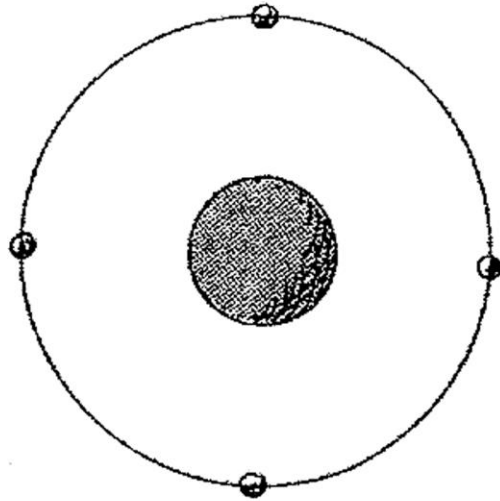
Newton's gravity formula

$F = G \frac{m_1 m_2}{r^2}$, where $G = 6.6742 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$, the universal gravitational constant

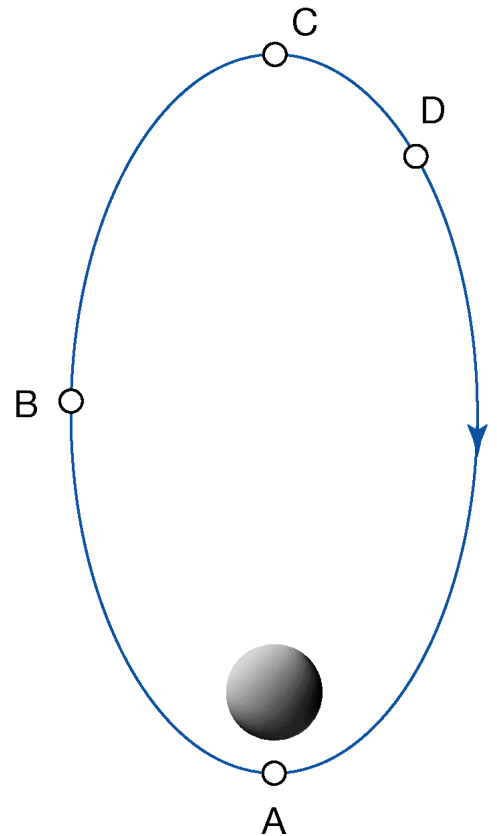
Problems

1. A satellite revolves around its planet in a perfectly circular orbit at a constant speed.
 - a. Draw and label force vectors F .
 - b. Draw and label velocity vectors v .
 - c. What is the angle between the F and v vectors?

 - f. Is there any component of F parallel to v ? _____



2. The picture to the right shows the path of a satellite orbiting a planet.
 - a. At which position(s) is the satellite slowing down?
 - b. At which position(s) is the satellite speeding up?
 - c. At which position(s) is the satellite's direction changing?

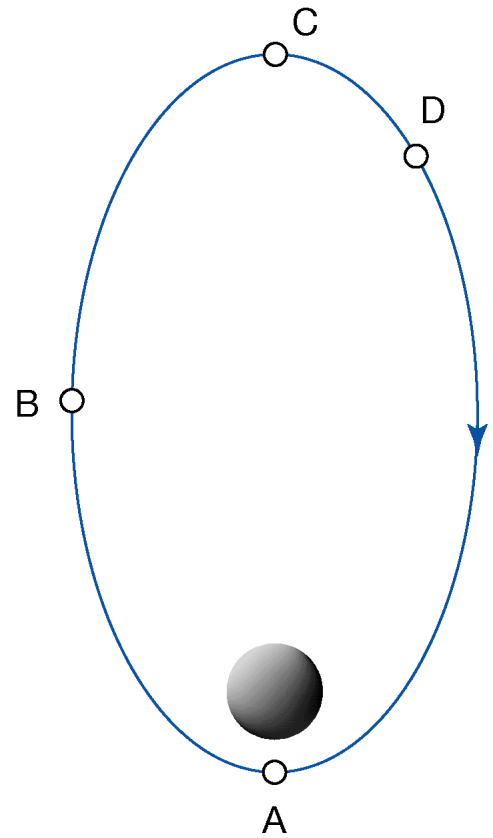


3. Rank the positions A, B, C, and D in descending order of the satellite's:

a. Gravitational force.

b. Acceleration.

c. Speed.



4. What distance from the Earth's center would a geosynchronous satellite, with an orbital period of 86,164 s, orbit?