Chapter 6 4-Minute Drill

Centripetal force in terms of r and v $\frac{mv^2}{r}$

Centripetal acceleration in terms of r and v $\frac{v^2}{r}$

Tension in a string keeping mass m in horizontal circle of radius r

Tension in a string keeping mass m in ~~horizontal~~ Vertical circle of radius r (top of circle) $\frac{mv^2}{r}$

$$\frac{mv^2}{r} - mg$$

Tension in a string keeping mass m in ~~horizontal~~ Vertical circle of radius r (bottom of circle)

$$\frac{mv^2}{r} + mg$$

Gravitational force between two bodies m_1 and m_2 $G\frac{m_1 m_2}{r^2}$

Acceleration due to gravity g in terms of a planet's mass M and radius R

$$\frac{GM}{r^2}$$

Velocity of an object in a circular orbit with radius R around a planet of mass M.

$$\sqrt{\frac{GM}{r}}$$

★Kepler's Law relating the period and average orbital radius of a body in orbit

$$T = 2\pi\sqrt{\frac{r^3}{GM}}$$

Kepler's Law relating the periods and average orbital radii axis of two bodies orbiting a common larger body.

$$\frac{T_A^2}{T_B^2} = \frac{r_A^3}{r_B^3}$$