

Physics I Equations

Equations:

$$R^2 = X^2 + Y^2$$

$$\theta = \tan^{-1}\left(\frac{Y}{X}\right)$$

$$\vec{v} = \frac{d\vec{r}}{dt}$$

$$\vec{a} = \frac{d\vec{v}}{dt}$$

for constant a:

$$v = v_0 + at$$

$$v^2 = v_0^2 + 2a(x - x_0)$$

$$x = x_0 + v_0t + \frac{1}{2}at^2$$

$$\bar{v} = \frac{1}{2}(v_0 + v)$$

$$\sum \vec{F} = m\vec{a}$$

$$\vec{F}_{ab} = -\vec{F}_{ba}$$

$$F_w = mg$$

$$F_{fr} = \mu_s F_N \text{ or } \mu_k F_N$$

$$\vec{F}_g = G \frac{m_1 m_2}{r^2} \hat{r}_{12}$$

$$a_R = \frac{v^2}{R}$$

$$\vec{F}_s = -k\vec{x}$$

Constants:

$$g = 9.81 \text{ m/s}^2$$

Metric System:

$$T = 10^{12}$$

$$k = 10^3$$

$$\mu = 10^{-6}$$

$$G = 10^9$$

$$c = 10^{-2}$$

$$n = 10^{-9}$$

$$M = 10^6$$

$$m = 10^{-3}$$

$$p = 10^{-12}$$