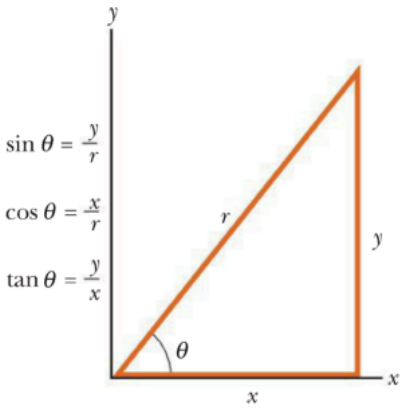
POTENTIALLY USEFUL INFORMATION (**SOME EQUATIONS ARE ONLY VALID IN SPECIFIC SITUATIONS**):

Conversions: 1 m = 3.281 ft  1 mile = 1609 m  1 kg = 2.2 pounds  g = 9.8 m/s$^2$ = 32 ft/s$^2$

1 pound = 4.45 N  1 hp = 746 W




$$r^2 = x^2 + y^2$$

1D or 2D motion:

$$\bar{v} = \frac{\Delta x}{\Delta t} \qquad \bar{a} = \frac{\Delta v}{\Delta t} \qquad v = \lim_{\Delta t \to 0} \frac{\Delta x}{\Delta t} \qquad a = \lim_{\Delta t \to 0} \frac{\Delta v}{\Delta t}$$

$$x = x_o + \bar{v}t = x_o + v_o t + \frac{1}{2}at^2 \qquad v = v_o + at$$

$$v^2 = v_o{}^2 + 2a\left(x - x_o\right)$$

Quadratic formula:

$$ax^2 + bx + c = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\vec{F} = \sum_i \vec{F}_i = m\vec{a} = \frac{\Delta \vec{p}}{\Delta t} \qquad F_g = mg \qquad F_{sp} = -kx \qquad F_s \le \mu_s n \qquad F_k = \mu_k n \qquad \vec{F}_{AB} = -\vec{F}_{BA}$$