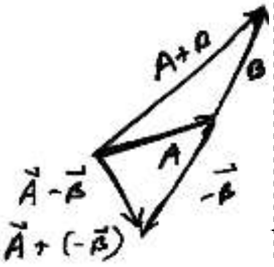
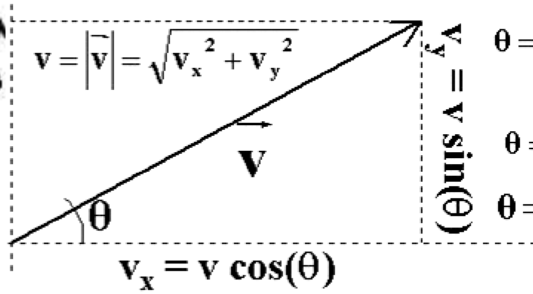




$$\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right)$$

$$\theta = \cos^{-1}\left(\frac{v_x}{v}\right)$$

$$\theta = \sin^{-1}\left(\frac{v_y}{v}\right)$$

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 + 4ac}}{2a}$$

$$\bar{\vec{v}} = \frac{\Delta\vec{r}}{\Delta t} \qquad \bar{\vec{a}} = \frac{\Delta\vec{v}}{\Delta t}$$

1D

$$\Delta x = x_f - x_i$$

$$\Delta v = v_f - v_i$$

$$a = \Delta v / \Delta t$$

$$\Delta x = \bar{v}\,\Delta t$$

a = constant

$$\bar{v} = (v_f + v_i)/2$$

$$v = v_o + at$$

$$x = x_o + v_o t + \frac{1}{2} a t^2$$

$$v^2 - v_o^2 = 2a(x - x_o)$$

2D

$x \rightarrow x, y \quad x_o \rightarrow x_o, y_o$

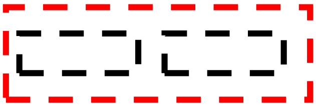
$v \rightarrow v_x, v_y \quad v_o \rightarrow v_{ox}, v_{oy}$

$a \rightarrow a_x, a_y$

NL

$$\vec{F}_{tot} = m\,\vec{a}$$

Defining the system



Grouping masses

Identifying F – reaction F

Going around corners consistently