



Vector de Posición (m)

$$\vec{r} = \vec{r}_x + \vec{r}_y + \vec{r}_z$$

Vector desplazamiento (m)

$$\Delta \vec{r} = \vec{r}_2 - \vec{r}_1$$

Ecuación del movimiento

$$\vec{r}(t) = x(t) \cdot \vec{i} + y(t) \cdot \vec{j} + z(t) \cdot \vec{k}$$

Velocidad (m/s)

Media

$$\vec{v}_m = \frac{\Delta \vec{r}}{\Delta t}$$

Instantánea

$$\vec{v} = \lim_{t \rightarrow 0} \frac{\Delta \vec{r}}{\Delta t} = \frac{d\vec{r}}{dt}$$

Media

$$\vec{a}_m = \frac{\Delta \vec{v}}{\Delta t}$$

Instantánea

$$\vec{a} = \lim_{t \rightarrow 0} \frac{\Delta \vec{v}}{\Delta t} = \frac{d\vec{v}}{dt}$$

Aceleración (m/s²)

Tangencial (módulo)

$$\vec{a}_t = \frac{dV}{dt} \cdot \vec{u}_t$$

Componentes de la Aceleración

Normal (dirección)

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

Total

$$a = \sqrt{a_t^2 + a_n^2}$$

MRU

$$x = x_0 + v t$$

$$v = \frac{x}{t}$$

MRUA

$$x = x_0 + v_0 t + \frac{1}{2} a t^2$$

$$v = v_0 + a t$$

$$v^2 = v_0^2 + 2 a s$$

Tiro horizontal

Eje X: MRU

$$v_x = v_0$$

Eje Y: MRUA

$$v_y = v_0 - g t$$

$$x = x_0 + v_x t$$

$$y = y_0 + v_{0y} t - \frac{1}{2} g t^2$$

Tiro oblicuo

Eje X: MRU

$$v_x = v_{0x} = v_0 \cos \alpha$$

Eje Y: MRUA

$$v_y = v_0 \sin \alpha - g t$$

$$x = x_0 + v_0 \cos \alpha t$$

$$y = h_0 + v_0 \sin \alpha t - \frac{1}{2} g t^2$$

Movimientos circulares

Posición Angular (rad)

$$\theta = \theta(t)$$

$$s = \theta R$$

Velocidad Angular (rad/seg)

$$\omega_M = \frac{\Delta \theta}{\Delta t}$$

$$\omega_i = \lim_{\Delta t \rightarrow 0} \frac{\Delta \theta}{\Delta t} = \frac{d\theta}{dt}$$

$$v = \omega R$$

Aceleración Angular (rad/seg²)

$$\alpha_M = \frac{\Delta \omega}{\Delta t}$$

$$\alpha_i = \lim_{\Delta t \rightarrow 0} \frac{\Delta \omega}{\Delta t} = \frac{d\omega}{dt}$$

$$a_T = \alpha R$$

MCU

$$\theta = \theta_0 + \omega t$$

MCUA

$$\omega = \omega_0 + \alpha t$$

Periodo (seg)

$$T = \frac{2\pi}{\omega}$$

Frecuencia (Hz)

$$f = \frac{1}{T}$$

Aceleración normal

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

$$\theta = \theta_0 + \omega_0 t + \frac{1}{2} \alpha t^2$$

$$\omega^2 - \omega_0^2 = 2 \alpha \theta$$