

Uniformly Accelerated Motion

Equations of Motion

Horizontal

$$v = v_0 + at$$

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

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

$$x - x_0 = \frac{1}{2}(v + v_0)t$$

$$x - x_0 = vt - \frac{1}{2} a t^2$$

Vertical

$$v = v_0 - gt$$

$$y - y_0 = v_0 t - \frac{1}{2} g t^2$$

$$v^2 = v_0^2 - 2g(y - y_0)$$

$$y - y_0 = \frac{1}{2}(v + v_0)t$$

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

$$x - x_0 \implies y - y_0$$

$$a \implies -g$$