

The Equations

1-D Kinematics

$$\Delta x = x_2 - x_1 = x - x_0$$

$$\Delta t = t_2 - t_1 = t - t_0$$

$$\Delta t = t \text{ (when } t_0 = 0 \text{ s)}$$

$$\Delta x_{tot} = \Delta x_1 + \Delta x_2 + \Delta x_3 \dots$$

$$\Delta t_{tot} = t_1 + t_2 + t_3 \dots$$

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

$$\Delta v = v - v_0$$

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

$$\bar{v} = \frac{v_0 + v}{2}$$

$$v = v_0 + at$$

$$\Delta x = vt - \frac{1}{2}at^2$$

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

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

$$v^2 = v_0^2 + 2a\Delta x$$

$$v_y = v_{0y} - gt$$

$$\Delta y = v_{0y}t - \frac{1}{2}gt^2$$

$$v_y^2 = v_{0y}^2 - 2g\Delta y$$

$$\Delta y = v_yt + \frac{1}{2}gt^2$$

The Constants

1-D Kinematics

$$g_{\text{Earth's Surface}} = 9.802 \text{ m/s}^2$$