

The Equations

1-D Kinematics → 2-D Kinematics

$$\Delta x = x - x_0$$

$$\bar{v} = \frac{x - x_0}{t}$$

$$a = \frac{v - v_0}{t}$$

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

$$v = v_0 + at$$

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

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

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

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

$$\Delta x = v_{0x}t$$

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

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

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

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

$$y = \tan\theta x - \frac{g}{2v_0^2 \cos^2\theta} x^2$$

The Constants

1-D Kinematics → 2-D Kinematics

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