

$$V = V_0^2 + 2a\Delta y$$

$$V_0^2 = 2g y_m$$

$$\frac{V_0^2 \sin^2 \theta}{2g} = y_m$$

$$\Delta y = v_0 t + \frac{1}{2} a t^2$$

$$0 = v \sin \theta t + \frac{1}{2} g t^2 - y_m$$

Solve for t_m

$$\Delta y = v_0 t + \frac{1}{2} g t^2$$

$$2 - y_m = -\frac{1}{2} g t^2$$

$$t = \frac{\sqrt{2(y_m - 2)}}{g} = t_L$$

$$t_{total} = t_L + t_m$$

$$x_{pos} = (V_0 \cos \theta_v \cos \theta) (t_{total})$$

$$y_{pos} = (V_0 \cos \theta_v \sin \theta) (t_{total})$$