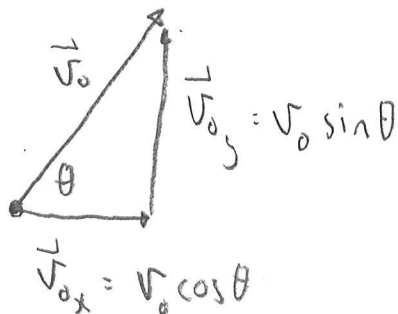
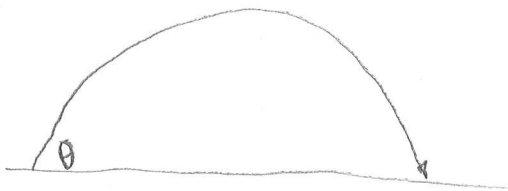


1. Assume the slingshot is fired directly from the ground.

a. Given $\vec{d}_x$ and v_0 , find θ



$$d_y = v_{0y}t + \frac{1}{2}a_y t^2$$

$$0 = v_0 \sin \theta t + \frac{1}{2}(-9.81 \text{ m/s}^2)t^2$$

$$0 = t(v_0 \sin \theta - 4.905 \text{ m/s}^2 t) = 0$$

✓
 $t = 0$

↓
 $v_0 \sin \theta - 4.905 \text{ m/s}^2 \cdot t = 0$

$$t = \frac{v_0 \sin \theta}{4.905 \text{ m/s}^2}$$

$$d_x = v_{0x} \cdot t = v_0 \cos \theta \times \frac{v_0 \sin \theta}{4.905 \text{ m/s}^2} = \frac{v_0^2 \sin \theta \cos \theta}{4.905 \text{ m/s}^2}$$