

$$\left[(V_0 \cos(\theta))t \right] i + \left[h + (V_0 \sin(\theta))t - \frac{1}{2}gt^2 \right] j = r(t) \quad h=0$$

$$\text{Zero dist} = 91.44 \text{ m}$$

$$\text{calc dist} = 182.88 \text{ m}$$

$$V_{0x} = 2375 \text{ ft/s} \quad g = -9.8 \text{ m/s}^2$$

$$V_{0m} = \frac{2375 \text{ ft}}{15} \times \frac{0.3048 \text{ m}}{1 \text{ ft}} = 723.9 \text{ m/s}$$

$$G = \Theta = 8.558906616 \times 10^{-4}$$

$$= .0008559$$

$$0 = h + (V_0 \sin(\theta))t - 4.905t^2$$

$$0 = t(V_0 \sin(\theta) - 4.9t)$$

$$t=0 \quad V_0 \sin(\theta) - 4.9t = 0$$

$$-4.9t = -V_0 \sin(\theta)$$

$$t = \frac{V_0 \sin(\theta)}{4.9}$$

$$91.44 = V_0 \cos(\theta) \left(\frac{V_0 \sin(\theta)}{4.9} \right)$$

$$91.44 = \frac{V_0^2 \sin(2\theta)}{2 \cdot 4.905}$$

$$897.0264 = V_0^2 \sin(2\theta)$$

$$\frac{897.0264}{V_0^2} = \sin(2\theta)$$

$$\arcsin\left(\frac{897.0264}{V_0^2}\right) = 2\theta$$

$$\frac{1}{2} \arcsin\left(\frac{897.0264}{V_{0m}^2}\right) = \theta$$

$$182.88 = V_0 \cos(\theta) t$$

$$\frac{182.88}{V_0 \cos(\theta)} = t$$

$$\cancel{V_0} \sin(\theta) \left(\frac{182.88}{\cancel{V_0} \cos(\theta)} \right) - 4.05 \left(\frac{182.88}{V_0 \cos(\theta)} \right)^2 = h$$

$$182.88 \tan(\theta) - \frac{4.05 (182.88)^2}{V_0^2 \cos^2(\theta)} = h$$

$$182.88 \tan(\theta) - \frac{135451.6373}{V_0^2 \cos^2(\theta)} = h$$