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

$V_{om} = 2375\ ft/s$ $\qquad g = -9.8\ m/s^2$

$V_{om} = \frac{2375\ ft}{1\ s} \times \frac{.3048\ m}{1\ ft} = 723.9\ m/s$

Zero dist = 91.44 m

Calc dist = 182.88 m

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

$= .0008559$

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

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

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

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

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

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

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

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

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

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

Theta

$$\frac{1}{2}\arcsin\left(\frac{897.0264}{V_{om}^2}\right) = \theta \qquad [4]$$

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

Time

$$\frac{182.88}{V_0\cos(\theta)} = t \qquad [2]$$

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

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

height

$$182.88\tan(\theta) - \frac{135451.6313}{V_0^2\cos^2(\theta)} = h \qquad [3]$$