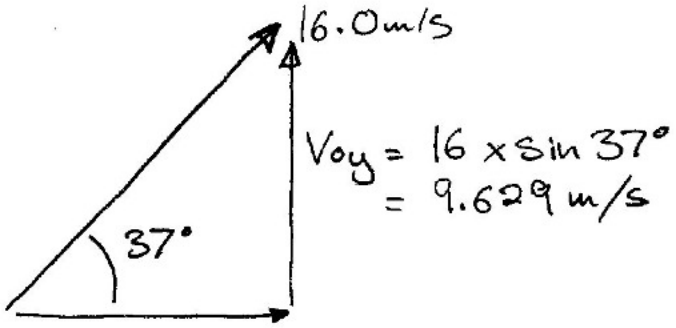
EXAMPLE (PPT)



$V_{oy} = 16 \times \sin 37°$
$= 9.629\ m/s$

$V_{ox} = 16 m/s \times \cos 37°$
$= 12.778 m/s$

a) How high does it go

$V_{fy} = 0$
$V_{oy} = 9.629\ m/s$
$a = g = -9.80 m/s$
$d_y = ?$

$V_{fy}^2 = V_{oy}^2 + 2g d_y$

$0^2 = (9.629)^2 - 19.6\, d_y$

$\boxed{d_y = 4.7\ m}$

b) time

$V_f = V_{oy} + gt$

$0 = 9.629 + (-9.8)\, t$

$t_{up} = 0.98255\ s$

$\therefore t_{total} = 1.965\ s$

or

$d_y = V_{oy} t + \frac{1}{2} g t^2$

$0 = 9.629\, t - (\frac{1}{2})(9.80)\, t^2$

$= 9.629\, t - 4.9\, t^2$

$\therefore 4.9\, t^2 - 9.629\, t + 0 = 0$

$= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{(+9.629) \pm \sqrt{92.71 - 0}}{2(4.9)}$

$= \frac{9.629 + 9.629}{9.8}$

$\boxed{t = 1.965\ s}$

c) Range $= d_x$

since V_x is const

$d_x = V_x \times t$

$= 12.778 \times 1.965\ s$

$\boxed{d_x = 25.1\ m}$