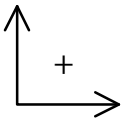
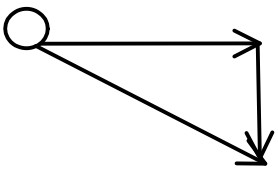
P12 - 2.8 - Ball shot Down Angle Notes



Big Diagrams!



Or off to side

$v = hcos\theta$

$v = 10cos15$

$v = 9.66\frac{m}{s}$

$v = hsin\theta$

$v = 10sin15$

$v = -2.59\frac{m}{s}$

$\theta = 15^o$

5m

$v_r = 10$

$v = 9.66\frac{m}{s}$

$\theta = 46.6^o$

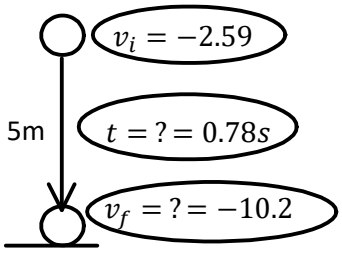
$d = ? = 7.8m$

$v_r = 14.1$

$v = -10.2\frac{m}{s}$

The final resultant velocity is $14.1\frac{m}{s}$ 46.6^o *below horizontal*

Down



$\Delta d = v_{iy}t + \frac{1}{2}at^2$

$-5 = -2.59t + \frac{1}{2}(-9.8)t^2$

$0 = -2.59t + \frac{1}{2}(-9.8)t^2 + 5$

$0 = -4.9t^2 - 2.59t + 5$

$t = 0.78s$ *Quadform*

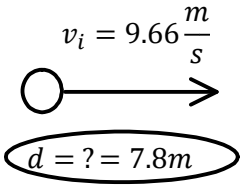
$v_f = v_i + at$

$v_f = -2.59 + (-9.8)(0.78)$

$v_f = -2.59 - 7.6$

$v_f = -10.2\frac{m}{s}$

Over

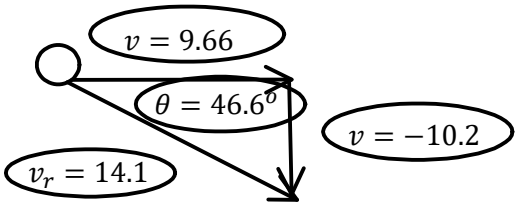


$v = \frac{d}{t}$

$d = vt$

$d = 10t$

$d = 7.8m$



$tan\theta = \frac{o}{a}$

$\theta = \tan^{-1}\left(\frac{+10.2}{9.66}\right)$

$\theta = 46.6^o$

Always Inverse Positive

$a^2 + b^2 = c^2$

$c = \sqrt{a^2 + b^2}$

$c = \sqrt{(9.66)^2 + (-10.2)^2}$

$c = 14.1\frac{m}{s}$

$sin\theta = \frac{O}{H}$

$H = \frac{0}{sin\theta}$

$H = \frac{\pm 10.2}{sin46.66}$

$H = 14.02$

Rounding!

SOH CAH TOA is fairy land and we teach you properly in Trig 12

$\theta = -46.66^o$!!!

Or Below