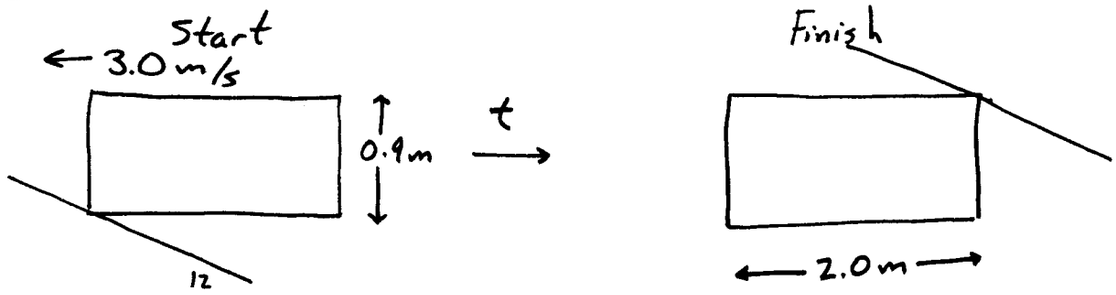
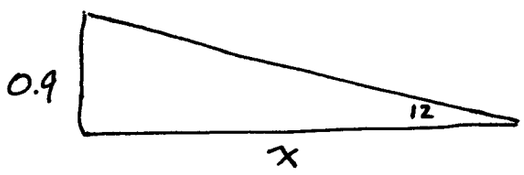
Chapts. 2 & 3

2.12



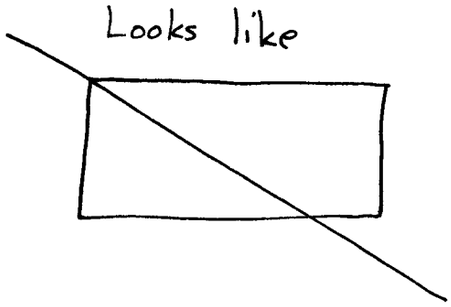
At what distance is the wall 0.9m high?



$$\tan 12 = \frac{0.9}{x_{WALL}}$$

$$x_{WALL} = \frac{0.9}{\tan 12} = 4.2\ m$$

Looks like



Must travel window!

~~#~~ ~~#~~

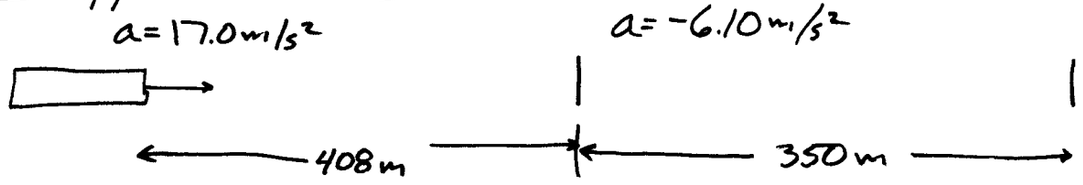
$$x_{TOT} = x_{WALL} + x_{WINDOW}$$

$$x_T = 4.2m + 2.0m = \underline{6.2\ m}$$

$$x = vt \Rightarrow t = \frac{x}{v} \qquad t = \frac{6.2\ m}{3.0\ m/s} = \underline{2.1\ s}$$

Chapts 2 & 3 (pg 2)

2.30



1 $v^2 = v_0^2 + 2ax$ $\quad v^2 = 2(17.0\ m/s^2)\ 408\ m$

$v = 118\ m/s$

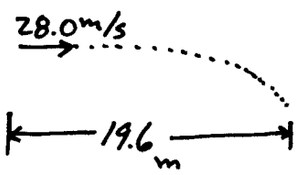
2 $v^2 = (118\ m/s)^2 + 2(-6.10\ m/s^2)(350\ m)$

$\underline{v = 98.0\ m/s}$

2.64

	sign	magnitude (km/h)
A	+	$\frac{1}{0.2} = 5$
B	0	$\frac{0}{0.2} = 0$
C	−	$\frac{-0.75}{0.2} = -3.75$
D	+	$\frac{1}{0.4} = 2.5$

3.26



$x = x_0 + v_0 t + \frac{1}{2} a t^2$

$x = 28.0(t)$

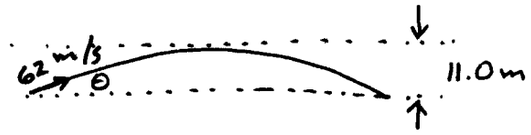
$19.6 = 28.0t$ $\quad \underline{t = 0.7\ s}$

$y = y_0 + v_0 t + \frac{1}{2} a t^2$

$0 = y_0 + \frac{1}{2}(-9.8)(0.7)^2$ $\quad \underline{y_0 = 2.4\ m}$

Chapts 2 & 3 (pg 3)

3.32



$y = y_0 + v_0 t + \frac{1}{2} a t^2$

$V_y = 62 \sin\theta$

$V_x = 62 \cos\theta$

$0 = 62 \sin\theta\, t - \frac{9.8}{2} t^2$

$\frac{9.8}{2} t = 62 \sin\theta \Rightarrow t = \frac{2}{9.8} 62 \sin\theta$

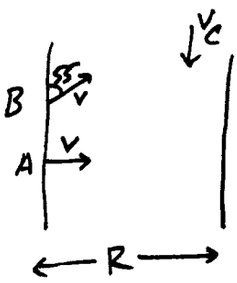
at $t' = \frac{t}{2}$, $y = 11m$

$11 = 62 \sin\theta \left(\frac{x}{9.8} \frac{62 \sin\theta}{x}\right) - \frac{9.8}{2} \left(\frac{x}{9.8} \frac{62 \sin\theta}{x}\right)^2$

$11 = \frac{1}{9.8} (62 \sin\theta)^2 - \frac{1}{2(9.8)} (62 \sin\theta)^2$

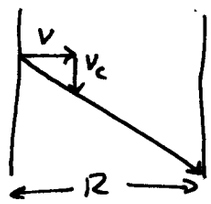
$\Rightarrow \theta = 13.7^\circ$ above horizontal

3.60



Only care about x components

A



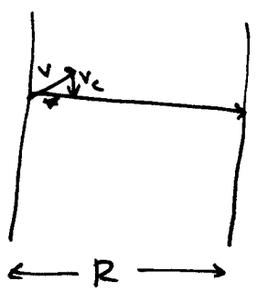
but in x-direction

$R = x_0 + v_0 t_A + \frac{1}{2} a t_A^2$

$R = v t_A$

$t_A = \frac{x}{R} \frac{R}{v}$

B



x-component of v

$V_x = V \sin 55$

so $R = V \sin 55\, t_B \Rightarrow t_B = \frac{R}{V \sin 55}$

$\frac{t_A}{t_B} = \frac{\frac{R}{V}}{\frac{R}{V \sin 55}} = \sin 55 \Rightarrow \frac{t_A}{t_B} = 0.82$