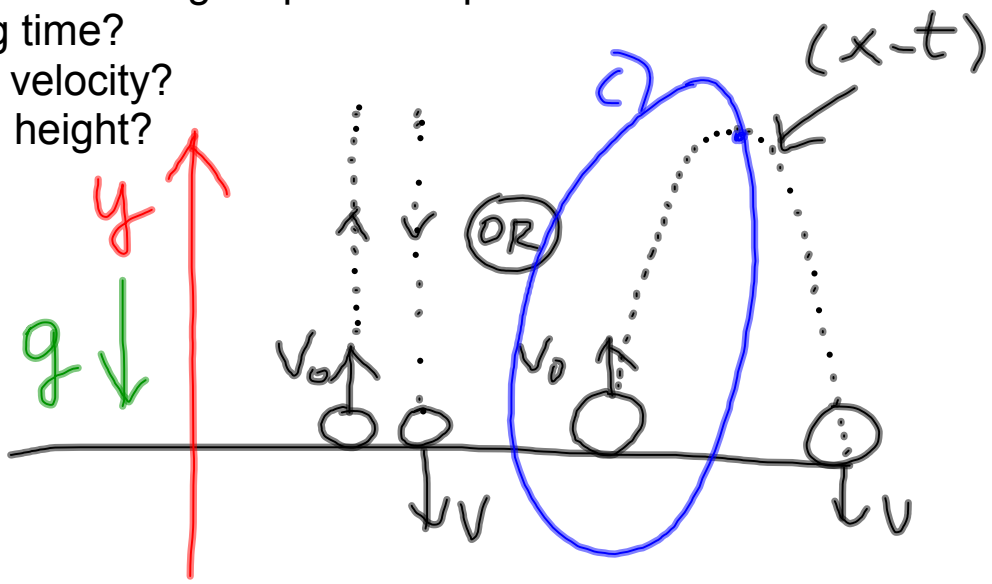
Ex.1

A ball is shot straight up with a speed of 80 m/s. Find:

A) Hang time?

B) Final velocity?

C) Max. height?



Oct 1-11:55 AM

$V_0 = 80 \frac{m}{s}$

$V = ? = -V_0$!!

$g = -9.8 \frac{m}{s^2}$ ..

$t = ?$

$\Delta y = 0$!!!

a) $\Delta y = V_0 t + \frac{1}{2} g t^2$

$0 = 80t - 4.9t^2$

$0 = t(80 - 4.9t)$

$t_1 = 0$

$(80 - 4.9t) = 0$

$t_2 = 16.3\,s$

Oct 10-12:30 PM

a) $V = -80 \frac{m}{s}$

$\Delta y = 0$, so motion is symmetrical

$V = V_0 + gt$

$-80 = 80 - 9.8t$

$t = 16.3 s$

Oct 10-12:38 PM

b) $V = -V_0$

$V = -80 \frac{m}{s}$

$\Delta y = 0$, so motion is symmetrical.

$V = V_0 + gt$

$V = 80 - 9.8(16.3)$

$V = -80 \frac{m}{s}$

Oct 10-12:42 PM

$V_0 = 80 \frac{m}{s}$

$V = ?$

$g = -9.8 \frac{m}{s^2}$!!

$t = ?$

$\Delta y = 0$!!

a) $V = V_0 + gt$

$-80 = 80 - 9.8t$

$t = 16.3\ s$

b) $V = -V_0$

$V = -80 \frac{m}{s}$

$\Delta y = 0$, so motion is symmetrical

FOR PART a)

$V = -V_0 \Rightarrow V = -80 \frac{m}{s}$

$\Delta y = 0$, so motion is symmetrical

Oct 10-9:25 AM

c) NEW PROBLEM $\Rightarrow$ NEW LIST

$V_0 = 80 \frac{m}{s}$

$V = 0$!!!

$g = -9.8 \frac{m}{s^2}$

$t = ?$ $\left(\frac{1}{2} t_{TOTAL}\right)$

$\Delta y = ?$

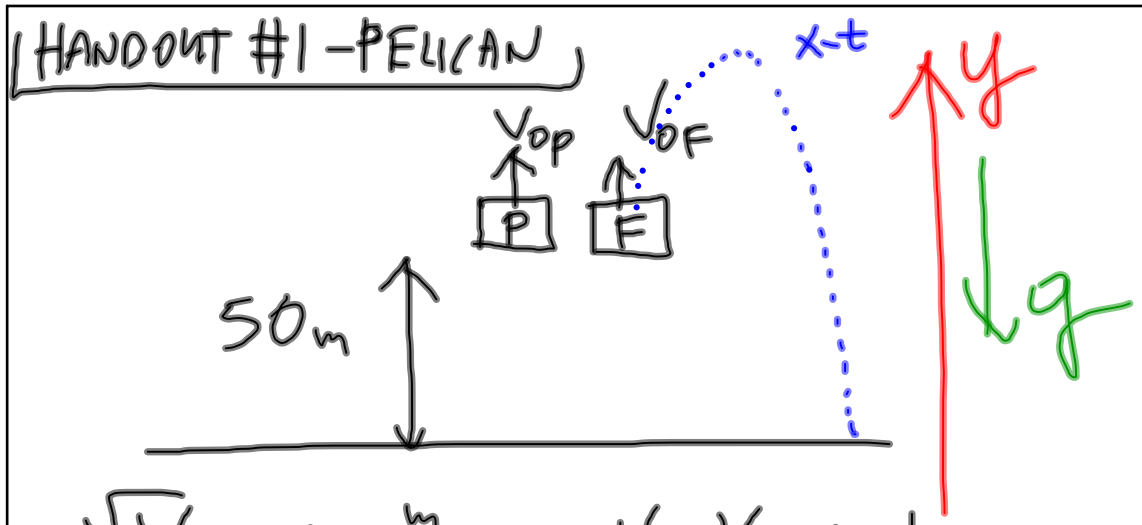
$\Delta y_{MAX.} = \frac{V^2 - V_0^2}{2g}$

$\Delta y_{MAX.} = 326\ m$

OR $\Delta y = \frac{1}{2}(V_0 + V)t$

Oct 10-9:35 AM

HANDOUT #1 - PELICAN



a) $V_{0F} = 0.5 \frac{m}{s}$
$V = ?$
$g = -9.8 \frac{m}{s^2}$
$t = 2.5s$
$\Delta y = ?$

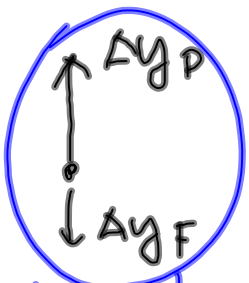
$V = V_{0F} + gt$
$V = 0.5 - 9.8(2.5)$
$V = -24 \frac{m}{s}$

Oct 10-9:35 AM

b) $\Delta y_F = \frac{1}{2}(V_0 + V)t$

$\Delta y_F = \frac{1}{2}(0.5 - 24)(2.5)$

$\Delta y_F = -29.4 \text{ m}$



$\Delta y_P = V_{0P} t + \frac{1}{2} a t^2$ (~~$\frac{1}{2} a t^2$~~ → 0)

$\Delta y_P = (0.5)(2.5)$

$\Delta y_P = 1.25 \text{ m}$

$d = |\Delta y_P| + |\Delta y_F|$

$d = 30.7 \text{ m}$

Oct 10-9:50 AM

c) $V = V_{OF} + gt$

$V = 0.5 - 9.8(0.05)$

$V = 0.21 \frac{m}{s}$

Oct 10-9:56 AM

d) NEW LIST.

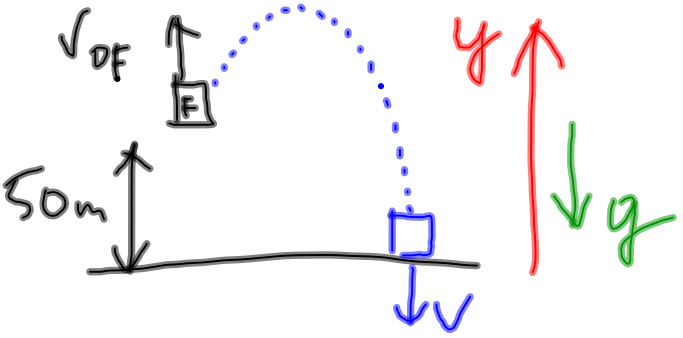
$V_{OF} = 0.5 \frac{m}{s}$

$V_F = ?$

$g = -9.8 \frac{m}{s^2}$

$t = ?$

$\Delta y = -50\,m$!!!



$\Delta y = V_0 t + \frac{1}{2} g t^2$

$-50 = 0.5t - 4.9t^2$

FULL QUADRATIC NEED GRAPHING CALC. TO SOLVE OR FORMULAS...

FIND (V) FIRST & THEN (t).

Oct 10-1:15 PM

d) $V \rightarrow \quad \Delta y = \frac{V^2 - V_0^2}{2 \cdot g}$

$-50 = \frac{V^2 - (0.5)^2}{2(-9.8)}$

$V = -31.3 \frac{m}{s}$ FROM SKETCH

e) $t \rightarrow \quad V = V_0 + gt$

$-31.3 = 0.5 - 9.8t$

$t = 3.2\,s$

Oct 10-1:19 PM

HW due Tuesday: #2 from 10/10/14 Handout

Problems to practice from additional handout - see Fusion page for better quality if your copy is bad.

#33, 35-37, 39, 42

Oct 10-1:22 PM