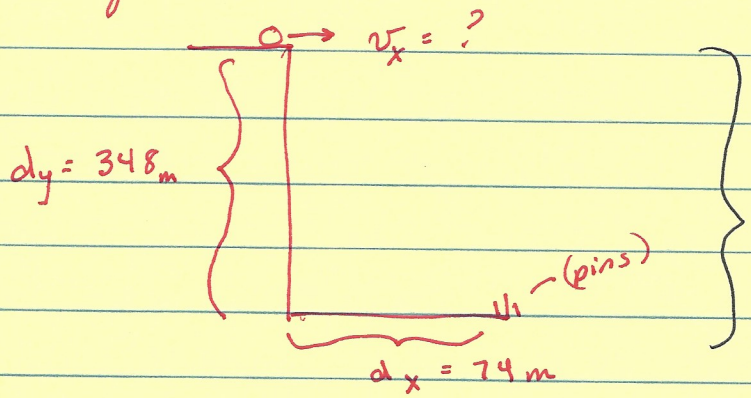
From Worksheet #1, problem 3 (solving for V_x)

diagram:



① note: you must read the problem and decide, not only if the numbers represent distance, time or velocity, but also are the numbers vertical (∴ y's) or horizontal (∴ x's)

② draw a graphic organizer, seperate the x and y information

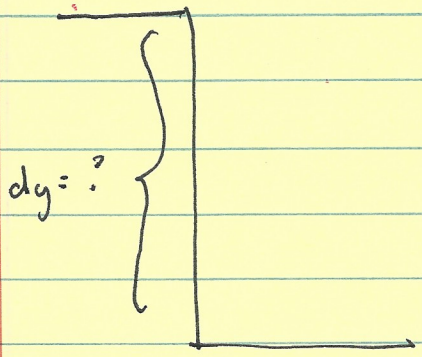
x (horizontal)	y (vertical)
$d_x = 74\,m$	$d_y = -348\,m$
④ → $V_x = ?$	
③ → inferred: $a = 0$	③ → inferred: $a = -9.8\,m/s^2$
→ to find this, use equation $v = d/t$ (since $a = 0$) but you don't know time!	$v_{iy} = 0$; $d_i = 0$
⑤ → the time in the air is the same for x and y	⑥ find time in air using y info $d_f = d_i + v_i + \frac{1}{2}at^2$ (only use y info!)
⑦ ← $t_y = t_x$ ∴	$-348 = 0 + 0 + \frac{1}{2}(-9.8)t^2$
	$t = 8.43\,s$

$V = 74/8.43 = 8.78\,m/s$

From worksheet #2, problem 3

3)

① diagram



$t = 2.5\,s$

② Note: it doesn't really tell you a d_x (or v_x), so try to solve it without x-info

d_x = ~~[illegible]~~ not given

③ draw graphic organizer

x	y
inferred: $a = 0$	$d_y = ?$
no info on v_x or d_x	$t = 2.5\,s$
	④ inferred: $a = -9.8\ m/s^2$
	$v_{i_y} = 0$ $\quad d_{i_y} = 0$

fill in and infer what you do know

$$d_f = d_i + v_i t + \tfrac{1}{2} a t^2$$

⑤ will this equation work?

$$d = 0 + 0 + \tfrac{1}{2}(-9.8)(2.5)^2$$

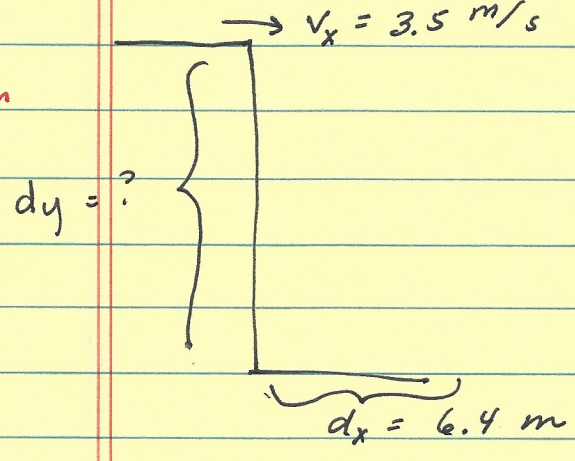
$$d = -30.63\ m$$

you solved it! didn't need the x info because they gave you time.

From Worksheet # 3, problem # 1

3)

① diagram



② Get the horizontal (x) info labeled and the vertical (y) info labeled i in the correct spots!

③ draw graphic organizer

x	y
$v = 3.5\ m/s$	$v_i = 0$
$d = 6.4\ m$	$d_i = 0$
inferred:	$a = -9.8\ m/s^2$ } inferred
$a = 0$	$d_y = 0$
therefore you can use $v = d/t$	

④ enter info in the correct columns, and write out your inferences

⑤ to solve, you need time, but time in the air is the same for both x and y ∴ use x info to find time

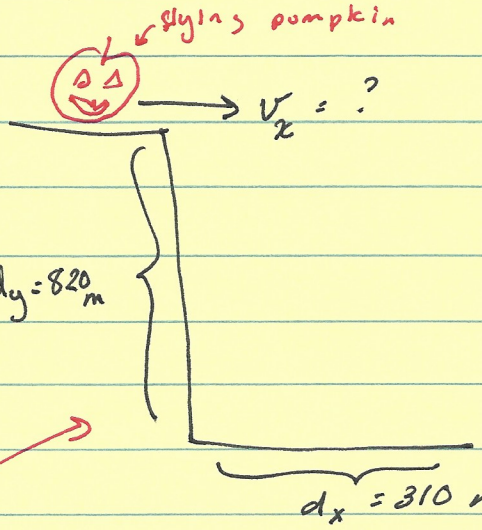
⑥
$v = d/t$
$t = d/v$
$t = 6.4/3.5$
$t = 1.83s$

⑦ use time in air to find d_y

$d_f = d_i + v_i t + \frac{1}{2} a t^2$
$d = 0 + 0 + \frac{1}{2}(-9.8)(1.83)^2$
$d = 16.38\ m$

Note:
- what makes projectile motion easy —
- you always use $v = d/t$ for the x-side,
- you always use $d_f = d_i + v_i t + \frac{1}{2} a t^2$ for the y-side

from worksheet # 3, problem 2



① diagram notice they always look the same. you just have to figure out where the info goes.

② No matter what it is, just visualize a "cliff bawler" and figure out where the info goes

③ graphic organizer!

④ fill in what you know, what you can infer

x	y
$d_x = 310\ m$	$d_y = 820\ m$
$v_x = ?$	infered: $d_{i_y} = 0$, $v_{i_y} = 0$ (this is true only for the 'y's)
infered: $a = 0$	$a = -9.8\ m/s^2$
∴ can use $v = d/t$	∴ $d_f = d_i + v_i t + \frac{1}{2} a t^2$
$v_x = 310/t$	

⑤ I need "t" to solve, but time in the air is the same for both x and y, ∴

⑥ use y info to find time

$820 = 0 + 0 + \frac{1}{2}(-9.8)t^2$

$t = 12.94\ s$

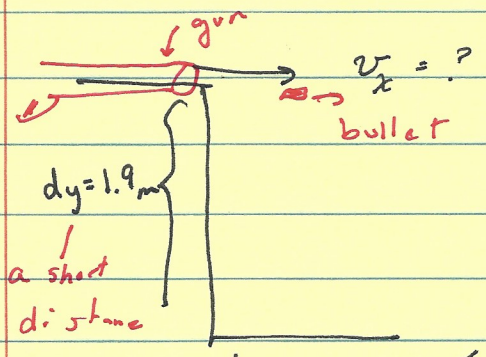
⑦ use t to find v_x

$v = 310/12.94$

$v = 23.96\ m/s$

from worksheet #4, problem 3

3)



① diagram → the diagram is not to scale, the idea is to correctly identify x's and y's

② graphic organize

③ fill in info and inferences

x	y
$d_x = 200\,m$	$d_y = 1.9\,m$
$v_x = ?$	inferred: $d_i = 0$, $v_i = 0$
inferred: $a = 0$	$a = -9.8\,m/s^2$
∴ $v = d/t$	∴ $d_f = d_i + v_i t + \frac{1}{2} a t^2$

④ always the same equation

$v = \frac{200\,m}{t}$ ← I need time!

⑤ use dy info to find time

$1.9 = 0 + 0 + \frac{1}{2}(-9.8)t^2$

$t = 0.62\,s$

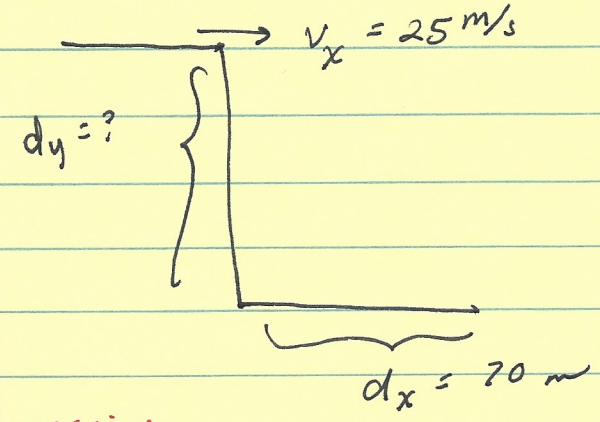
⑥ use t to find v

$v = \frac{200\,m}{0.62\,s}$

$v = 321.18\,m/s$

from worksheet #4, problem 4)

4)



① diagram

② graphic organizer

③ fill in info and inferences

x	y
$v_x = 25\ m/s$	$d_y = ?$
$d_x = 70\ m$	inference: $d_i = 0$, $v_i = 0$
inference: $a = 0$	$a = -9.8\ m/s^2$
$\therefore v = d/t$	$\therefore d_f = d_i + v_i t + \frac{1}{2} a t^2$
	$d = 0 + 0 + \frac{1}{2}(-9.8)t^2$
	④ but I need time to solve!
⑤ since time in the air is the same for x and y, use x info to find time	
$25 = 70/t$	
$t = 2.8\ s$	⑥ put t in equation and solve!
	$d = \frac{1}{2}(-9.8)(2.8)^2$
	$d = 38.42\ m$