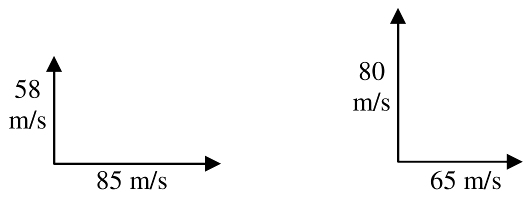
Due Tues., Oct 4

2011 PreAP Two Dimensions 13

1. The arrows below show initial Vx and Vy for two different projectiles. (*They have already been broken up into components.*)



A. * Calculate the initial velocity and direction for each. *(Find V, which is the hypotenuse.)*

B. Which one has the greatest vertical acceleration? (R or L?)

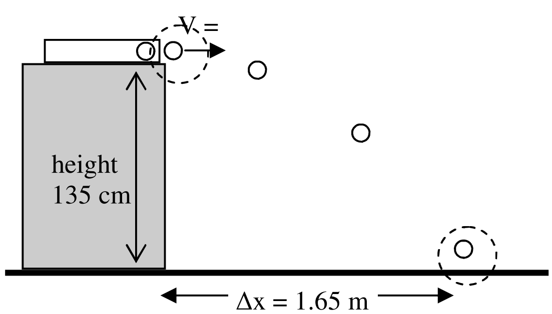
C. Which one will take longer to hit the ground?

D. Which goes higher?

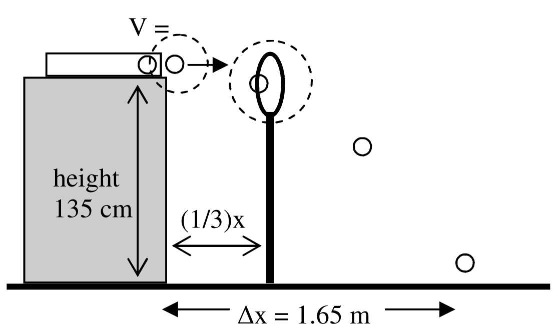
E. Which has the greatest initial speed? (*Round to no decimals*)

Let's keep practicing for the "Shoot the Hoops" Lab:

2. * Given the information at the left, calculate the initial velocity of the ball when it leaves the projectile launcher, assuming the ball is horizontally launched. The dotted circles show your initial and final positions for this part. Work in meters.



3. * Hoop 1 is placed at (1/3)x, where x is your original range. You need to find x and y for the hoop. Notice that one of the circles has been moved and that your initial conditions are the same as before.



A. What is (1/3)x? (*Put this in your x-direction information.)*

B. * Solve for the time to Hoop 1.

C. Solve for Δy (*which is NOT the vertical position of the hoop*).

D. Since $\Delta y = y_f - y_i$, solve for the vertical position of the hoop.

E. * So Hoop 1 is at what x and y position?

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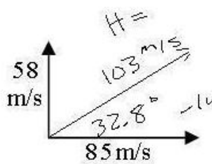

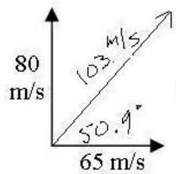

A. * Calculate the initial velocity and direction for each.
(Find V, which is the hypotenuse.)

same B. Which one has the greatest vertical acceleration? (R or L?)

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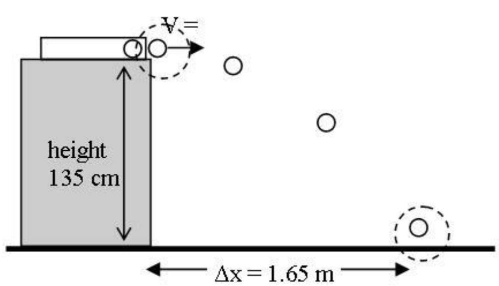
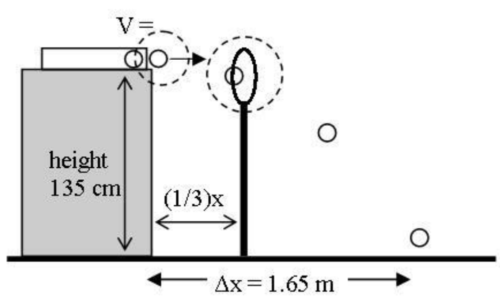


y-dir
$a = -g$
$v_i = 0$ m/s
$\Delta y = -1.35$ m
$\Delta y = v_i t + \frac{1}{2} a t^2$
$-1.35 = -4.9 t^2$
$t = .525$ sec -2w

x-dir
$S = \frac{D}{T}$
$= \frac{1.65}{.525}$
$= 3.14$ m/s -2w
(mmm, pie)

3. * Hoop 1 is placed at (1/3)x, where x is your original range. You need to find x and y for the hoop. Notice that one of the circles has been moved and that your initial conditions are the same as before.



A. What is (1/3)x? (*Put this in your x-direction information.)*

.55 m

B. * Solve for the time to Hoop 1.

$S = \frac{D}{T}$ $T = \frac{.55}{3.14} = .175$ sec -2w

C. Solve for Δy (*which is NOT the vertical position of the hoop*).

$v_i = 0$ m/s
$t = .175$ sec
$a = -g$

$\Delta y = v_i t - 4.9(.175)^2$
$\Delta y = -.15$ m -2w

D. Since $\Delta y = y_f - y_i$, solve for the vertical position of the hoop.

$-.15 = y_f - 1.35$ $y_f = -.15 + 1.35 = 1.2$ m

E. * So Hoop 1 is at what x and y position?

x = .55 m y = 1.2 m

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