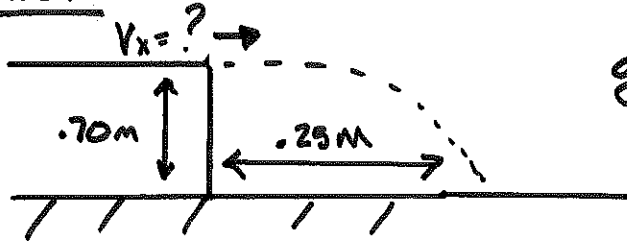


1) Given:



$$g = 9.81 \text{ m/s}^2$$

Find:  $V_x = ?$

Soln:

y-dir

$$\Delta y = V \sin \theta \Delta t - \frac{1}{2} g \Delta t^2$$

$$\Delta t = \sqrt{\frac{2 \Delta y}{-g}}$$

$$= \sqrt{\frac{2(-.70 \text{ m})}{-9.81 \text{ m/s}^2}}$$

$$\Delta t = .38 \text{ sec}$$

x-dir

$$V_x = \frac{\Delta x}{\Delta t}$$

$$V_x = \frac{.25 \text{ m}}{.38 \text{ sec}}$$

$V_x = .66 \text{ m/s}$

Notes

2 unknowns

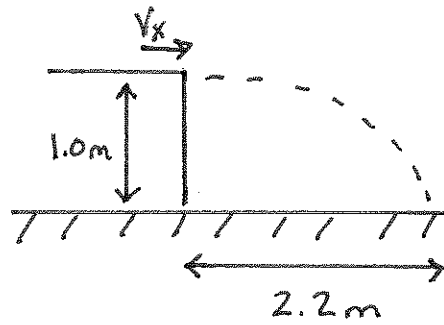
$$\sin \theta = 0$$

solve for  $\Delta t$

$$\Delta y = -.70 \text{ m}$$

(down)

2) Given:



$$g = 9.81 \text{ m/s}^2$$

$$\Delta y = -1.0 \text{ m}$$

$$\Delta x = 2.2 \text{ m}$$

Find:  $V_x = ?$

Soln:

y-dir

$$\Delta y = v_i \sin \theta \Delta t - \frac{1}{2} g \Delta t^2$$

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

$$\Delta t = \sqrt{\frac{2 \Delta y}{-g}}$$

x-dir  

$$v_x = \frac{\Delta x}{\Delta t}$$

Notes:

2 unknowns

$$\sin \theta = 0$$

solve for  $\Delta t$

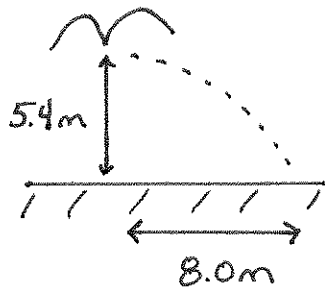
sub into

$$v_x = \Delta x \sqrt{\frac{-g}{2 \Delta y}}$$

$$= (2.2 \text{ m}) \sqrt{\frac{-9.81 \text{ m/s}^2}{2(-1.0 \text{ m})}}$$

$$\boxed{v_x = 4.9 \text{ m/s}}$$

#3 Given:



$$\Delta y = -5.4 \text{ m}$$

$$\Delta x = 8.0 \text{ m}$$

$$g = 9.81 \text{ m/s}^2$$

Find:  $v_x = ?$ Sol:y-dir

$$\Delta y = v_i \sin \theta - \frac{1}{2} g \Delta t^2$$

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

$$\Delta t = \sqrt{\frac{2 \Delta y}{-g}}$$

x-dir

$$v_x = \frac{\Delta x}{\Delta t}$$

$$v_x = \Delta x \sqrt{\frac{-g}{2 \Delta y}}$$

$$= (8.0 \text{ m}) \sqrt{\frac{(-9.81 \text{ m/s}^2)}{2(-5.4 \text{ m})}}$$

$$v_x = 7.6 \text{ m/s}$$

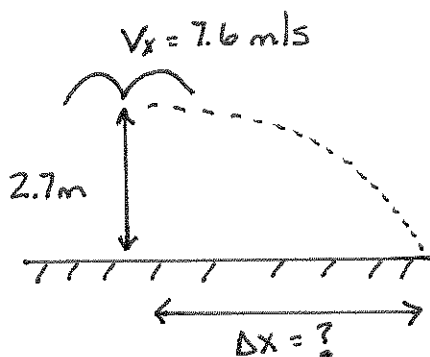
Notes

Zun knowns

$$\sin \theta = 0$$

solve for  $\Delta t$ 

sub in

#4 Given:

$$\Delta y = -2.7 \text{ m}$$

$$V_x = 7.6 \text{ m/s}$$

$$g = 9.81 \text{ m/s}^2$$

Find:  $\Delta x = ?$ Soln:y-dir

$$\Delta y = v_i \sin \theta - \frac{1}{2} g \Delta t^2$$

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

$$\Delta t = \sqrt{\frac{2\Delta y}{-g}}$$

x-dir  
$$V_x = \frac{\Delta x}{\Delta t}$$

$$\Delta x = V_x \Delta t$$

Notes

2 unknowns

$$\sin \theta = 0$$

sub in

$$\Delta x = V_x \sqrt{\frac{2\Delta y}{-g}}$$

$$= (7.6 \text{ m/s}) \sqrt{\frac{2(-2.7 \text{ m})}{(-9.81 \text{ m/s}^2)}}$$

$$\boxed{\Delta x = 5.6 \text{ m}}$$