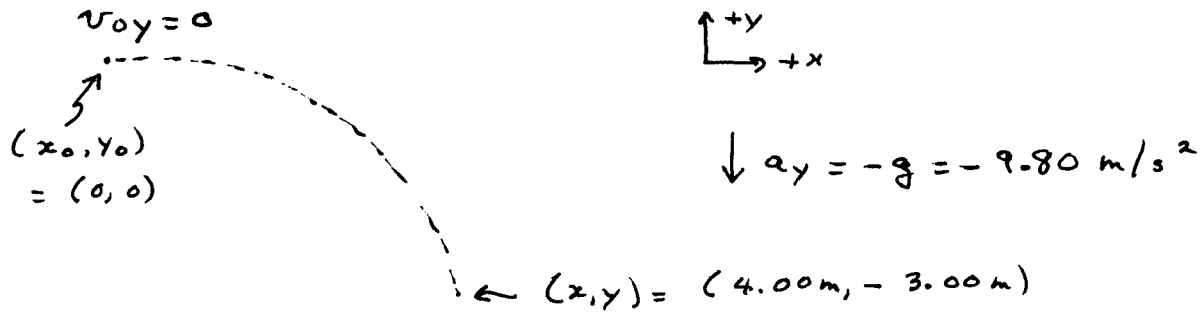


Exercise 7-14



First, find time in air:

$$y = y_0 + v_{0y}t + \frac{1}{2}a_y t^2$$
$$-3.00 = 0 + 0 - 4.90 t^2$$
$$\therefore t = 0.7825 \text{ s}$$

Then, $v_y = v_{0y} + a_y t$

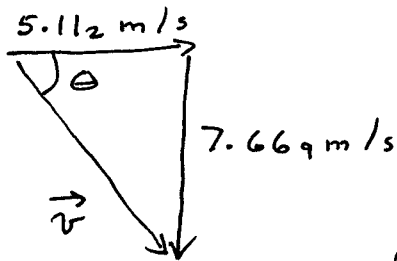
$$= 0 - (9.80 \text{ m/s}^2)(0.7825 \text{ s})$$
$$= -7.669 \text{ m/s}$$

To get v_x , use $x = x_0 + v_{0x}t + \frac{1}{2}a_x t^2$

\uparrow
 0

\uparrow
 $a_x = 0 \therefore v_x = v_{0x}$

$$\therefore v_x = v_{0x} = \frac{x}{t} = \frac{4.00 \text{ m}}{0.7825 \text{ s}} = 5.112 \text{ m/s}$$



$$v = \sqrt{(5.112)^2 + (7.669)^2} \text{ m/s}$$
$$= 9.22 \text{ m/s}$$

$$\theta = \tan^{-1}\left(\frac{7.669}{5.112}\right) = 56.3^\circ$$