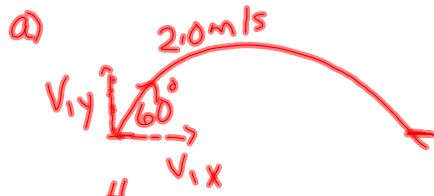


Ex. A juggler throws a ball from the left hand to the right hand at 2.0 m/s at 60° above the horizontal.

- Find the time the ball is in the air.
- How far apart should the juggler hold his hands?
- What is the maximum height of the ball?



$$v_{1x} = 2.0 \text{ m/s} \cos 60^\circ = 1.0 \text{ m/s}$$

$$t = ?$$

$$v_{1y} = 2.0 \text{ m/s} \sin 60^\circ = 1.7 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2$$

$$t = ?$$

$$v_{2y} = -1.7 \text{ m/s}$$

$$t = \frac{v_{2y} - v_{1y}}{a}$$

$$= \frac{-1.7 \text{ m/s} - 1.7 \text{ m/s}}{-9.8 \text{ m/s}^2}$$

$$t = 0.35 \text{ s}$$

b) $dx = ?$

$$dx = v_x t = (1.0 \text{ m/s})(0.35 \text{ s}) = 0.35 \text{ m}$$

c) $v_{2y} = 0$

$$v_{1y} = 1.7 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2$$

$$dy = ?$$

$$dy = \frac{v_{2y}^2 - v_{1y}^2}{2a}$$

$$dy = \frac{0 - (1.7 \text{ m/s})^2}{2(-9.8 \text{ m/s}^2)}$$

$$dy = 0.15 \text{ m}$$