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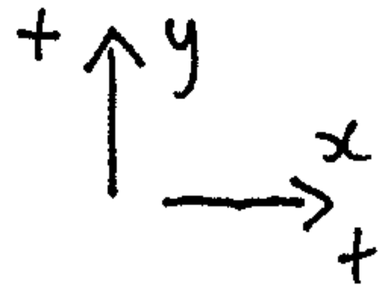
This is a problem involving momentum.

As a result of an impulse → an average force of 120 N acts on an object of mass 1.5 kg, in the x-direction, causing its velocity in the x-direction to reach 4.2 m/s. At the same time, an average force of 90 N acts on the object in the y-direction. If the initial velocity of the object in the x and y direction is 1.5 m/s and 0.6 m/s, respectively, what is the final speed of the object in the y-direction?

Solution:



$$J_x = m(v_{fx} - v_{ix}) = (1.5\,kg)(4.2\,m/s - 1.5\,m/s)$$
$$= \bar{F}_x \Delta t$$
$$\Rightarrow \Delta t = \frac{(1.5\,kg)(4.2\,m/s - 1.5\,m/s)}{\bar{F}_x}$$
$$\Rightarrow \Delta t = \frac{(1.5\,kg)(4.2\,m/s - 1.5\,m/s)}{120\,N}$$
$$\Rightarrow \Delta t = 0.03375\,s$$

Now, $J_y = m(v_{fy} - v_{iy}) = (1.5\,kg)(v_{fy} - 0.6\,m/s)$
$= \bar{F}_y \Delta t = (90\,N)(0.03375\,s)$
$\Rightarrow v_{fy} = 2.63\,m/s$ (answer)