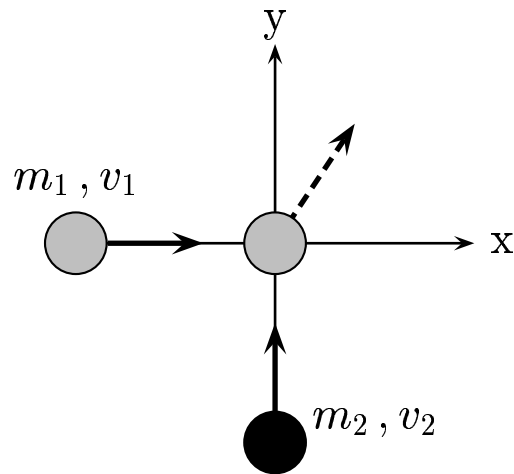


Consider the collision of two masses $m_1 = m_2 = m$. m_1 is moving along the positive x -direction with a speed $v_1 = 3v_0$. m_2 is moving along the positive y -direction with speed $v_2 = 4v_0$. After collision they stick together.



What is the final speed of the compound system?

A) $v_f = \frac{5}{2} v_0$.

B) $v_f = 5 v_0$.

C) $v_f = 7 v_0$.

D) $v_f = \frac{7}{2} v_0$.

$$p_x = m_1 v_1 = m 3 v_0$$

$$p_y = m_2 v_2 = m 4 v_0$$

$$\vec{p}_{cm} = \vec{p}_x + \vec{p}_y$$

$$\|\vec{p}_{cm}\| = \sqrt{p_x^2 + p_y^2}$$

$$= m v_0 \sqrt{3^2 + 4^2},$$

$$2 m v_f = 5 m v_0, \quad \text{and}$$

$$v_f = 5 \frac{v_0}{2}.$$

Answer **A**.