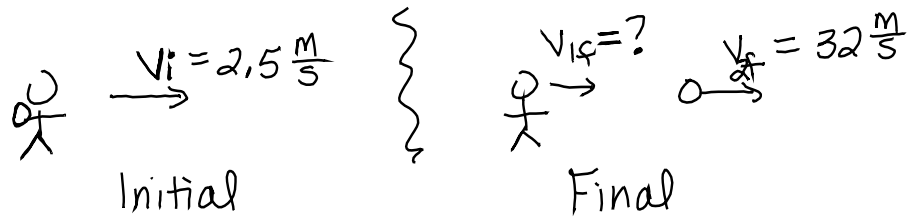


Momentum and Collisions Review (pp. 232-235)

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1 = Skater $m_1 = 65 \text{ kg}$
 2 = Snowball $m_2 = 0.15 \text{ kg}$

a) Conservation of Momentum:

$$m_1 v_{1i} + m_2 v_{2i} = m_1 v_{1f} + m_2 v_{2f}$$

\uparrow \uparrow
 v_i v_i

$$m_1 v_i + m_2 v_i = m_1 v_{1f} + m_2 v_{2f}$$

$$v_i (m_1 + m_2) = m_1 v_{1f} + m_2 v_{2f}$$

$-m_1 v_{1f}$ $-m_1 v_{1f}$

$$\boxed{\frac{v_i (m_1 + m_2) - m_1 v_{1f}}{m_2}} = \frac{m_2 v_{2f}}{m_2}$$

$$v_{2f} = \frac{v_i (m_1 + m_2) - m_1 v_{1f}}{m_2}$$

$$v_{2f} = \frac{(2.5 \frac{m}{s})(0.15 \text{ kg} + 65 \text{ kg}) - 65 \text{ kg}(32 \frac{m}{s})}{0.15 \text{ kg}}$$

$$\boxed{v_{2f} = 2.43 \frac{m}{s}, \text{ forward}}$$