

Answer on Question #72357-Physics-Other

3 kg ball traveling to the left at a velocity of 2.3 m/s collides with another 0.5 kg ball traveling to the left at 0.3 m/s. As a result of the collision the 3 kg ball moves to the left with a velocity of 1.73 m/s. Using the conservation of momentum calculate the velocity of the 0.5 kg ball after the collision.

Solution

Using the conservation of momentum

$$m_1 v_1 + m_2 v_2 = m_1 v_1' + m_2 v_2'$$

The velocity of the 0.5 kg ball after the collision is

$$v_2' = v_2 + \frac{m_2}{m_1} (v_1 - v_1')$$

$$v_2' = 0.3 + \frac{3}{0.5} (2.3 - 1.73) = 3.72 \frac{m}{s} \text{ to the left.}$$

Answer: $3.72 \frac{m}{s}$ to the left.

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