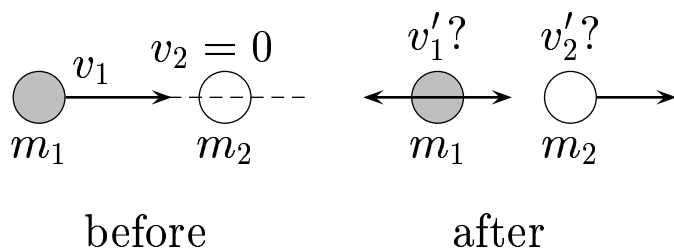


Given: A ball is approaching $m_2 = 2 m_1$ with a speed v_1 .



After an elastic collision, find the final velocities: v_1' and v_2' .

- A) $v_1' = \frac{-v_0}{3}$ and $v_2' = \frac{2 v_0}{3}$.
- B) $v_1' = \frac{v_0}{3}$ and $v_2' = \frac{v_0}{3}$.
- C) $v_1' = -v_0$ and $v_2' = \frac{v_0}{2}$.
- D) $v_1' = \frac{-v_0}{4}$ and $v_2' = \frac{v_0}{2}$.

The center-of-mass system,

$$\text{With } v_i' = 2 v_{cm} - v_i, \quad v_{cm} = \frac{m v_1}{3 m} = \frac{v_1}{3},$$

$$v_1' = \frac{2 v_0}{3} - v_0 = \frac{-v_0}{3},$$

Incorrect answers: The reader should check that:

- B corresponds to perfectly inelastic collision.
- C violates conservation of energy.
- D violates conservation of momentum.

Answer **A**.