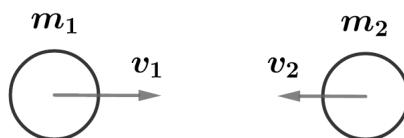


2018B F=ma Exam: Problem 9

Kevin S. Huang



$$m_1 v_1 - m_2 v_2 = 0$$

Since the total momentum is zero, we are in the center-of-mass frame. This means the final speeds must be the same as the initial speeds to conserve momentum and energy.

- A - does not conserve momentum
- B - does not conserve momentum or energy
- C - does not conserve energy since 3.0 kg ball moves directly south at 6.67 m/s
- D - does not conserve energy since 2.0 kg ball is at rest
- E - possible since 3.0 kg ball moves directly north at 10 m/s

Thus, the answer is E.