



Standardized Test Prep





MULTIPLE CHOICE

1. If a particle's kinetic energy is zero, what is its momentum?
A. zero
B. $1 \text{ kg} \cdot \text{m/s}$
C. $15 \text{ kg} \cdot \text{m/s}$
D. negative

2. The vector below represents the momentum of a car traveling along a road.



The car strikes another car, which is at rest, and the result is an inelastic collision. Which of the following vectors represents the momentum of the first car after the collision?

- F.** 
G. 
H. 
J. 

3. What is the momentum of a 0.148 kg baseball thrown with a velocity of 35 m/s toward home plate?
A. $5.1 \text{ kg} \cdot \text{m/s}$ toward home plate
B. $5.1 \text{ kg} \cdot \text{m/s}$ away from home plate
C. $5.2 \text{ kg} \cdot \text{m/s}$ toward home plate
D. $5.2 \text{ kg} \cdot \text{m/s}$ away from home plate

Use the passage below to answer questions 4–5.

After being struck by a bowling ball, a 1.5 kg bowling pin slides to the right at 3.0 m/s and collides head-on with another 1.5 kg bowling pin initially at rest.

4. What is the final velocity of the second pin if the first pin moves to the right at 0.5 m/s after the collision?
F. 2.5 m/s to the left
G. 2.5 m/s to the right
H. 3.0 m/s to the left
J. 3.0 m/s to the right
5. What is the final velocity of the second pin if the first pin stops moving when it hits the second pin?
A. 2.5 m/s to the left
B. 2.5 m/s to the right
C. 3.0 m/s to the left
D. 3.0 m/s to the right
6. For a given change in momentum, if the net force that is applied to an object increases, what happens to the time interval over which the force is applied?
F. The time interval increases.
G. The time interval decreases.
H. The time interval stays the same.
J. It is impossible to determine the answer from the given information.
7. Which equation expresses the law of conservation of momentum?
A. $p = mv$
B. $m_1 v_{1,i} + m_2 v_{2,i} = m_1 v_{1,f} + m_2 v_{2,f}$
C. $\frac{1}{2} m_1 v_{1,i}^2 + m_2 v_{2,i}^2 = \frac{1}{2} (m_1 + m_2) v_f^2$
D. $KE = p$