



Name: _____

Period: _____

Assigned on Monday, December 09, 2024

17.1 Introduction to Momentum Practice

Due Tuesday, December 10, 2024

1. A 3 kg object is moving with a velocity of 4 m/s. What is the momentum of the object?
2. A car with a mass of 1200 kg is traveling east at 15 m/s. Calculate its momentum, including the direction.
3. A 2 kg bowling ball moving at 3 m/s and a 0.5 kg tennis ball moving at 12 m/s collide with a wall. Which object has more momentum? Show your calculations.
4. A 1.5 kg soccer ball is initially stationary. A player kicks it, giving it a velocity of 10 m/s. What is the change in the ball's momentum?
5. A 10 kg cart moves at 5 m/s, while a 15 kg cart moves at 3 m/s in the same direction. What is the total momentum of the two-cart system?
6. Imagine two ice skaters standing on a frictionless ice surface. They push off each other and move in opposite directions. Skater A has a larger mass than Skater B. Describe how their velocities compare and explain why.
7. A truck is driving west and a car is driving east at the same speed.
 - a) How do their momenta compare?
 - b) If the two vehicles collide and stick together, what direction would the stuck cars move? Be specific.
8. A tennis ball and a bowling ball are both at rest. They are each hit by the same force for the same amount of time. Which object will have the greater change in velocity? Explain how this relates to momentum.

Extension:

9. A 2 kg cart moving at 3 m/s collides with a stationary 1 kg cart. After the collision, the 2 kg cart slows down to 1 m/s. What is the velocity of the 1 kg cart after the collision? Assume momentum is conserved.