

# Momentum and Impulse Practice #1

DIRECTIONS: Use the information you know about motion, momentum and impulse to answer the following questions. Show all of your work if math is required. Box in your answer and units are needed...

FORMULAS:  $p = mv$     $I = F\Delta t$     $\Delta p = F\Delta t$

1. Answer the following questions:

- a. What is the momentum of an 8-kg bowling ball rolling at 2 m/s?
  
  
  
  
  
  
  
  
  
  
- b. If the bowling ball rolls into a pillow and stops in 0.5 seconds, calculate the average force it exerts on the pillow.

2. Answer the following questions:

- a. What is the momentum of a 50-kg crate that slides at 4 m/s across an icy surface?
  
  
  
  
  
  
  
  
  
  
- b. The sliding crate skids onto a rough surface and stops in 3 seconds. Calculate the force of friction it encounters.

3. Answer the following questions:

- a. What impulse occurs when an average force of 10-N is exerted on a cart for 2.5 seconds?
  
  
  
  
  
  
  
  
  
  
- b. What change in momentum ( $\Delta p$ ) does the cart undergo?
  
  
  
  
  
  
  
  
  
  
- c. If the mass of the cart is 2 kilogram and the cart is initially at rest, calculate the final speed.

4. Answer the following questions:

- a. A 1.5-kilogram roller skate and a 900-kg truck both roll down a hill at 6.5 m/s. Calculate the momentum for each object.
  
  
  
  
  
  
  
  
  
  
- b. Looking at the answers from (4a), which object has more momentum? Explain why...