

Reflection and Self-Assessment**Completion:** Circle the statement that best describes the completion of this practice.

- I completed every question on the practice.
- I did not complete some questions on the practice because:

Answer Checking: Circle the statement that best describes how you checked your answers

- I checked all my answers against the key at the back and corrected any that were incorrect.
- I did not check all my answers and correct any mistakes because:

Online Worked Solution: Circle the statement that best describes how you used the online worked solutions.

- I did not use the online worked solution at all.
- I used the online solution to understand some questions I got incorrect.
- I used the online solution to help me learn how to answer some questions.

Confidence: Circle the statement that best describes your confidence in answering questions of this type in the future.

- I am confident I can answer nearly any question of this type correctly without using notes or other assistance.
- I am confident I can answer **MOST** questions of this type correctly without using notes or other assistance.
- I am **NOT** confident I can answer most questions of this type correctly without using notes or other assistance.

Time: Circle the statement below that best describes the total amount of time you spent actively working on this practice:

Less than an hour Between one and two hours Between two and three hours Between three and four hours More than four hours

1. The momentum of an object is $56 \frac{\text{kg}\cdot\text{m}}{\text{sec}}$.
 - a. What is the velocity of the object if it has mass of 2.0 kg?

 - b. What is the mass of the object if it has velocity of 7.0 m/s?

2. A 1200 kg car is travelling at 75 **km/hr** along a highway. What is the momentum of the car?
[1000 m = 1 km, 3600 sec = 1 hr]

3. Two objects (A and B) has the some momentum, but object A is travelling twice as fast as object B. How are the masses of the objects related?

4. A 5.5 kg object accelerates from rest at 8.3 m/s^2 . What is its momentum after 3.0 seconds?
5. An object has 56 J of kinetic energy.
- What is its momentum if it has velocity of 1.0 m/s?

 - What is its momentum if it has velocity of 2.0 m/s?
6. An object has momentum of $650 \frac{\text{kg}\cdot\text{m}}{\text{sec}}$. What is the kinetic energy of the object if it has mass of 25 kg?

7. A 0.500 kg ball is thrown straight up into the air at 12.3 m/s. What is the momentum of the ball 1.0 seconds after being thrown?

8. A 112 kg football player is running down the field at 3.6 m/s.

a) What impulse must a tackler make in order to stop the football player?

b) What force must the tackler exert to stop the player in 0.20 s?

c) What force must the tackler exert to stop the player in 4.0 s?

9. A 0.20 kg ball rolls at 2.5 m/s, it hits a wall and rebounds back at 2.5 m/s. What is the impulse imparted by the wall on the ball?

10. A puck of mass 0.20 kg is sliding along a smooth, flat section of ice at 18 m/s when it hits some snow. After 2.5 s of sliding through the snow, it returns to smooth ice travelling at 9.2 m/s.

a. What impulse is exerted on the puck by the snow?

b. What average force does the snow exert on the puck?

c. What is the coefficient of friction between the snow and the puck?

11. A 56 kg person jumps from a height of 1.3 m, when they land they bend their knees, taking 0.24 seconds to slow to a stop. What is the force acting on them while they slow to a stop?

12. The terminal velocity of a falling human is about 55 m/s. If a 65 kg sky driver were falling at that speed, and hit a net which slows them to a stop in 2.0 seconds, how much force would they experience?

13. A baseball player can hit a ball with about 3.0×10^4 N of force. This changes the 0.142 kg ball from travelling 35 m/s towards the player to 45 m/s away from the player. How long was the ball in contact with the bat?

Momentum and Impulse Practice

Name: _____

Answer Key				
1a) 28 m/s	1b) 8.0 kg	2) 25 000 $\frac{kg \cdot m}{sec}$	3) Mass of B is twice the mass of A	4) 140 $\frac{kg \cdot m}{sec}$
5a) 110 $\frac{kg \cdot m}{sec}$	5b) 56 $\frac{kg \cdot m}{sec}$	6) 8 500 J	7) 1.3 $\frac{kg \cdot m}{sec}$	8a) 4.0×10^2 Ns in opposite direction of runner's velocity
8b) 2.0×10^3 N in opposite direction of runner	8c) 1.0×10^2 N in opposite direction of runner	9) 1.0 Ns in direction away from the wall	10a) 1.8 Ns in direction opposite pucks velocity	10b) 0.70 N against the velocity of the puck
10c) 0.36	11) 1200 N	12) 1800 N	13) 3.8×10^{-4} seconds	