

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.

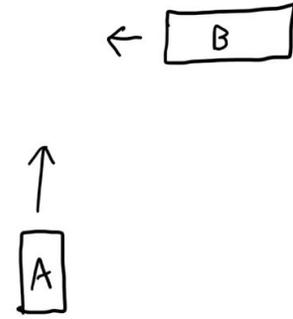
Confidence: Circle the statement that best describes your confidence in answering questions of this type in the future.

- 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
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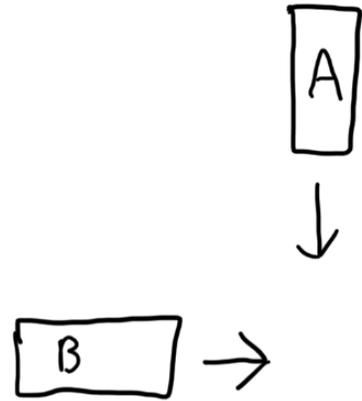
1. A 950 kg car (A) travelling North at 21 m/s collides with, and sticks to a 1200 kg car (B) travelling West at 14 m/s.



- What is the momentum of car A before the collision?
- What is the momentum of car B before the collision?
- What is the total momentum before the collision?
**You have to add the momentums as vectors.
- What is the total momentum after the collision?
- What is the total mass of the moving object after the collision?
- What is the velocity (magnitude and direction) of the combined cars after the collision?

2. Two 1250 kg cars collide, Car A was initially travelling at 6.5 m/s South, Car B was initially travelling 9.3 m/s East. After the collision, the cars merge and move together.

- a. What is the final velocity of the combined cars?



- b. How much kinetic energy was converted into other forms during the collision?

3. A 55 kg ball is moving at 65 m/s to the right when it collides with a stationary 24 kg ball. After the collision, the 24 kg ball is moving at 85 m/s, 18° above the right. What is the final velocity of the 55 kg ball?

4. A 25 kg bomb explodes into 2 pieces, a 16 kg piece flies away at 65 m/s, 18° North of West. What is the velocity of the other piece after the explosion?

5. A 2.0 kg ball moving due North at 7.0 m/s strikes a stationary 5.0 kg ball. After the collision, the 5.0 kg ball is moving at 1.1 m/s, 12° East of the North. What is the final velocity of the 2.0 kg ball?

6. A 6.3 kg block hits a stationary 7.5 kg block. After the collision, the 6.3 kg block is moving at 2.5 m/s, 18° North of East and the 7.5 kg block is moving at 3.2 m/s, 14° West of South. What was the initial velocity of the 6.3 kg block?

9. A 0.041 kg bullet is fired at 320 m/s and hits a stationary 10.0 kg slab of metal. The bullet ricochets back at an angle of 7.5° off its original path, the slab of metal moves at 1.8 m/s after the collision. What is the speed of the bullet after the collision?



2D Collision Practice

Name: _____

Answer Key				
1a) 2.0×10^4 $\frac{kg \cdot m}{sec}$ North	1b) 17 000 $\frac{kg \cdot m}{sec}$ West	1c) 26 000, 40° West of North	1d) 26 000, 40° West of North	1e) 2150 kg
1f) 12 m/s, 40° West of North	2a) 5.7 m/s, 55° East of South	2b) 4.0×10^4 J	3) 32 m/s, 21° below the right	4) 120 m/s, 18° South of East
5) 4.3 m/s, 7.5° West of North	6) 3.3 m/s, 26° East of South	7) West car was faster	8) They will move straight down	9) 120 m/s