ALBERTA PHYSICS 30 · UNIT A · 10 QUESTIONS

Momentum & Impulse — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **In a collision between two carts, the total kinetic energy of the carts after the collision is greater than their total kinetic energy before the collision. This can happen only if**

- **A** the collision was perfectly elastic
- **B** the two carts stuck together
- **C** stored energy, such as a compressed spring between the carts, was released
- **D** momentum was not conserved in the collision

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2 **A 0.20 kg ball falls and strikes the floor at 6.0 m/s, then rebounds directly upward at 5.0 m/s. The magnitude of the impulse delivered to the ball by the floor is**

- **A** 2.2 N · s
- **B** 0.20 N · s
- **C** 1.2 N · s
- **D** 11 N · s

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3 **A 0.30 kg ball moving at 8.0 m/s strikes a stationary ball of the same mass. After the collision the first ball moves at 2.0 m/s and the second ball moves at 6.0 m/s, both in the original direction. The kinetic energy lost in the collision is**

- **A** 0 J
- **B** 9.6 J
- **C** 3.6 J
- **D** 6.0 J

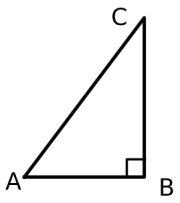
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4 **A 0.40 kg ball moving at 10 m/s undergoes an elastic collision with a stationary 0.60 kg ball. The first ball rebounds. Its speed immediately after the collision, in metres per second, to the nearest tenth, is _____**

ANSWER _____

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5 **The diagram shows the momentum triangle for the combined pucks. A 2.0 kg puck sliding east at 6.0 m/s collides with a 2.0 kg puck sliding north at 8.0 m/s. The pucks stick together. The speed and direction of the combined pucks immediately after the collision are**



A. 5.0 m/s, 37° north of east

B. 5.0 m/s, 53° north of east

C. 7.0 m/s, 53° north of east

D. 10 m/s, 37° north of east

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6 **A 3.0 kg block sliding east at 4.0 m/s collides with a 1.0 kg block sliding north at 4.0 m/s. The blocks stick together. The eastward component of the velocity of the combined blocks, in metres per second, to the nearest tenth, is ____**

ANSWER _____

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7 **A 2.0 kg cart moving at 6.0 m/s collides with a stationary cart and the two carts stick together, moving at 2.4 m/s after the collision. The mass of the second cart is**

A 1.2 kg

B 5.0 kg

C 7.2 kg

D 3.0 kg

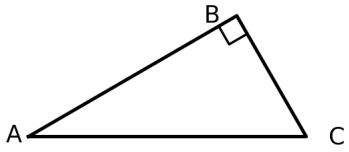
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8 **An 8.0 kg object at rest explodes into two pieces. A 3.0 kg piece flies off at 10 m/s. The kinetic energy of the remaining 5.0 kg piece, in joules, is ____**

ANSWER _____

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9 **The diagram shows the momentum triangle for the collision. A 0.25 kg ball moving east at 8.0 m/s undergoes an elastic collision with an identical stationary ball. After the collision, the first ball moves in a direction 30° north of east. The direction of the second ball immediately after the collision is**



- **A** 60° south of east
- **B** 30° south of east
- **C** 45° south of east
- **D** 60° north of east

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10 **A 12 kg shell is travelling east at 30 m/s when it bursts into two fragments. A 4.0 kg fragment continues east at 50 m/s. The velocity of the other fragment is**

- **A** 10 m/s east
- **B** 20 m/s east
- **C** 45 m/s east
- **D** 20 m/s west

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ANSWER KEY

1. C
2. A
3. C
4. 2
5. B
6. 3
7. D
8. 90
9. A
10. B

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