

## Momentum Quiz Review – Honors Physics

- 1 Momentum of a system is conserved only when \_\_\_\_\_.
- A there are no forces acting on the system.      C there are no internal forces acting on the system.
- B the system is not moving.      D there is no net external force acting on the system.
- 2 Suppose a girl is standing on a pond where there is no friction between her feet and the ice. In order to get off the ice, she can \_\_\_\_\_.
- A bend over touching the ice in front of her, then bring here feet to her hands.      C throw something in the opposite direction to that in which she wants to go.
- B walk very slowly on tiptoe.      D get on here hands and knees and crawl off the ice.
- 3 Compared to a sports car moving at 30 miles per hour, the same sports car moving at 60 miles per hour has \_\_\_\_\_.
- A four times as much momentum      C the same momentum
- B two times as much momentum      D half as much momentum
- 4 What two factors does momentum (p) depend on?
- A mass and weight      C weight and velocity
- B mass and velocity      D mass and acceleration
- 5 What type of collision occurs when two objects collide and stick together?
- A completely elastic      C elastic
- B partially elastic and partially inelastic      D inelastic
- 6 If two golf balls traveling at 2m/s collide, what will their velocity be after the collision?
- A 0 m/s      C 2 m/s in the same direction they were traveling
- B 1 m/s in the same opposite direction      D 2 m/s in the direction they came from
- 7 Which has more momentum, a 75,000 pound motor home traveling at 3 mph, or a 3,500 pound car traveling 70 mph?
- A motorhome      C both the same
- B car      D not enough information to tell
- 8 Two cars, one twice as heavy as the other, move down a hill at the same speed. Compared to that of the lighter car, the momentum of the heavier car is \_\_\_\_\_ as much.
- A twice      C four times
- B three times      D ten times

## Short Answer

- 1 How does momentum effect car crashes? (Give two examples from the video that was watched in class)
- 2 In the event of car crashes why might it be important for policemen to know the basic concepts of momentum?
- 3 List two careers that need to know the basic concepts of momentum to help them deal with car crashes?
- 4 Describe the two types of collisions, elastic and inelastic.
- 5 Explain the theory of conservation of momentum and give the equation used to solve these problems.
- 6 Explain what impulse (force times time) had to do with the egg drop lab performed in class?
- 7 A 70 kg astronaut is space walking outside the capsule when the tether line breaks. As a means of returning to the capsule he throws his 2 kg space wrench at a speed of 14 m/s away from the capsule. At what speed does the astronaut move towards the capsule?
- 8 A 0.06 kg tennis ball, initially moving at a speed of 12 m/s, is struck by a racket causing it to rebound in the opposite direction at a speed of 18 m/s. What is the change of momentum of the ball?

- 9 A 0.06 kg tennis ball, initially moving at a speed of 12 m/s, is struck by a racket causing it to rebound in the opposite direction at a speed of 18 m/s. A high speed movie film determines that the racket and ball are in contact for 0.05 seconds. What is the average net force exerted on the ball by the racket?
- 10 A 92 kg fullback running 5 m/s, attempts to dive across the goal line for a touchdown. Just as he reaches the goal line, he is met head on in mid-air by two 75 kg linebackers, one moving at 2 m/s and the other at 4 m/s. If they all become entangled as one mass, with what velocity do they travel? Does the fullback score?
- 11 A cat (5 kg) is standing on sled #1 (6 kg) that is at rest. The sled is on a frictionless ice pond. Sled #2 (6 kg), at rest, is one meter away from the first sled. The cat jumps with a velocity of 2 m/s from sled #1 to sled #2. The cat immediately after landing on sled #2 turns around and jumps back to sled #1 with a velocity of 2 m/s. What are the velocities of the two sleds after the cat has landed back on sled #1?
- 12 A 400 kg truck traveling at 18 m/s collides in an inelastic collision, where the vehicles stick together, with a 150 kg sports car traveling at 29 m/s. What is the final velocity of the two vehicles once they stick together.