



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

1 A **2.0-kilogram** cart moving due east at **6.0 meters per second** collides with a **3.0-kilogram** cart moving due west. The carts stick together and come to rest after the collision. **What was the initial speed of the 3.0-kilogram cart?**

A 1.0 m/s      C 9.0 m/s  
B 6.0 m/s      D 4.0 m/s

2 What is the **momentum** of a **1,200-kilogram** car traveling at **15 meters per second** due east?

A 80 kg•m/s due east  
B 80 kg•m/s due west  
C  $1.8 \times 10^4$  kg•m/s due east  
D  $1.8 \times 10^4$  kg•m/s due west

3 Two cars having **different weights** are traveling on a level surface at **different constant velocities**. Within the same time interval, **greater force** will always be required to stop the car that has the **greater**

A weight  
B kinetic energy

4 A **0.050-kilogram** bullet is fired from a **4.0-kilogram** rifle that is initially at rest. If the bullet leaves the rifle with momentum having a magnitude of **20 kilogram•meters per second**, the rifle will **recoil** with a momentum having a **magnitude of**

A 1.600 kg•m/s      C 20 kg•m/s

**PREVIEW**

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5 In physics, **momentum** is the product of an object's mass and its velocity. **Which of the following is the correct unit for momentum?**

A kg  
B kg•m/s  
C kg•m/s<sup>2</sup>  
D kg•m/s<sup>3</sup>

6 **the mosquito on the truck is**

A smaller  
B larger  
C the same

9 A **1.0-kilogram** rubber ball traveling east at **4.0 meters per second** hits a wall and **bounces back** toward the west at **2.0 meters per second**. Compared to the kinetic energy of the ball before it hits the wall, **the kinetic energy of the ball after it bounces off the wall is**

A one-fourth as great  
B one-half as great  
C the same  
D four times as great

10 As a spring is stretched, its **elastic potential energy**

A decreases  
B increases  
C remains the same



## ANSWER KEY

A **2.0-kilogram** cart moving due east at **6.0 meters per second** collides with a **3.0-kilogram** cart moving due west. The carts stick together and come to rest after the collision. **What was the initial speed of the 3.0-kilogram cart?**

- A 1.0 m/s
- B 6.0 m/s
- C 9.0 m/s
- D 4.0 m/s

(d)

What is the **momentum** of a **1,200-kilogram** car traveling at **15 meters per second** due east?

- A 80 kg•m/s due east
- B 80 kg•m/s due west
- C  $1.8 \times 10^4$  kg•m/s due east
- D  $1.8 \times 10^4$  kg•m/s due west

(c)

Two cars having **different weights** are traveling on a level surface at **different constant velocities**. Within the same time interval, **greater force will always be required to stop the car that has the greater**

- A weight
- B kinetic energy
- C velocity
- D mass



(d)

A **0.050-kilogram** bullet is fired from a **4.0-kilogram** rifle that is initially at rest. If the bullet leaves the rifle with momentum having a magnitude of **20 kilogram•meters per second**, the rifle will **recoil** with a momentum having a **magnitude of**

- A 1,600 kg•m/s
- B 80 kg•m/s
- C 20 kg•m/s
- D 0.25 kg•m/s

(c)



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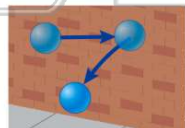
- A 32.0 kg•m/s
- B 64.0 kg•m/s
- C 128 kg•m/s
- D 256 kg•m/s

- A smaller
- B larger
- C the same



A **1.0-kilogram** rubber ball traveling east at **4.0 meters per second** hits a wall and **bounces back** toward the west at **2.0 meters per second**. Compared to the kinetic energy of the ball before it hits the wall, **the kinetic energy of the ball after it bounces off the wall is**

- A one-fourth as great
- B one-half as great
- C the same
- D four times as great



(a)

As a spring is stretched, its **elastic potential energy**

- A decreases
- B increases
- C remains the same



(b)