Momentum and Collisions

Phys Sci

Name _____ Class _____ Date _____

1 During a collision, an 84-kilogram driver of a car moving at 24 meters per second is brought to rest by an inflating air bag in 1.2 seconds. The magnitude of the **force exerted on the driver by the air bag** is approximately

A 7.0×10^1 N
B 8.2×10^2 N
C 1.7×10^3 N
D 2.0×10^3 N

2 Ball *A* of mass 5.0 kilograms moving at 20 meters per second collides with ball *B* of unknown mass moving at 10 meters per second in the same direction. After the collision, ball *A* moves at 10 meters per second and ball *B* at 15 meters per second, both still in the same direction.

What is the **mass** of **ball *B***?

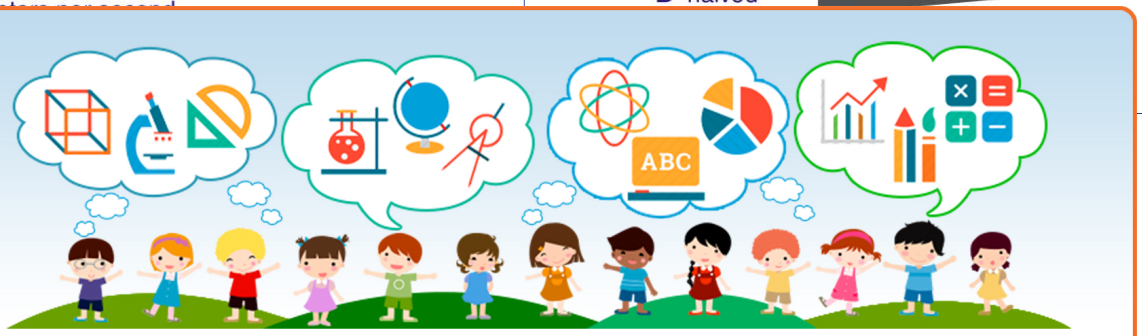
A 6.0 kg
B 2.0 kg
C 10 kg
D 12 kg

3 Which object has the **most** inertia?

A a 0.001-kilogram bumblebee traveling at 2 meters per second
B a 0.1-kilogram baseball traveling at 20 meters per second
C a 5-kilogram bowling ball traveling at

4 If the **speed** of a car is **doubled**, the **kinetic energy** of the car is

A quadrupled
B quartered
C doubled
D halved



5

7

A 20 J
B 41 J
C 120 J
D 240 J

C velocity
D displacement

9 An astronaut standing on a platform on the Moon drops a hammer. If the hammer falls **6.0 meters** vertically in **2.7 seconds**, what is its **acceleration**?

A 1.6 m/s^2
B 2.2 m/s^2
C 4.4 m/s^2
D 9.8 m/s^2

10 A 2.00-kilogram object weighs 19.6 newtons on Earth. If the **acceleration** due to gravity on Mars is 3.71 meters per second^2, what is the object's **mass** on **Mars**?

A 2.64 kg
B 2.00 kg
C 19.6 N
D 7.42 N

ANSWER KEY

During a collision, an 84-kilogram driver of a car moving at 24 meters per second is brought to rest by an inflating air bag in 1.2 seconds. The magnitude of the **force exerted on the driver by the air bag** is approximately

c

A 7.0×10^1 N
B 8.2×10^2 N
C 1.7×10^3 N
D 2.0×10^3 N

Ball *A* of mass 5.0 kilograms moving at 20 meters per second collides with ball *B* of unknown mass moving at 10 meters per second in the same direction. After the collision, ball *A* moves at 10 meters per second and ball *B* at 15 meters per second, both still in the same direction.

What is the **mass** of **ball *B***?

c

A 6.0 kg
B 2.0 kg
C 10 kg
D 12 kg

Which object has the **most** inertia?

d

A a 0.001-kilogram bumblebee traveling at 2 meters per second
B a 0.1-kilogram baseball traveling at 20 meters per second
C a 5-kilogram bowling ball traveling at 3 meters per second
D a 10-kilogram sled at rest

If the **speed** of a car is **doubled**, the **kinetic energy** of the car is

a

A quadrupled
B quartered
C doubled
D halved

A 20 J
B 41 J
C 120 J
D 240 J

D displacement

An astronaut standing on a platform on the Moon drops a hammer. If the hammer falls 6.0 meters vertically in 2.7 seconds, what is its **acceleration**?

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A 1.6 m/s^2
B 2.2 m/s^2
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A 2.00-kilogram object weighs 19.6 newtons on Earth. If the **acceleration** due to gravity on Mars is 3.71 meters per second^2, what is the object's **mass** on **Mars**?

a

A 2.64 kg
B 2.00 kg
C 19.6 N
D 7.42 N