

Impulse & Momentum

Name: _____

1) A baseball of mass 0.140 kg is moving at 35.0 m/s.

a) Find the momentum of the baseball.

b) Find the velocity of a 7.26 kg bowling ball that has the same momentum as the baseball.

2) A compact car with a mass of 725 kg is moving at 100 km/h.

a) Find its momentum

b) At what velocity is the momentum of a larger car, mass 2175 kg, equal to that of the smaller car?

3) A snowmobile has a mass of 250 kg. A constant force is exerted on it for 60.0 s. The snowmobile's initial and final velocities are 6.0 m/s and 28.0 m/s, respectively.

a) What is the snowmobile's change in momentum?

b) What is the force exerted on the snowmobile?

4) A 0.14 kg baseball is pitched horizontally at + 38 m/s. After the ball is hit by a bat, it moves horizontally at - 55 m/s.

a) What impulse did the bat deliver to the ball?

b) If the bat and ball were in contact for 18.0 ms, what was the average force the bat exerted on the ball?

c) Determine the average acceleration of the ball during its contact with the bat.

5) The brakes exert a 640 N force on a car weighing 15680 N and moving at 20 m/s. The car comes to a stop.

a) What is the car's mass?

b) What is the car's initial momentum?

c) What is the change in the car's momentum?

d) How long does the braking force act on the car to bring it to a halt?

Answers: 1b) 0.675 m/s 2a) 20100 N·s 3b) 91.7 N 4a) -13.0 N·s 4c) -5170 m/s²