

Name \_\_\_\_\_

Date \_\_\_\_\_

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## Momentum and More

1) An object has a mass of 20 kg and is moving at 5 m/s. What is the object's momentum?

2) A machine pushed a 40 kg object for 5 s using a force of 100 N. The object started at rest. What was the final speed of the object?

3) On a warehouse floor, a 60 kg box was sliding at 10 m/s. It slammed into a 35 kg box at rest. After the collision, the 60 kg box slowed down to 4 m/s. What was the speed of the 35 kg box after the collision?

4) A 1200 kg car was moving at 30 m/s. It crashed into a 1000 kg car that was moving at 25 m/s. After the collision, the bumpers of the two cars locked and they moved off as one. What was their speed?

Answers: 1) 100 kg m/s 2) 12.5 m/s 3) 10.3 m/s 4) 27.7 m/s

5) A projectile was fired horizontally from a height of 90.6 m. The initial speed of the projectile was 120 m/s. What was the range of the projectile?

6) A person is pushing a 25 kg box across a floor where  $\mu$  is 0.3. The person applies a force of 80 N. The box started at rest. How long will it take for the box to reach a speed of 4 m/s?

7) A satellite is orbiting at 350,000 m above the earth's surface. What is the orbital velocity of the satellite. Hint: You will need the mass of the earth and the radius of the earth to solve this. You can find this information on past assignments.

Answers: 5) 516 m 6) 15.4 s 7)  $7.7 \times 10^3$  m/s