**Chapter 7 Assignment 1**

1. You push a grocery cart with a force of 9 N for 1.5 s. What impulse do you deliver to the cart?

2. A 30. kg cart goes from a velocity of +0.5 m/s to a velocity of +3.5 m/s. How big was the impulse received by the cart?

3. A 3.0 kg object has been accelerated by a constant force of 12 N from a velocity of +10. m/s to a velocity of +18 m/s.

   (a) What impulse did the object receive?

   (b) For how long was the 12 N force acting on the object?

4. An object with a mass of 10 kg moves in a straight line with a velocity of +10 m/s. A constant force then acts on that object for 4.0 s, resulting in a velocity of −2 m/s.

   (a) Calculate the impulse received by the object.

   (b) What is the magnitude and direction of the force?

   (c) What is the momentum of the object before and after the force acts?