## **Chapter 5 Questions**

## **5.1 Section Review**

1. A force is any action that changes motion. For each of the following situations, identify what creates the force.

a. A flag flaps back and forth at the top of a flagpole.

- b. A soccer ball is passed from one player to another.
- c. A large piece of hail falls to the ground.

d. The tide goes from high to low at the shore (you might have to do a little research to get this one if you don't know already).

2. Which has more inertia—a shopping cart full of groceries or an empty shopping cart?



- 3. Four forces contribute to the net force on a car rolling on a ramp.
- a. Which force is the ramp supporting the car?
- b. Which force accelerates the car along the ramp?
- c. Which force acts against the motion of the car?

4. Imagine whirling a ball on a string over your head. Suppose the knot holding the ball comes loose and the ball is instantly released from the string. What path does the ball take after leaving the string? Use Newton's first law to explain your answer.



## **5.2 Section Review**

1. A 2 kg rabbit starts from rest and is moving at 6 m/s after 3 seconds. What force must the rabbit cause to makes this change in speed? (Figure 5.8)



2. Explain how changing force or mass affects the acceleration of an object. Provide one example to support your answer. 3. A tow truck pulls a 1,500-kilogram car with a net force of 4,000 newtons. What is the acceleration of the car?

4. A potato launcher uses a spring that can apply a force of 20 newtons to potatoes. A physics student launched a 100-gram potato, a 150-gram potato, and a 200-gram potato with the launcher. Which potato had the greatest acceleration?

5. An experiment measures the speed of a 250-kilogram motorcycle every 2 seconds (Figure 5.9). The motorcycle moves in a straight line. What is the net force acting on the motorcycle?



0 m/s	0 s
5 m/s	2 s
10 m/s	4 s
15 m/s	6 s
20 m/s	8 s

## **5.3 Section Review**

1. Emilio tries to jump to a nearby dock from a canoe that is floating in the water. Instead of landing on the dock, he falls into the water beside the canoe. Use Newton's third law to explain why this happened.

2. Two teams participate in a tug-of-war contest. Describe the action/reaction force pair that will determine who wins the contest. (Hint: action-reaction force pairs act on different objects.)

3. You push backward against the ground to move a skateboard forward. The force you make acts against the ground. What force acts against you to move you forward?

4. Explain why action-reaction forces do not cancel each other out, resulting in zero net force.

5. The engine of a jet airplane pushes fuel backward. That creates a force on the fuel. What pushes the jet forward?



Backward motion of exhaust

6. A child throws a small rubber ball at a heavier, larger basketball that is sitting still. The small ball bounces backward off the basketball. Describe the motion of the basketball after the small ball bounces back. Does it move at all? Does it move faster or slower than the small ball? What direction does it move? How does Newton's third law affect your answer?

