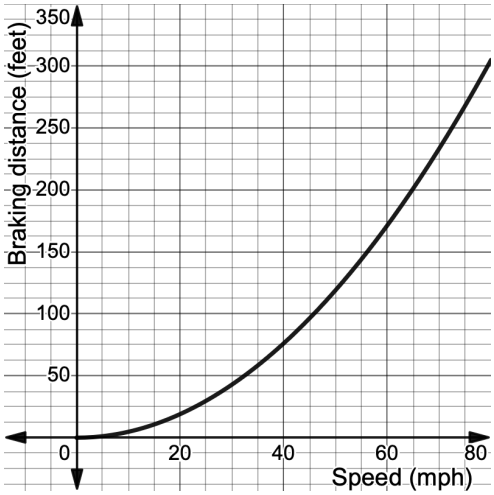
How Long Will It Take to Stop?

If you've ever been in a car when the driver slams on the brakes, you know that the car does not come to a stop immediately. Braking distance refers to the distance a vehicle will travel from the point when its brakes are fully applied to when it comes to a complete stop.

1. What factors do you think will affect a car's braking distance?

2. The graph shows the relationship between a car's speed and its braking distance. Some values are also given in the table below.



Speed (mph)	0	20	40	60	80
Braking distance (feet)	0	19	?	171	305

   a. What is the braking distance of a car driving 60 miles per hour?

   b. What is the braking distance of a car driving 40 miles per hour? How do you know?

3. The ordered pair (73, 254) is on this graph. What does this point tell you?

4. A car took 200 feet to come to a full stop. Estimate the speed at which the car was traveling before the brakes were applied.

5. Find $f(80)$ and interpret the meaning of this value in the context of this problem.

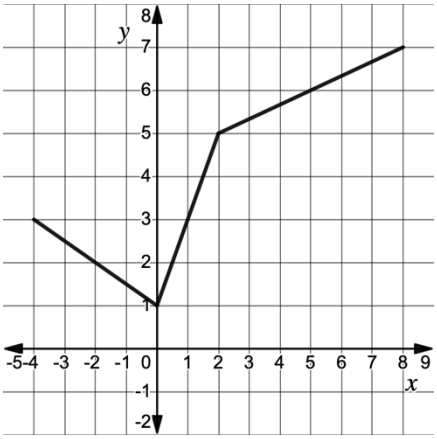
6. Use function notation to express that a car traveling 45 miles per hour will require a braking distance of 96 feet.

Lesson 5.1 – Using and Interpreting Function Notation

QuickNotes

Check Your Understanding

1. A graph of $y = f(x)$ is shown.



   a. Find $f(-2)$.

   b. Find $f(1)$.

   c. If $f(a) = 6$, find the value of a.

2. Let $N(t)$ represent the number of people in line at a BBQ food truck, t hours after the food truck opens. Interpret each of the following statements in context.

   a. $N(1) = 11$

   b. $N(0) = N(3)$

   c. $N(4) > N(6)$

   d. $N(R) = 34$

3. Physicists have discovered that there is a pattern, or rule, that can determine the braking distance based on the car's speed: take the car's speed, square it, and then divide the result by 21.

   a. Use this rule to predict the braking distance of a car traveling 90 mph.

   b. Write an equation for $f(s)$ that represents the car's braking distance when driving at a speed of s miles per hour.