Name_____ Date _____

Chapter 6 Fair Game Review

Find the missing value in the table.

1.

x	*y*
1	5
3	7
5	9
7	

2.

x	*y*
2	6
4	12
8	24
12	

3.

x	*y*
6	11
14	19
26	31
41	

4.

x	*y*
8	4
18	9
28	14
38	

5.

x	*y*
4	2.5
11	9.5
15	13.5
21	

6.

x	*y*
6	5.8
15	14.8
22.8	22.6
31.4	

Name _____ Date _____

Chapter 6

Fair Game Review (continued)

Evaluate the expression when $x = 2$, $y = 3$, and $z = -4$.

7. $3x - 2$

8. $-6 - 2y$

9. $2z^2$

10. $3y - 3z$

11. $\frac{8}{x} - 1$

12. $-1 + \frac{z}{2}$

Name_____ Date _____

6.1 Relations and Functions

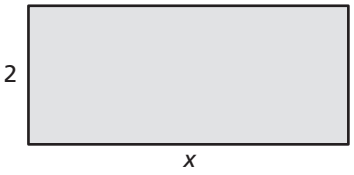
For use with Activity 6.1

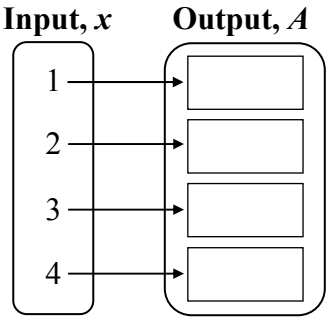
Essential Question How can you use a mapping diagram to show the relationship between two data sets?

1 ACTIVITY: Constructing Mapping Diagrams

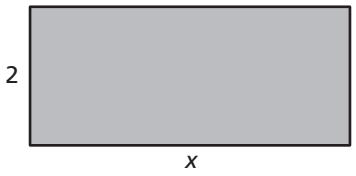
Work with a partner. Complete the mapping diagram.

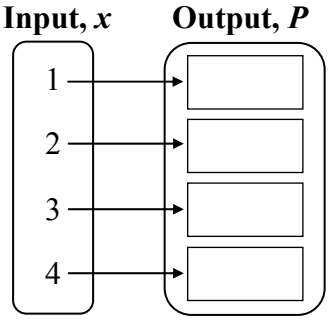
a. Area A



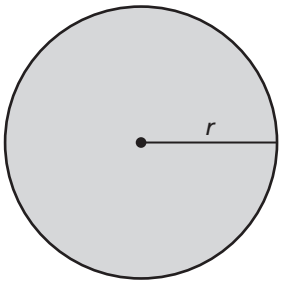


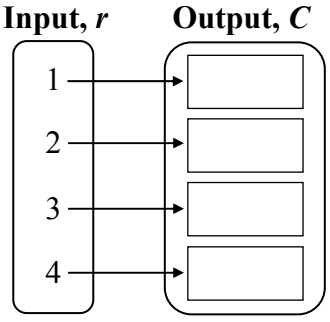
b. Perimeter P



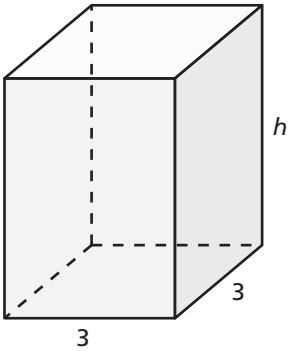


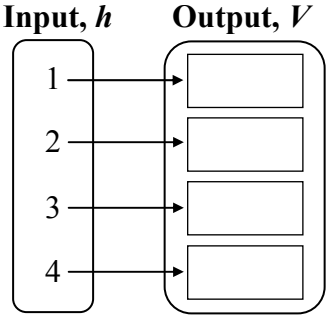
c. Circumference C





d. Volume V



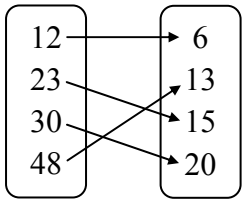


6.1 Relations and Functions (continued)

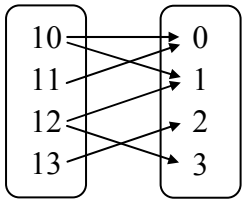
2 ACTIVITY: Describing Situations

Work with a partner. How many outputs are assigned to each input? Describe a possible situation for each mapping diagram.

a. Input, x Output, y



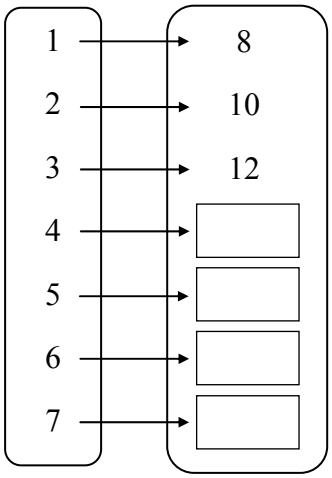
b. Input, x Output, y



3 ACTIVITY: Interpreting Mapping Diagrams

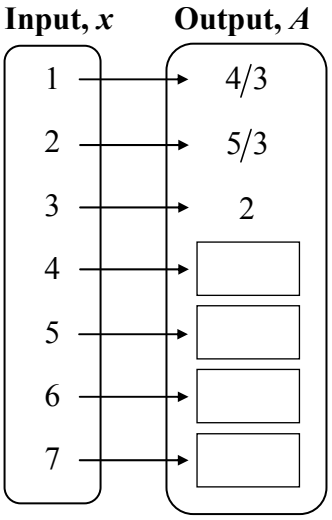
Work with a partner. Describe the pattern in the mapping diagram. Complete the diagram.

a. Input, t Output, M



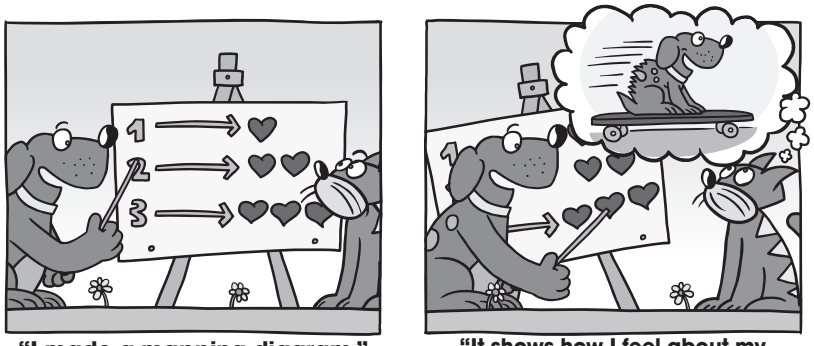
6.1 Relations and Functions (continued)

b.



What Is Your Answer?

4. IN YOUR OWN WORDS How can you use a mapping diagram to show the relationship between two data sets?



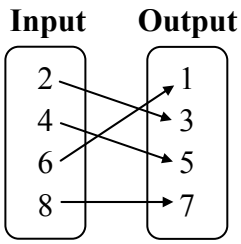
Name _____ Date _____

6.1 Practice

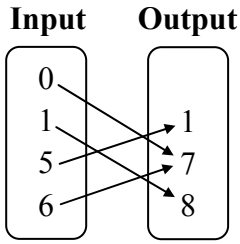
For use after Lesson 6.1

List the ordered pairs shown in the mapping diagram.

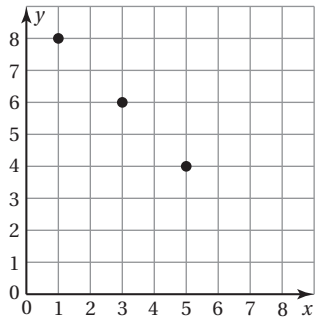
1.



2.



3. Draw a mapping diagram for the graph. Then describe the pattern of inputs and outputs.



4. The table shows the number of beads needed to make a bracelet. Use the table to draw a mapping diagram.

Bracelet Length (in.)	Number of Beads
6	12
7	14
8	16
9	18

Name_____ Date _____

6.2 Representations of Functions

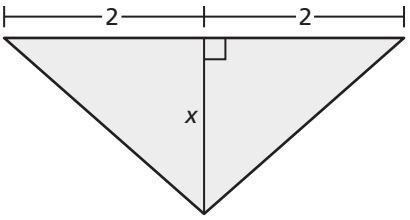
For use with Activity 6.2

Essential Question How can you represent a function in different ways?

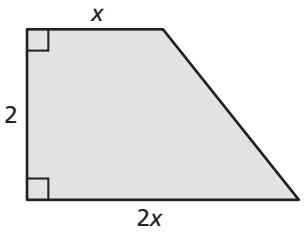
1 ACTIVITY: Describing a Function

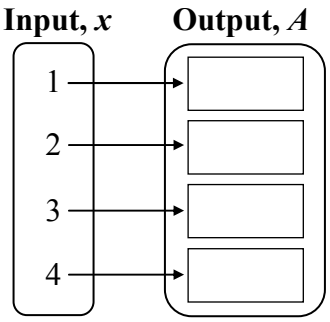
Work with a partner. Complete the mapping diagram on the next page for the area of the figure. Then write an equation that describes the function.

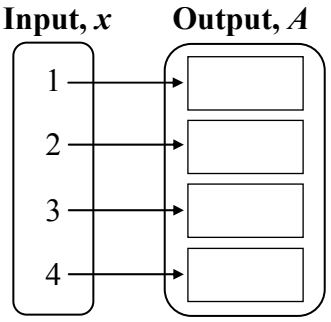
a.



b.





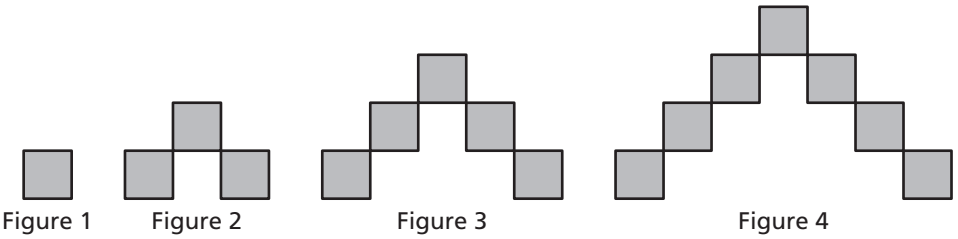


2 ACTIVITY: Using a Table

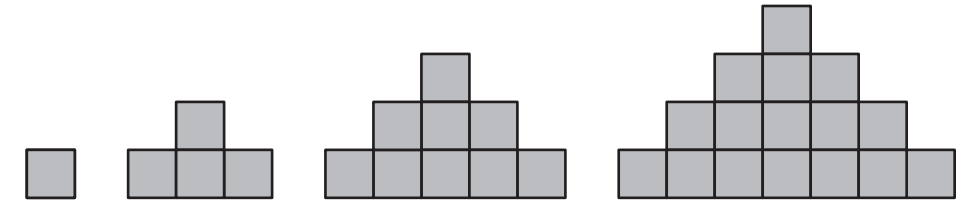
Work with a partner. Make a table that shows the pattern for the area, where the input is the figure number x and the output is the area A. Write an equation that describes the function. Then use your equation to find which figure has an area of 81 when the pattern continues.

1 square unit

a.



b.

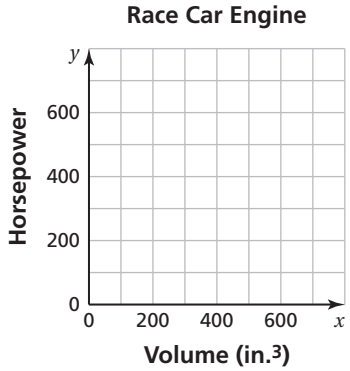


3 ACTIVITY: Using a Graph

Work with a partner. Graph the data. Use the graph to test the truth of each statement. If the statement is true, write an equation that shows how to obtain one measurement from the other measurement.

a. "You can find the horsepower of a race car engine if you know its volume in cubic inches."

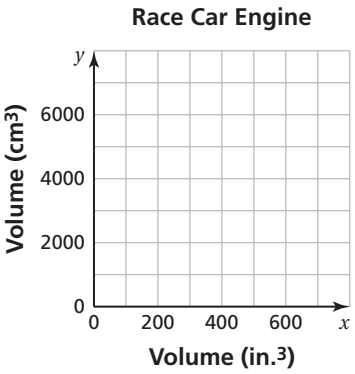
Volume (cubic inches), *x*	200	350	350	500
Horsepower, *y*	375	650	250	600



6.2 Representations of Functions (continued)

b. "You can find the volume of a race car engine in cubic centimeters if you know its volume in cubic inches."

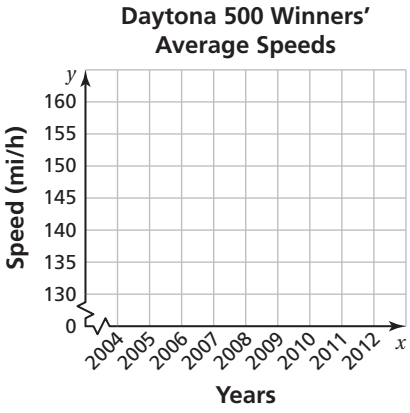
Volume (cubic inches), x	100	200	300
Volume (cubic centimeters), y	1640	3280	4920



4 ACTIVITY: Interpreting a Graph

Work with a partner. The table shows the average speeds of the winners of the Daytona 500. Graph the data. Can you use the graph to predict future winning speeds? Explain why or why not.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Speed (mi/h)	156	135	143	149	153	133	137	130	140



What Is Your Answer?

5. IN YOUR OWN WORDS How can you represent a function in different ways?

Name _____ Date _____

6.2 Practice

For use after Lesson 6.2

Write a function rule for the statement.

1. The output is four times the input.

2. The output is eight less than the input.

Find the value of *y* for the given value of *x*.

3. $y = \frac{x}{3}; x = 12$

4. $y = 5x + 9; x = 2$

5. You set up a hot chocolate stand at a football game. The cost of your supplies is \$75. You charge \$0.50 for each cup of hot chocolate.

a. Write a function that represents the profit P for selling c cups of hot chocolate.

b. You will *break even* when the cost of your supplies equals your income. How many cups of hot chocolate must you sell to break even?

Name_____ Date _____

6.3 Linear Functions

For use with Activity 6.3

Essential Question How can you use a function to describe a linear pattern?

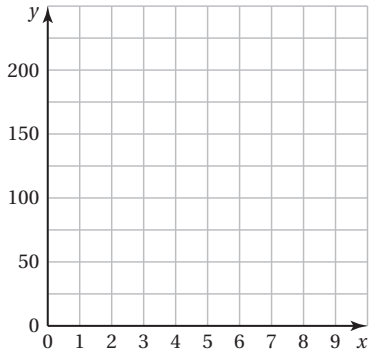
1 ACTIVITY: Finding Linear Patterns

Work with a partner.

- **Plot the points from the table in a coordinate plane.**
- **Write a linear equation for the function.**

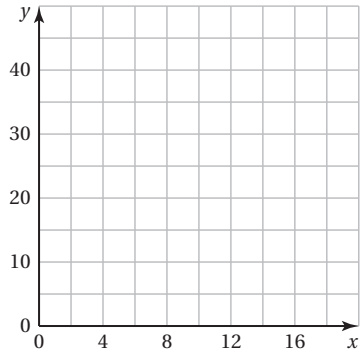
a.

x	0	2	4	6	8
y	150	125	100	75	50



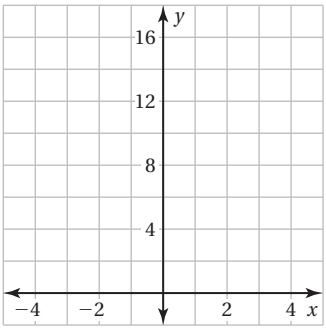
b.

x	4	6	8	10	12
y	15	20	25	30	35



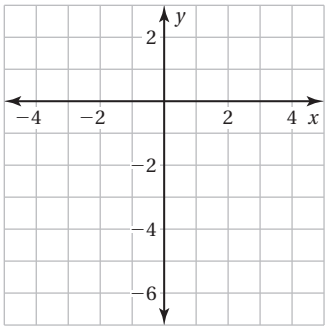
c.

x	–4	–2	0	2	4
y	4	6	8	10	12



d.

x	–4	–2	0	2	4
y	1	0	–1	–2	–3



6.3 Linear Functions (continued)

2 ACTIVITY: Finding Linear Patterns

Work with a partner. The table shows a familiar linear pattern from geometry.

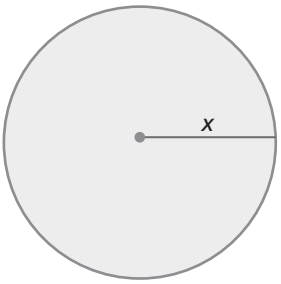
- **Write a function that relates y to x.**
- **What do the variables x and y represent?**
- **Graph the function.**

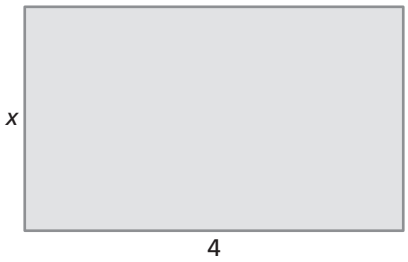
a.

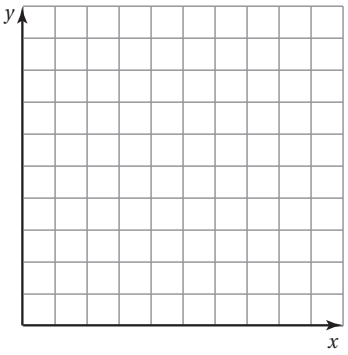
x	1	2	3	4	5
y	2π	4π	6π	8π	10π

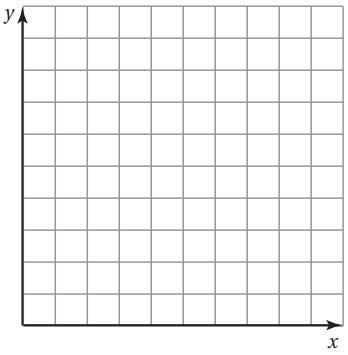
b.

x	1	2	3	4	5
y	10	12	14	16	18







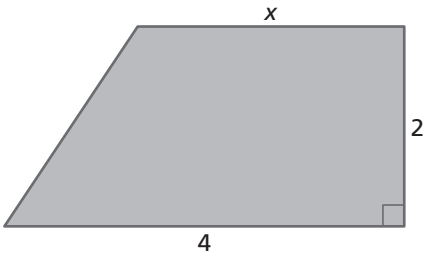


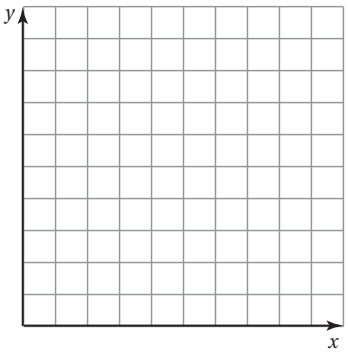
Name_____ Date _____

6.3 Linear Functions (continued)

c.

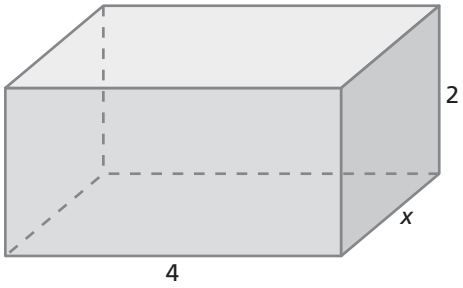
x	1	2	3	4	5
y	5	6	7	8	9

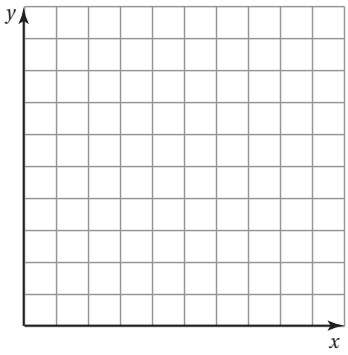




d.

x	1	2	3	4	5
y	28	40	52	64	76





What Is Your Answer?

3. IN YOUR OWN WORDS How can you use a function to describe a linear pattern?

4. Describe the strategy you used to find the functions in Activities 1 and 2.

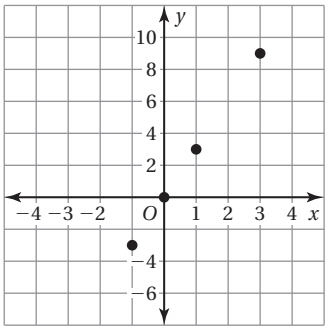
Name _____ Date _____

6.3 Practice

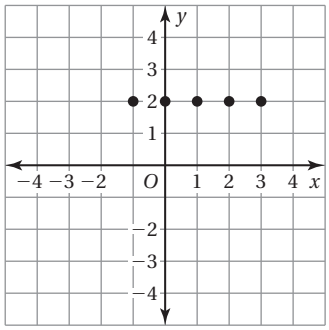
For use after Lesson 6.3

Use the graph or the table to write a linear function that relates *y* to *x*.

1.



2.



3.

x	0	1	2	3
y	5	7	9	11

4.

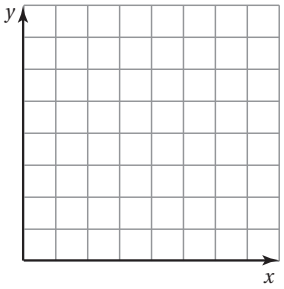
x	–2	0	2	4
y	–1	–2	–3	–4

5. The table shows the distance traveled *y* (in miles) after *x* hours.

x	0	2	4	6
y	0	120	240	360

a. Write a linear function that relates *y* to *x*.

b. Graph the linear function.



c. What is the distance traveled after three hours?

Name_____ Date _____

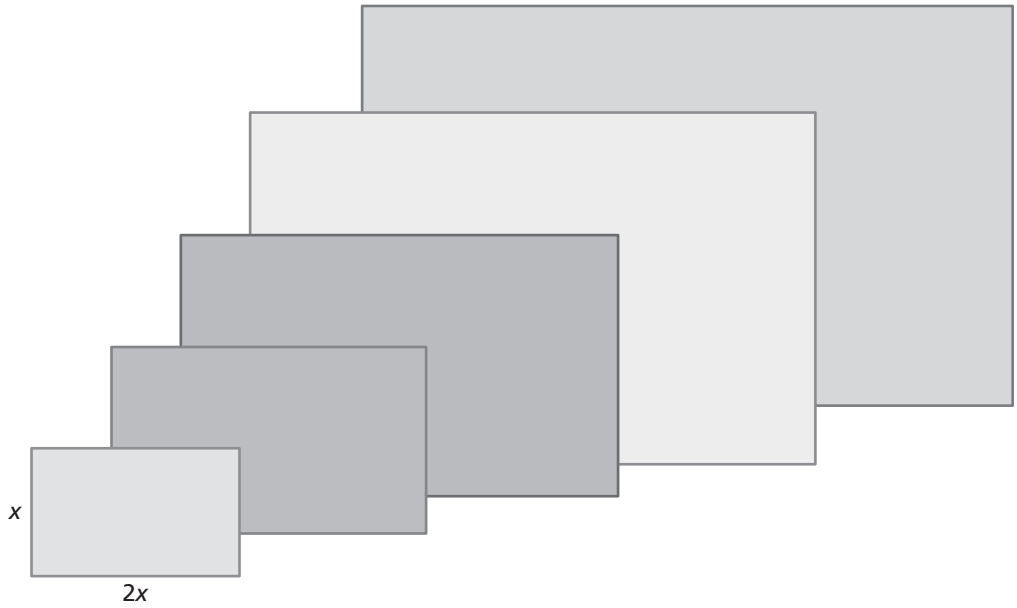
6.4 Comparing Linear and Nonlinear Functions

For use with Activity 6.4

Essential Question How can you recognize when a pattern in real life is linear or nonlinear?

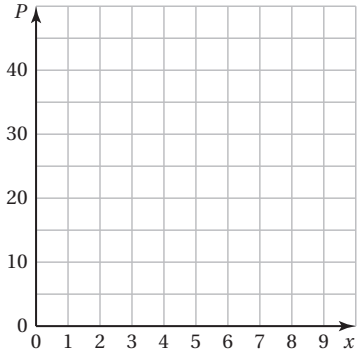
1 ACTIVITY: Finding Patterns for Similar Figures

Work with a partner. Complete each table for the sequence of similar rectangles. Graph the data in each table. Decide whether each pattern is linear or nonlinear.



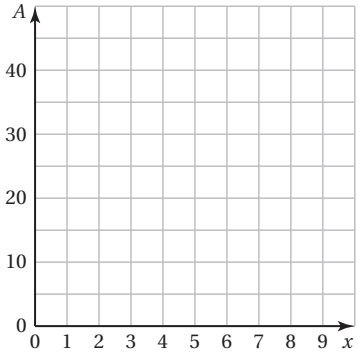
a. Perimeters of similar rectangles

x	1	2	3	4	5
P					



b. Areas of similar rectangles

x	1	2	3	4	5
A					



Name _____ Date _____

6.4 Comparing Linear and Nonlinear Functions (continued)

2 ACTIVITY: Comparing Linear and Nonlinear Functions

Work with a partner. Each table shows the height *h* (in feet) of a falling object at *t* seconds.

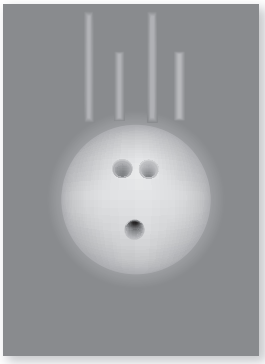
- **Graph the data in each table.**
- **Decide whether each graph is linear or nonlinear.**
- **Compare the two falling objects. Which one has an increasing speed?**

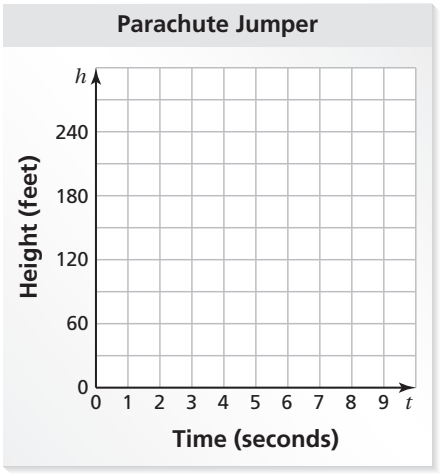
a. Falling parachute jumper

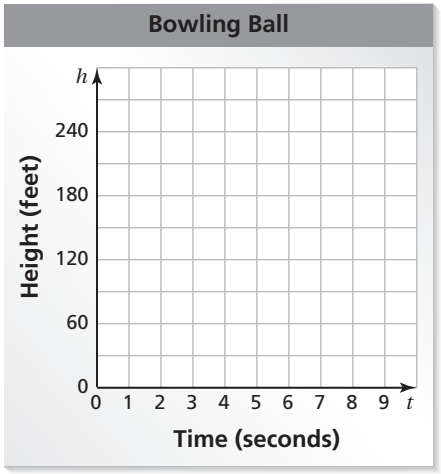
t	0	1	2	3	4
h	300	285	270	255	240

b. Falling bowling ball

t	0	1	2	3	4
h	300	284	236	156	44







6.4 Comparing Linear and Nonlinear Functions (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you recognize when a pattern in real life is linear or nonlinear? Describe two real-life patterns: one that is linear and one that is nonlinear. Use patterns that are different from those described in Activities 1 and 2.

Name _____ Date _____

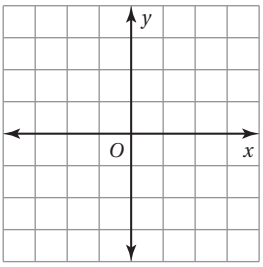
6.4 Practice

For use after Lesson 6.4

Graph the data in the table. Decide whether the graph is *linear* or *nonlinear*.

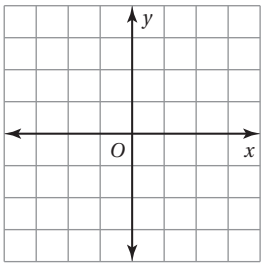
1.

x	–2	0	2	4
y	4	0	4	16



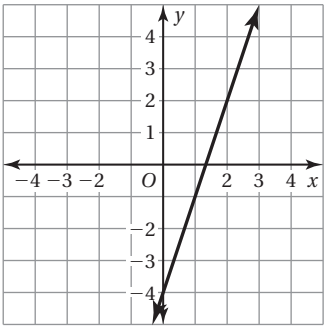
2.

x	–1	0	1	2
y	–1	1	3	5

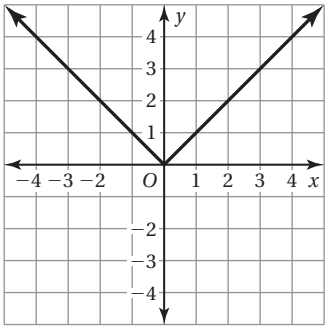


Does the graph represent a *linear* or nonlinear *function*? Explain.

3.



4.



5. The table shows the area of a square with side length x inches. Does the table represent a linear or nonlinear function? Explain.

Side Length, *x*	1	2	3	4
Area, *A*	1	4	9	16

Name_____ Date _____

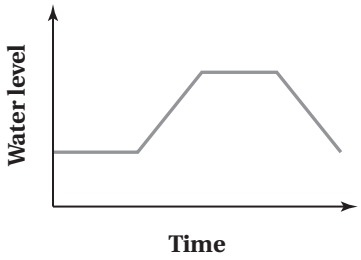
6.5 Analyzing and Sketching Graphs

For use with Activity 6.5

Essential Question How can you use a graph to represent relationships between quantities without using numbers?

1 ACTIVITY: Interpreting a Graph

Work with a partner. Use the graph shown.



a. How is this graph different from the other graphs you have studied?

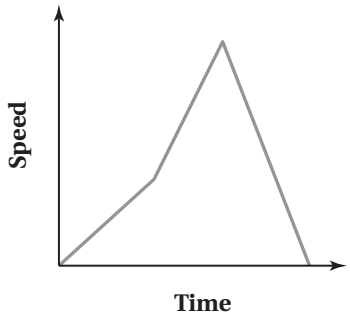
b. Write a short paragraph that describes how the water level changes over time.

c. What situation can this graph represent?

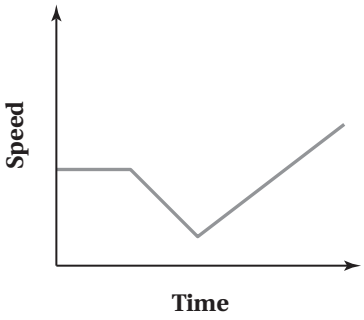
2 ACTIVITY: Matching Situations to Graphs

Work with a partner. You are riding your bike. Match each situation with the appropriate graph. Explain your reasoning.

A.

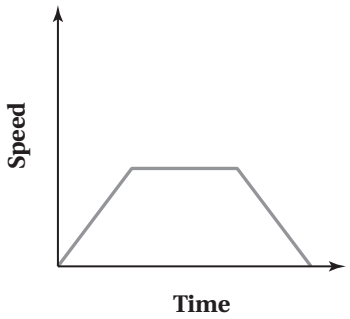


B.

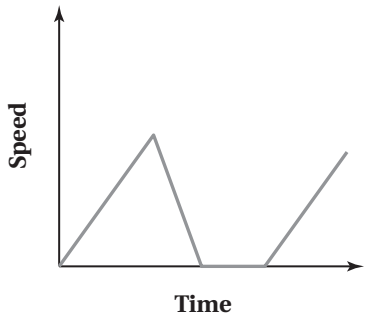


6.5 Analyzing and Sketching Graphs (continued)

C.



D.



a. You gradually increase your speed, then ride at a constant speed along a bike path. You then slow down until you reach your friend's house.

b. You gradually increase your speed, then go down a hill. You then quickly come to a stop at an intersection.

c. You gradually increase your speed, then stop at a convenience store for a couple of minutes. You then continue to ride, gradually increasing your speed.

d. You ride at a constant speed, then go up a hill. Once on top of the hill, you gradually increase your speed.

3 ACTIVITY: Comparing Graphs

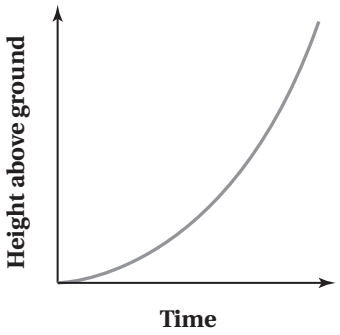
Work with a partner. The graphs represent the heights of a rocket and a weather balloon after they are launched.

a. How are the graphs similar? How are they different? Explain.

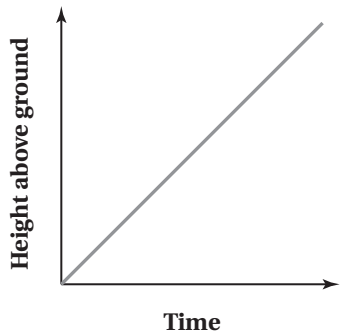
b. Compare the steepness of each graph.

c. Which graph do you think represents the height of the rocket? Explain.

Graph A



Graph B



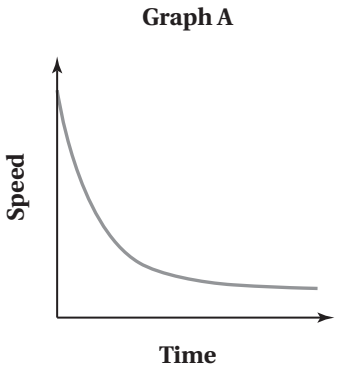
Name_____ Date _____

6.5 Analyzing and Sketching Graphs (continued)

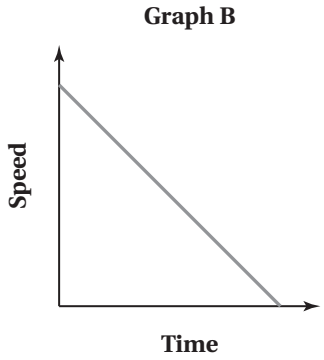
4 ACTIVITY: Comparing Graphs

Work with a partner. The graphs represent the speeds of two cars. One car is approaching a stop sign. The other car is approaching a yield sign.

a. How are the graphs similar? How are they different? Explain.



b. Compare the steepness of each graph.

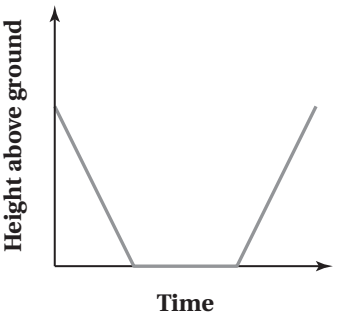


c. Which graph do you think represents the car approaching a stop sign? Explain.

What Is Your Answer?

5. IN YOUR OWN WORDS How can you use a graph to represent relationships between quantities without using numbers?

6. Describe a possible situation represented by the graph shown.



7. Sketch a graph similar to the graphs in Activities 1 and 2. Exchange graphs with a classmate and describe a possible situation represented by the graph. Discuss the results.

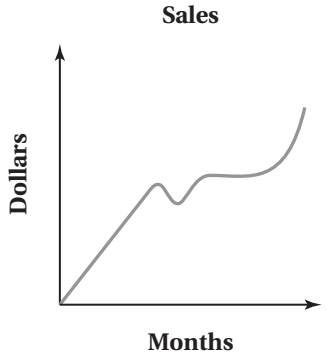
Name _____ Date _____

6.5 Practice

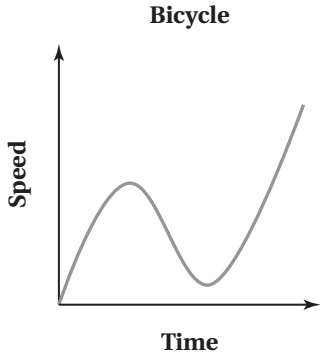
For use after Lesson 6.5

Describe the relationship between the two quantities.

1.



2.



Sketch a graph that represents the situation.

3. You are texting a friend at a constant rate. You send the message then wait for a response. Once you receive a response, you begin texting a reply at a constant rate.

4. You cut your fingernails, let the nails grow back, and then cut them again.