Interactive Classroom

Glencoe McGraw-Hill

Pre-Algebra

Chapter 7
Functions and Graphing

Click the mouse button or press the space bar to continue.

Chapter Menu

Lesson 7-1 Functions

Lesson 7-2 Representing Linear Functions

Lesson 7-3 Rate of Change

Lesson 7-4 Constant Rate of Change and Direct Variation

Lesson 7-5 Slope

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Lesson 7-7 Writing Linear Equations

Lesson 7-8 Prediction Equations

Lesson Menu

Five-Minute Check (over Chapter 6)

Main Idea and Vocabulary

Example 1: Ordered Pairs and Tables as Functions

Example 2: Use a Graph to Identify Functions

Example 3: Real-World Example

Main Ideas

- Determine whether relations are functions.
- Use functions to describe relationships between two quantities.

New Vocabulary

- function
- vertical line test

EXAMPLE 1 Ordered Pairs and Tables as Functions

A. Determine whether the relation is a function. Explain.

$\{(-3, -3), (-1, -1), (0, 0), (-1, 1), (3, 3)\}$

Answer: No; –1 in the domain is paired with both –1 and 1 in the range.

EXAMPLE 1 Ordered Pairs and Tables as Functions

B. Determine whether the relation is a function. Explain.

x	7	6	5	2	−3	−6
y	2	4	6	4	2	−2

Answer: Yes; each x value is paired with only one y value.

CHECK Your Progress

1 A. Determine whether each relation is a function. Explain.

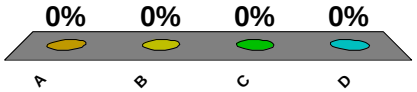
{(2, 5), (4, –1), (3, 1), (6, 0), (–2, –2)}

A. Yes; each *x* value is paired with only one *y* value.

B. No; –2 is in the domain and in the range.

C. No; 2 in the domain is paired with 5 and –2 in the range.

D. no; not a relation



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CHECK Your Progress

1 **B.**

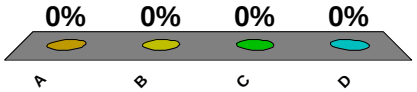
x	3	1	−1	−3	1	−5
y	5	4	3	−4	2	1

A. Yes; each *x* value is paired with only one *y* value.

B. No; 1 is in the domain and in the range.

C. No; 1 in the domain is paired with 4 and 2 in the range.

D. no; not a relation



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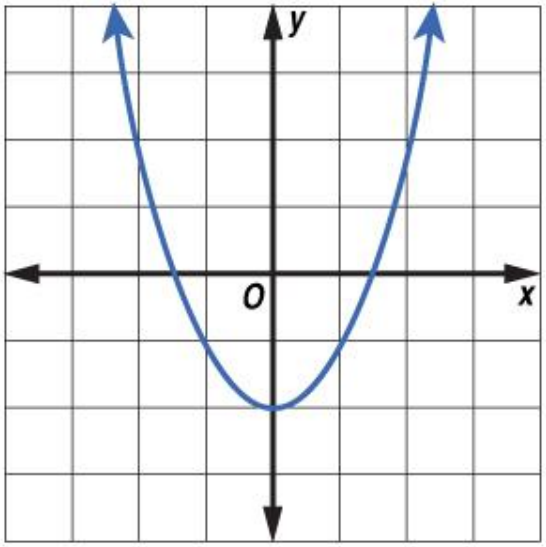
EXAMPLE Use a Graph to Identify Functions

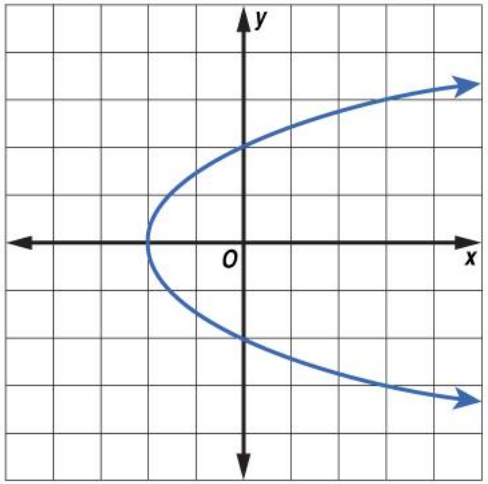
2 **Determine whether the graph is a function. Explain.**



Answer: Yes; it passes the vertical line test.

CHECK Your Progress

2 Determine whether the graph is a function. Explain.



A. Yes; it passes the vertical line test.

B. Yes; each *y* value is paired with two *x* values.

C. No; it does not pass the vertical line test.

D. cannot be determined without specific ordered pairs

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Real-World EXAMPLE

3 **A. BUSINESS** **The table shows the number of boxes made.**

Number of Hours	Number of Boxes
0	0
10	3000
20	6000
30	9000

Do these data represent a function? Explain.

Answer: Yes; for each 10 hours, only one amount of boxes is made.

Real-World EXAMPLE

3 **B. Describe how box production is related to hours of operation.**

Number of Hours	Number of Boxes
0	0
10	3000
20	6000
30	9000

Answer: As the number of hours increases, the number of boxes produced increases.

CHECK Your Progress

3 **A. BUSINESS** The table shows the number of chairs made. Do these data represent a function? Explain.

Number of Hours	Number of Chairs
5	120
10	240
15	360
20	480

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A. Yes; each domain value is paired with only one range value.

B. Yes; there are two range values for one domain value.

C. No; there is one range value for each domain value.

D. No; a domain value is paired with two range values.

A B C D

CheckPoint

CHECK Your Progress

3 **B. BUSINESS** The table shows the number of chairs made. Describe how chair production is related to hours of operation.

Number of Hours	Number of Chairs
5	120
10	240
15	360
20	480

A. As hours decrease, the number of chairs increases.

B. As hours increase, the number of chairs increases.

C. As hours increase, the number of chairs decreases.

D. Chair production is not related to hours of operation.

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End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-1)

Main Ideas and Vocabulary

Example 1: Use a Table of Ordered Pairs

Example 2: Solve an Equation for *y*

Example 3: Graph a Linear Equation

Concept Summary: Representing Functions

Main Ideas

- Solve linear equations with two variables.
- Graph linear equations using ordered pairs.

New Vocabulary

- linear equation

Concepts in MOtion

Interactive Lab: Graphing Equations with Two Variables

Click here to view!

EXAMPLE Use a Table of Ordered Pairs

1 **Find four solutions of $y = 4x + 3$.**

Choose four values for x. Then substitute each value into the equation to solve for y. There are many possible solutions. The solutions you find depend on which x values you choose.

x	$y = 4x + 3$	y	(x, y)
0	$y = 4(0) + 3$	3	(0, 3)
1	$y = 4(1) + 3$	7	(1, 7)
2	$y = 4(2) + 3$	11	(2, 11)
3	$y = 4(3) + 3$	15	(3, 15)

EXAMPLE 1 Use a Table of Ordered Pairs

Sample Answer: Four possible solutions are (0, 3), (1, 7), (2, 11), and (3, 15).

CHECK Your Progress

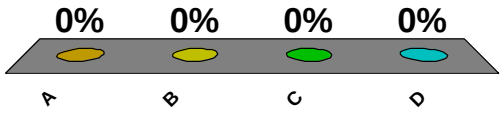
1 Find four solutions of $y = 2x - 4$.

A. (1, –2), (3, 2), (5, 1), and (7, 10)

B. (–2, 0), (0, –4), (2, 0), and (4, 4)

C. (0, –4), (1, –2), (2, 2), and (3, –1)

D. (0, –4), (1, –2), (2, 0), and (3, 2)



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Real-World EXAMPLE Solve an Equation for *y*

2 **BUSINESS** **At a local software company, Level 1 employees *x* earn $48,000 and Level 2 employees *y* earn $24,000. Find four solutions of 48,000*x* + 24,000*y* = 216,000 to determine how many employees at each level the company can hire for $216,000.**

First, rewrite the equation by solving for *y*.

Real-World EXAMPLE Solve an Equation for *y*

2 $48{,}000x + 24{,}000y = 216{,}000$ Write the equation.

$24{,}000y = 216{,}000 - 48{,}000x$ Subtract $48{,}000x$ from each side.

$$\frac{24{,}000y}{24{,}000} = \frac{216{,}000}{24{,}000} - \frac{48{,}000x}{24{,}000}$$ Divide each side by 24,000.

$y = 9 - 2x$ Simplify.

Real-World EXAMPLE Solve an Equation for *y*

2 Choose four *x* values and substitute them into $y = 9 - 2x$.

x	$y = 9 - 2x$	y	(x, y)
0	$y = 9 - 2(0)$	9	(0, 9)
1	$y = 9 - 2(1)$	7	(1, 7)
2	$y = 9 - 2(2)$	5	(2, 5)
3	$y = 9 - 2(3)$	3	(3, 3)

Sample Answer: (0, 9), (1, 7), (2, 5), and (3, 3)

0 Level 1, 9 Level 2

1 Level 1, 7 Level 2

2 Level 1, 5 Level 2

3 Level 1, 3 Level 2

CHECK Your Progress

2 **BOOKS** At a local bookstore, hardbacks are on sale for $6 and paperbacks are on sale for $3. Bob has $42 to spend on books. Find four solutions to determine how many books of each type Bob can buy with his $42.

A. 0 hardbacks, 42 paperbacks
3 hardbacks, 24 paperbacks
5 hardbacks, 12 paperbacks
7 hardbacks, 0 paperbacks

B. 0 hardbacks, 14 paperbacks
1 hardbacks, 12 paperbacks
2 hardbacks, 10 paperbacks
3 hardbacks, 8 paperbacks

C. 0 hardbacks, 42 paperbacks
3 hardbacks, 24 paperbacks
5 hardbacks, 9 paperbacks
7 hardbacks, 7 paperbacks

D. 0 hardbacks, 14 paperbacks
1 hardbacks, 8 paperbacks
2 hardbacks, 2 paperbacks
3 hardbacks, –4 paperbacks

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EXAMPLE Graph a Linear Equation

3 **Graph $y = x - 3$ by plotting ordered pairs.**

First, find ordered pair solutions.

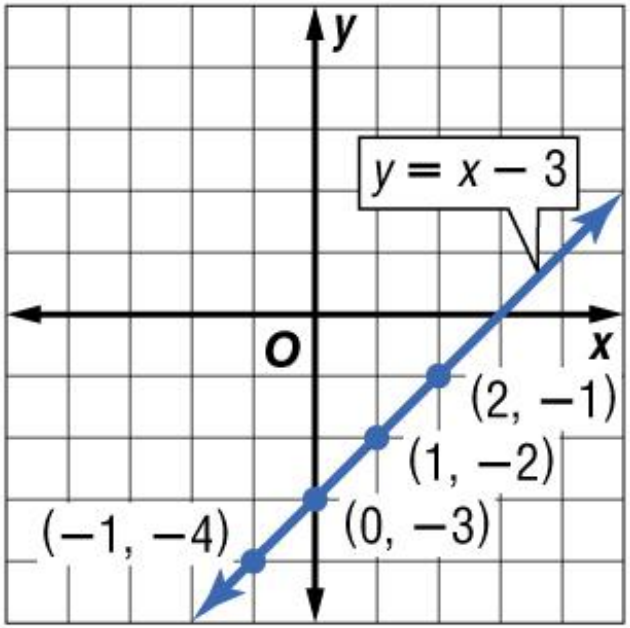
x	$y = x - 3$	y	(x, y)
-1	$y = -1 - 3$	-4	$(-1, -4)$
0	$y = 0 - 3$	-3	$(0, -3)$
1	$y = 1 - 3$	-2	$(1, -2)$
2	$y = 2 - 3$	-1	$(2, -1)$

Four solutions are (–1, –4), (0, –3), (1, –2), and (2, –1).

EXAMPLE Graph a Linear Equation

3 Plot these ordered pairs and draw a line through them. Note that the ordered pair for any point on this line is a solution of $y = x - 3$. The line is a complete graph of the function.

Answer:



EXAMPLE Graph a Linear Equation

3 **Check** It appears from the graph that (4, 1) is also a solution. Check this by substitution.

$y = x - 3$ Write the equation.

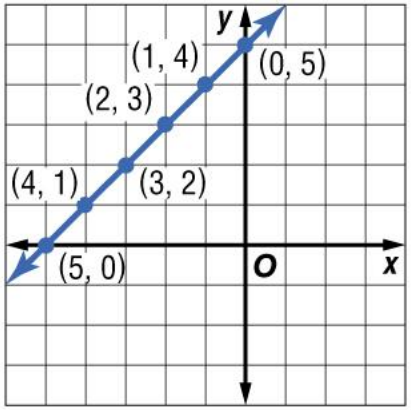
$1 \stackrel{?}{=} 4 - 3$ Replace x with 4 and y with 1.

$1 = 1$ ✓ Simplify.

CHECK Your Progress

3 Graph $y = 5 - x$ by plotting ordered pairs.

A.



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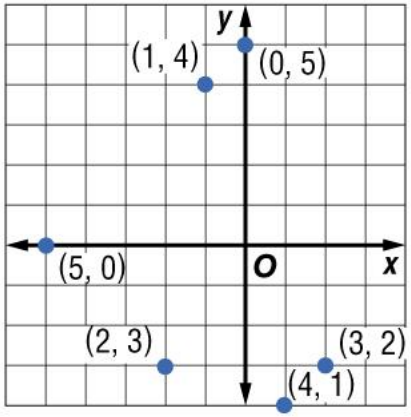
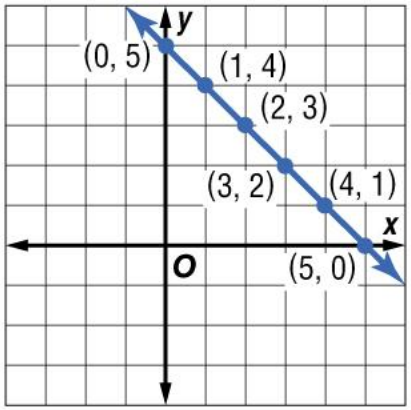
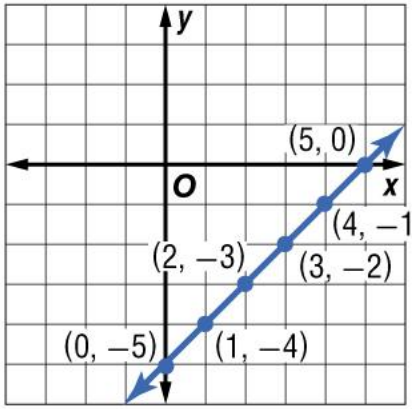


C.



D.



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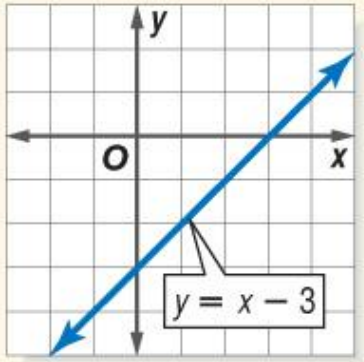
CONCEPT SUMMARY — Representing Functions

Words The value of y is 3 less than the corresponding value of x.

Table of Ordered Pairs

x	y
0	−3
1	−2
2	−1
3	0

Graph



Equation $y = x - 3$

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-2)

Main Ideas and Vocabulary

Example 1: Real-World Example

Example 2: Compare Rates of Change

Example 3: Negative Rate of Change

Concept Summary: Rates of Change

Main Ideas

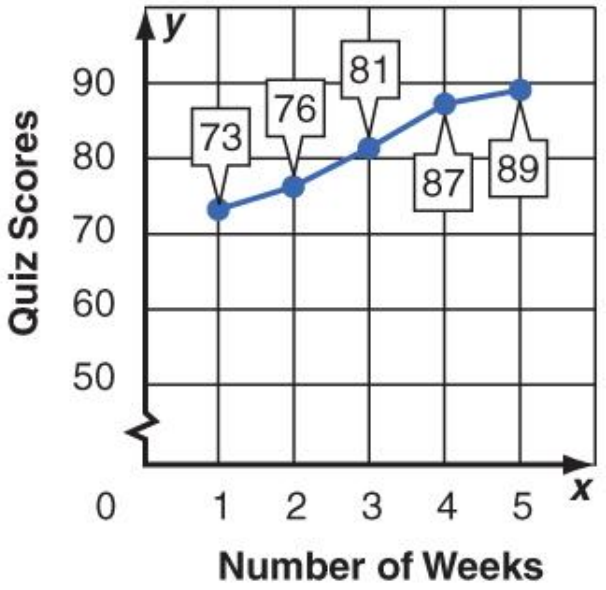
- Find rates of change.
- Solve problems involving rates of change.

New Vocabulary

- rate of change

Real-World EXAMPLE

1 **SCHOOL** **The graph shows Jared's quiz scores for the first five weeks after he joined a study group. Find the rate of change from Week 2 to Week 5.**



$$\text{rate of change} = \frac{89 - 76}{5 - 2}$$

$89 - 76$ ← change in quiz score

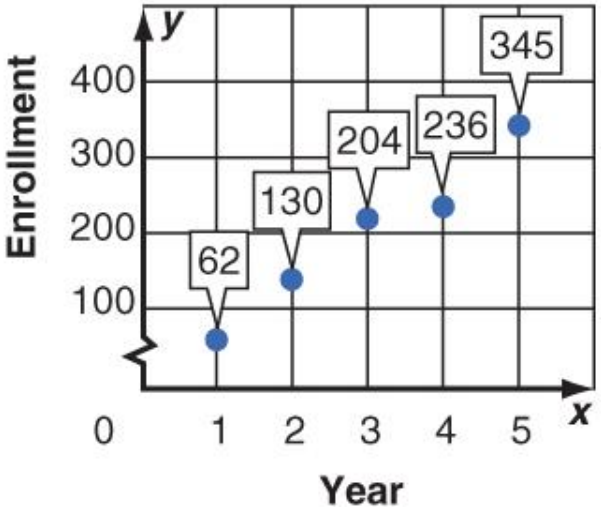
$5 - 2$ ← change in time

≈ 4.3 Simplify.

Answer: The rate of change in quiz scores is an increase of about 4.3 points per week.

CHECK Your Progress

1 **SUMMER CAMP** The graph shows the number of campers enrolled at a summer camp during its first five years of operation. Find the rate of change from Year 2 to Year 5.

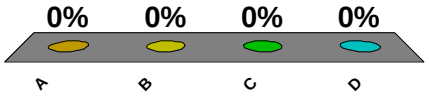


A. 53.8

B. 67.9

C. 70.8

D. 71.7



EXAMPLE Compare Rates of Change

2 **INCOME** The table shows the yearly incomes of two families. Compare the rates of change.

Year	Income ($)	
	Millers	Joneses
2001	49,000	50,000
2002	51,000	52,000
2003	52,500	54,500
2004	55,000	57,000

$$\text{Millers rate of change} = \frac{\text{change in } y}{\text{change in } x}$$

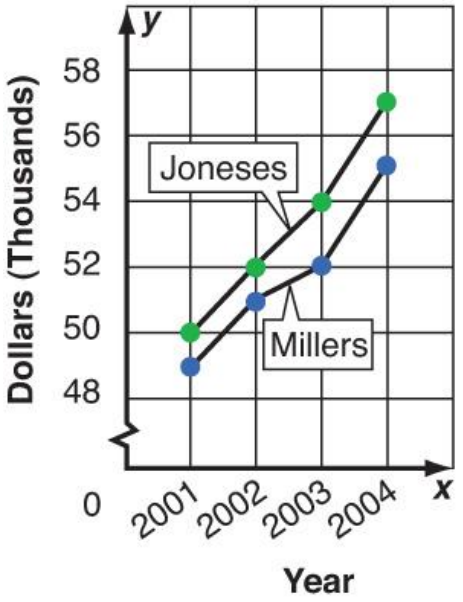
$$= \frac{55{,}000 - 49{,}000}{2004 - 2001} \text{ or } 2000$$

EXAMPLE Compare Rates of Change

2 Joneses rate of change $= \dfrac{\text{change in } y}{\text{change in } x}$

$$= \frac{57{,}000 - 50{,}000}{2004 - 2001} \text{ or } 2333.33$$

Answer: The income of the Joneses increases at a faster rate than the income of the Millers. A steeper line on the graph indicates a greater rate of change for the Joneses.



CHECK Your Progress

2 **INCOME** The table shows the yearly incomes of two families. Compare the rates of change.

Year	Income ($)	
	Browns	Greens
1998	45,000	43,000
1999	48,500	46,000
2000	51,000	49,500
2001	55,000	54,000

A. The Brown's income increases at a faster rate than the Green's income.

B. The Green's income increases at a faster rate than the Brown's income.

C. The Green's income decreases at a faster rate than the Brown's income.

D. The incomes of both families increase at the same rate.

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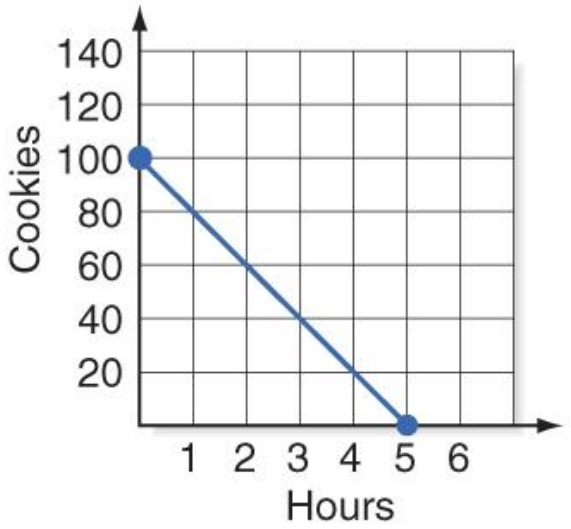
Real-World EXAMPLE Negative Rate of Change

3 **COOKIES** **Natalie sold 100 cookies in 5 hours. The graph shows the relationship between the hours spent selling and the number of cookies that remained. Find the rate of change.**



$$\text{rate of change} = \frac{\text{number of cookies remaining}}{\text{hours spent selling cookies}}$$

$$= \frac{0 - 100}{5 - 0}$$

Real-World EXAMPLE Negative Rate of Change

3

$$= \frac{-100}{5}$$

$$= -20$$

Answer: The rate of change is –20 cookies per hour or a decrease of 20 cookies for each hour selling.

CHECK Your Progress

3 **SCIENCE** In an experiment, Julia allows water to drip from a graduated glass tube. The table shows the volume of water in the tube v after t seconds. Find the rate of change. Interpret its meaning.

Time (s)	Volume (mL)
0	50
5	44
10	38
15	32

A. –1.2; The volume decreases by 1.2 mL each second.

B. –0.83; The volume decreases by 0.83 mL each second.

C. 0.83; The volume increases by 0.83 mL each second.

D. 1.2; The volume increases by 1.2 mL each second.

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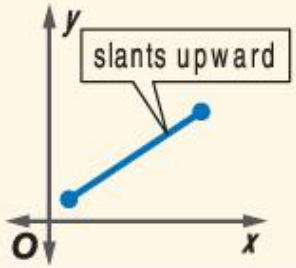
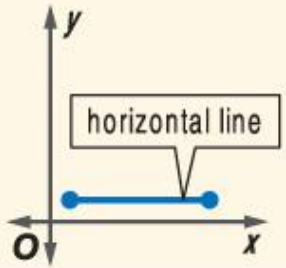
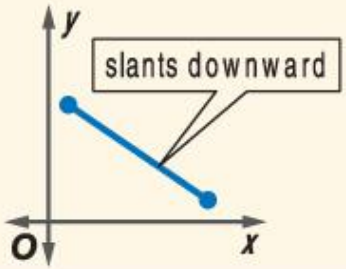
CONCEPT SUMMARY — Rates of Change

Rate of Change	positive	zero	negative
Real-Life Meaning	increase	no change	decrease
Graph			

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-3)

Main Ideas and Vocabulary

Example 1: Use a Graph to Find a Constant Rate of Change

Example 2: Use Graphs to Identify Proportional Linear Relationships

Key Concept: Direct Variation

Example 3: Use Direct Variation to Solve Problems

Concept Summary: Proportional Linear Relationships

Main Ideas

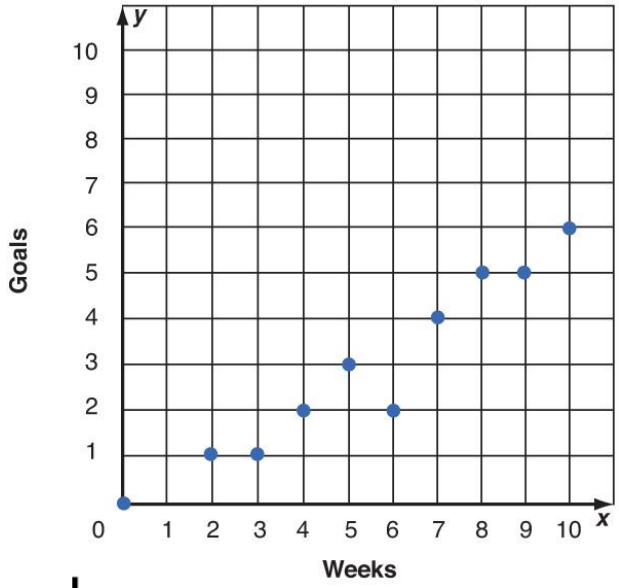
- Identify proportional and nonproportional relationships by finding a constant rate of change.
- Solve problems involving direct variation.

New Vocabulary

- linear relationship
- constant rate of change
- direct variation
- constant of variation

EXAMPLE Use a Graph to Find a Constant Rate of Change

1 **SOCCER** The graph shows Yen's soccer goals for the ten-week season. Find the constant rate of change from Week 2 to Week 8. Describe what the rate means.



$$\text{rate of change} = \frac{\text{change in soccer goals}}{\text{change in time}}$$

$$= \frac{5-1}{8-2}$$

From week 2 to week 8, the number of goals changes from 1 to 5.

EXAMPLE Use a Graph to Find a Constant Rate of Change

1

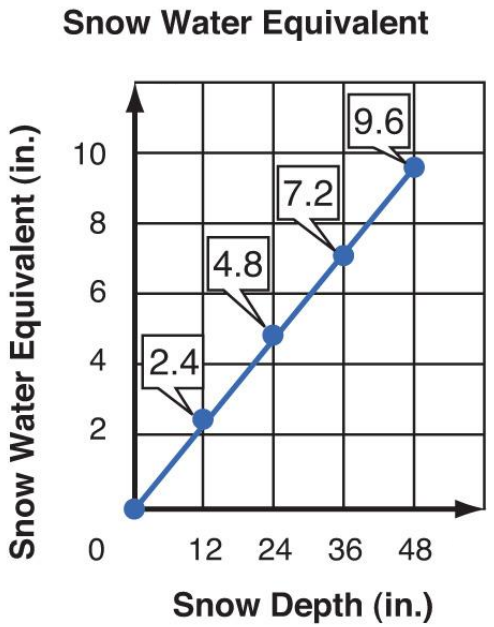
$= \frac{4}{6}$ Simplify.

$= \frac{2}{3}$

Answer: $\frac{2}{3}$; For every 3 week interval, Yen increases his score by 2 goals.

CHECK Your Progress

1 **WEATHER** The snow water equivalent (SWE) is a common measure of the amount of water contained within a snowpack. It can be thought of as the depth of water that would result if you melted the entire snowpack. Find the constant rate of change for the snow water equivalent in the graph shown. Describe what the rate means.

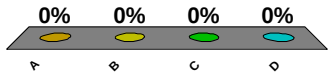


A. 0.2; The snow water equivalent is 0.2 times the snow depth.

B. 1.2; The snow water equivalent is 1.2 times the snow depth.

C. 2.4; The snow water equivalent is 2.4 times the snow depth.

D. 5; The snow water equivalent is 5 times the snow depth.



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EXAMPLE Use Graphs to Identify Proportional Relationships

2 **JOGGING** The distance that a jogger runs is recorded in the table. Determine if there is a proportional linear relationship between the time and distance.

Time (min)	Distance (mi)
x	y
15	12
30	22
45	30
60	34

Determine if the ratio of each y-value (distance) compared to the corresponding x-value (time) is the same.

EXAMPLE Use Graphs to Identify Proportional Relationships

2 $\dfrac{\text{Distance } y}{\text{time } x} \rightarrow \dfrac{12}{15} \quad \dfrac{22}{30} = \dfrac{11}{15} \quad \dfrac{30}{45} = \dfrac{2}{3} \quad \dfrac{34}{60} = \dfrac{17}{30}$

Answer: No, the ratio $\dfrac{\text{distance}}{\text{time}}$ is not the same for every pair of values.

CHECK Your Progress

2 **SHIPPING** The charge for shipping CDs from an online store is based on the number of CDs in the package. Determine if there is a proportional linear relationship between the shipping charge and the number of CDs.

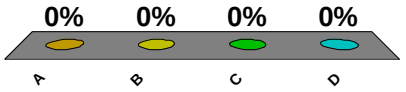
CDs	Shipping ($)
1	1.99
2	2.98
3	3.97
4	4.96

A. Yes, since the number of CDs is proportional to the shipping charge.

B. Yes, since the charge for each additional CD is $0.99.

C. No, since the shipping charge is not proportional to the number of CDs.

D. No, since the shipping charge is not equal to the number of CDs.



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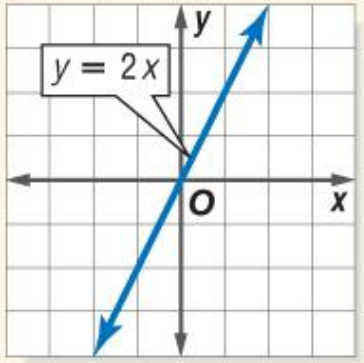
KEY CONCEPT — Direct Variation

Words A direct variation is a relationship in which the ratio of y to x is a constant, k. We say y varies directly with x.

Symbols $y = kx$, where $k \neq 0$

Example $y = 2x$

Model



Real-World EXAMPLE Use Direct Variation to Solve Problems

3 **A. LANDSCAPING** As it is being dug, the depth of a wide hole for a backyard pond is recorded on a table. Write an equation that relates time and hole depth.

Time (min)	Hole Depth (in.)
x	y
10	8
20	15
30	24
40	32

Step 1 Find the value of k using the equation $y = kx$. Choose any point in the table. Then solve for k.

$y = kx$ Direct variation

$8 = k(10)$ Replace y with 8 and x with 10.

Real-World EXAMPLE Use Direct Variation to Solve Problems

3

$\frac{8}{10} = k$ Divide each side by 10.

$0.8 = k$ Simplify.

Step 2 Use k to write an equation.

$y = kx$ Direct variation

$y = 0.8x$ Replace k with 0.8.

Answer: $y = 0.8x$

Real-World EXAMPLE

Use Direct Variation to Solve Problems

3 **B. Predict how long it will take to dig a depth of 36 inches.**

$y = 0.8x$	Write the direct variation equation.
$36 = 0.8x$	Replace y with 36.
$\frac{36}{0.8} = x$	Divide each side by 0.8.
$45 = x$	Simplify.

Answer: 45 minutes

CHECK Your Progress

3 **BUSINESS** The graph shows the number of frequent customer points a book store customer receives for each dollar spent in the store. Write an equation that relates the spending s and the points p. Then predict how many points a customer receives for a purchase of $34.40.

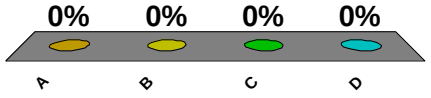
Spending ($)	Points
10.60	53
15.80	79
22.20	111
28.60	143

A. $p = 5s$; 172

B. $p = 5s$; 220

C. $s = 5p$; 172

D. $s = 5p$; 220

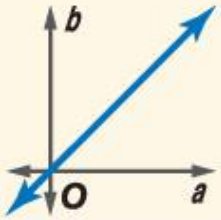


CheckPoint

CONCEPT SUMMARY — Proportional Linear Relationships

Words Two quantities a and b have a proportional linear relationship if they have a constant ratio and a constant rate of change.

Graph



Symbols $\frac{a}{b}$ is constant and $\frac{\text{change in } b}{\text{change in } a}$ is constant.

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-4)

Main Idea and Vocabulary

Example 1: Use Rise and Run to Find Slope

Example 2: Use a Graph to Find Slope

Key Concept: Slope

Example 3: Positive and Negative Slopes

Example 4: Zero and Undefined Slopes

Example 5: Standardized Test Example: Compare Slopes

Main Idea

- Find the slope of a line.

New Vocabulary

- slope

Real-World EXAMPLE Use Rise and Run to Find Slope

1 **HILLS** Find the slope of a hill that rises 30 feet for every horizontal change of 150 feet.

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$ Write the formula.

$$= \frac{30 \text{ feet}}{150 \text{ feet}}$$ rise = 30 feet, run = 150 feet

$$= \frac{1}{5}$$ Simplify.

Answer: The slope of the hill is $\frac{1}{5}$ or 0.2.

CHECK Your Progress

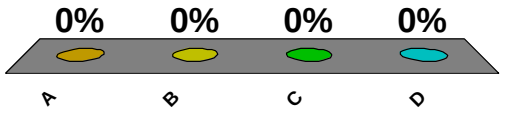
1 Find the slope of a hill that rises 40 feet for every horizontal change of 100 feet.

A. $\frac{5}{2}$

B. $\frac{2}{5}$

C. $\frac{2}{3}$

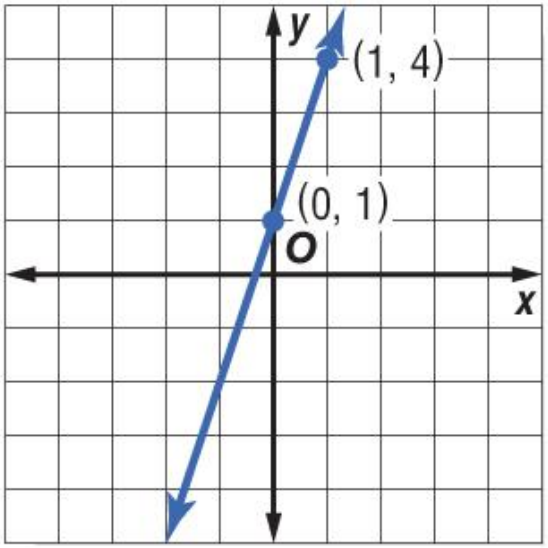
D. $\frac{3}{5}$



CheckPoint

EXAMPLE Use a Graph to Find Slope

2 **A. Find the slope of the line.**



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

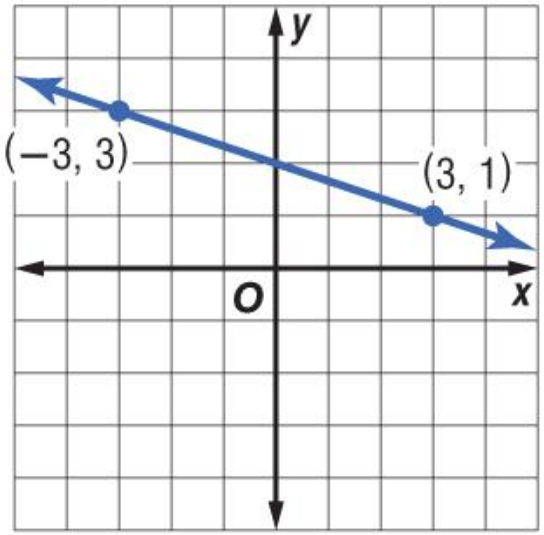
$$m = \frac{4 - 1}{1 - 0}$$ $(x_1, y_1) = (0, 1)$, $(x_2, y_2) = (1, 4)$

$$m = \frac{3}{1} \text{ or } 1$$

Answer: The slope is 3.

EXAMPLE 2 Use a Graph to Find Slope

B. Find the slope of the line.



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

$$m = \frac{3 - 1}{-3 - 3}$$ $(x_1, y_1) = (3, 1)$

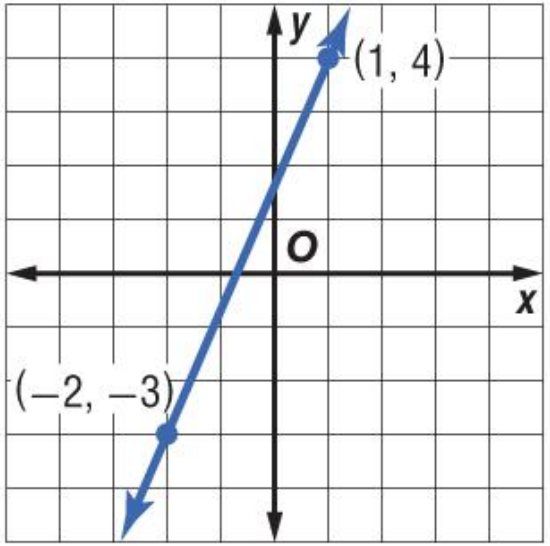
$(x_2, y_2) = (-3, 3)$

$$m = \frac{2}{-6} \text{ or } -\frac{1}{3}$$

Answer : The slope is $-\frac{1}{3}$.

CHECK Your Progress

2 **A. Find the slope of the line.**



A. $\frac{7}{3}$

B. $-\frac{7}{3}$

C. $\frac{3}{7}$

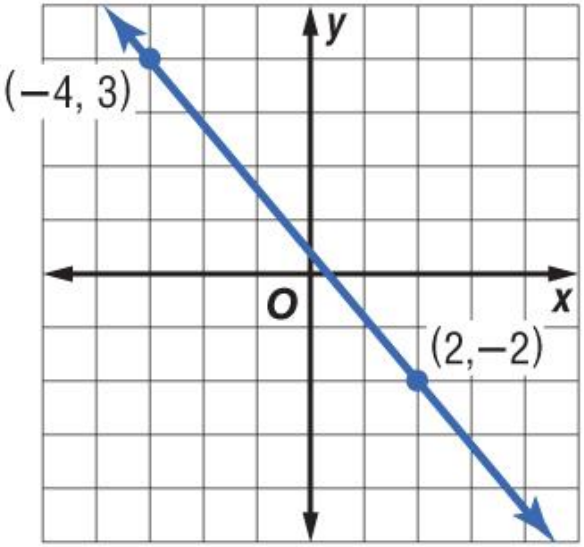
D. $-\frac{3}{7}$

0%

A B C D

CHECK Your Progress

2 B. Find the slope of the line.



A. $\frac{1}{2}$

B. $-\frac{1}{2}$

C. $-\frac{5}{6}$

D. $-\frac{6}{5}$

0%

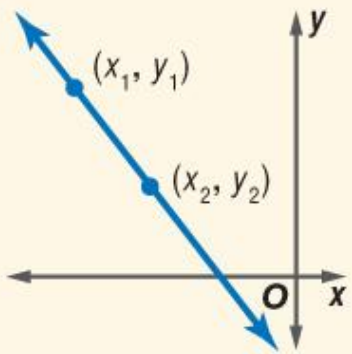
A B C D

KEY CONCEPT Slope

Words The slope m of a line passing through points at (x_1, y_1) and (x_2, y_2) is the ratio of the difference in y-coordinates to the corresponding difference in x-coordinates.

Symbols $m = \frac{y_2 - y_1}{x_2 - x_1}$, where $x_2 \neq x_1$

Model



EXAMPLE Positive and Negative Slopes

3 **A. Find the slope of the line that passes through the following pair of points. *B*(2, 7), *C*(–3, –2)**

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

$$m = \frac{-2 - 7}{-3 - 2}$$ $(x_1, y_1) = (2, 7)$

$(x_2, y_2) = (-3, 2)$

$$m = \frac{-9}{-5} \text{ or } \frac{9}{5}$$

Answer: The slope is $\frac{9}{5}$.

EXAMPLE Positive and Negative Slopes

3 B. Find the slope of the line that passes through the following pair of points. *F*(–5, 1), *G*(–3, –6)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

$$m = \frac{-6 - 1}{-3 - (-5)}$$ $(x_1, y_1) = (-5, 1)$

$(x_2, y_2) = (-3, -6)$

$$m = \frac{-7}{2}$$

Answer: The slope is $-\frac{7}{2}$.

CHECK Your Progress

3 **A. Find the slope of the line that passes through the following pair of points. *A*(–2, 4), *B*(5, –1)**

A. $\frac{5}{7}$

B. $-\frac{5}{7}$

C. 1

D. $-\frac{3}{7}$

0%

A B C D

CheckPoint

CHECK Your Progress

3 **B. Find the slope of the line that passes through the following pair of points. $M(-3, -4)$, $N(4, 2)$**

A. $\frac{6}{7}$

B. $\frac{7}{6}$

C. -2

D. -6

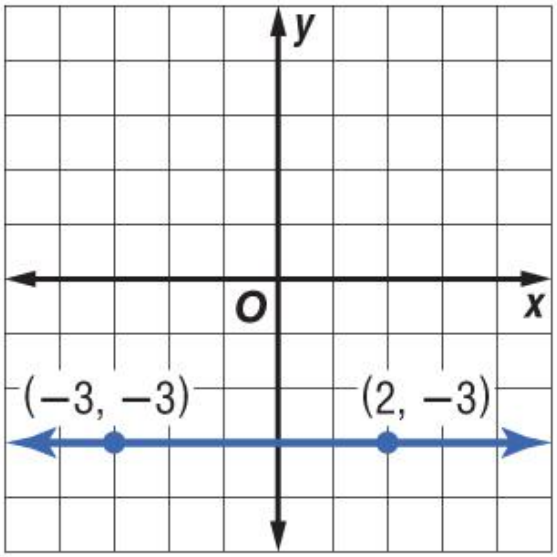
0%

A B C D

CheckPoint

EXAMPLE Zero and Undefined Slopes

4 A. Find the slope of the line.



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

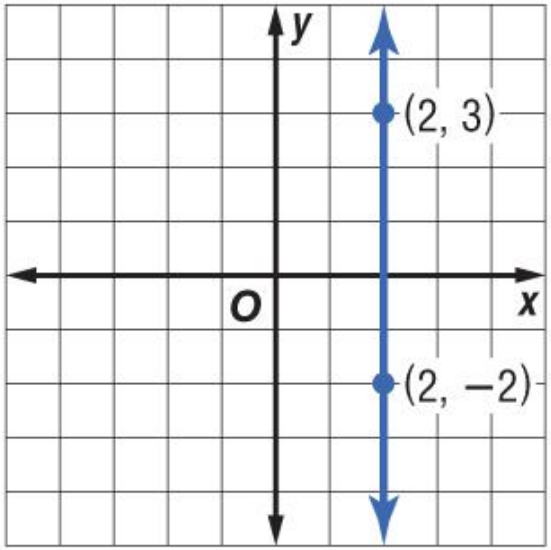
$$m = \frac{-3 - (-3)}{2 - (-3)}$$ $(x_1, y_1) = (-3, -3)$, $(x_2, y_2) = (2, -3)$

$$m = \frac{0}{5} \text{ or } 0$$

Answer: The slope is 0.

EXAMPLE Zero and Undefined Slopes

4 B. Find the slope of the line.



$(x_1, y_1) = (2, -2)$

$(x_2, y_2) = (2, 3)$

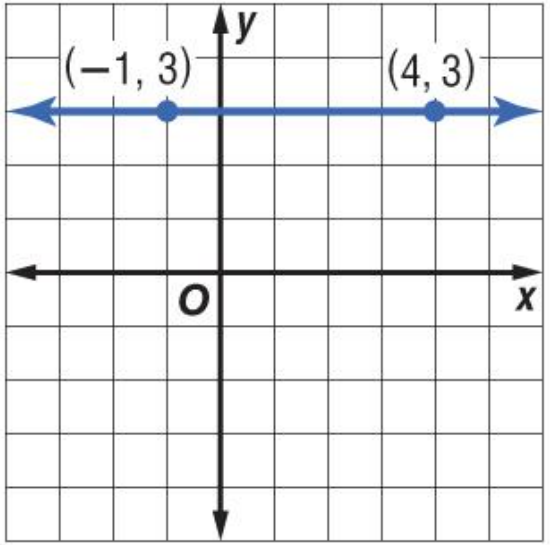
$$m = \frac{5}{0}$$

Division by 0 is undefined. So, the slope is undefined.

Answer: The slope is undefined.

CHECK Your Progress

4 **A. Find the slope of the line.**

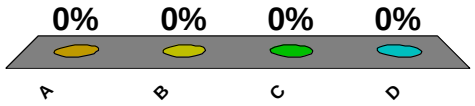


A. 2

B. 0

C. $\frac{1}{2}$

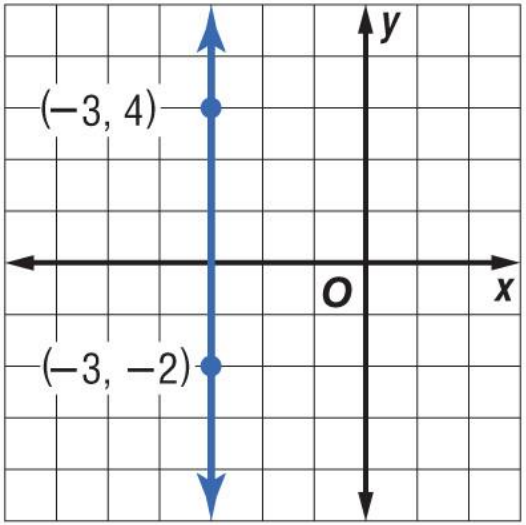
D. undefined



CheckPoint

CHECK Your Progress

4 **B. Find the slope of the line.**

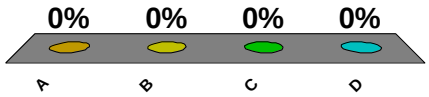


A. 0

B. $-\frac{1}{3}$

C. –1

D. undefined



Standardized Test EXAMPLE

Compare Slopes

5 **Two highway routes connect City A and City B. The first route rises 4 yards vertically for every 30-mile stretch. The second route rises 8 yards vertically for every 70-mile stretch. Which statement is true?**

A The first route is steeper than the second route.

B The second route is steeper than the first route.

C Both routes have the same steepness.

D You cannot determine which route is steeper.

Read the Test Item

To compare the steepness of the routes, find the slopes.

Standardized Test EXAMPLE

Compare Slopes

5 Solve the Test item

first route

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

$$= \frac{4 \text{ yards}}{30 \text{ miles}}$$

$$= \frac{4 \text{ yards}}{52{,}800 \text{ yards}}$$

30 miles = 52,800 yards

or about 0.000076

second route

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

$$= \frac{8 \text{ yards}}{70 \text{ miles}}$$

$$= \frac{8 \text{ yards}}{123{,}200 \text{ yards}}$$

or about 0.000065

Standardized Test EXAMPLE

Compare Slopes

5 0.000076 > 0.000065, so the first route is steeper than the second route.

Answer: The answer is A.

CHECK Your Progress

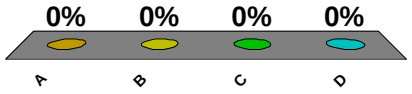
5 **MULTIPLE-CHOICE TEST ITEM** There are two hiking trails that connect a nature center to a waterfall. The first trail rises vertically 3 feet for every 40-foot stretch. The second trail rises vertically 5 feet for every 30-foot stretch. Which statement is true?

A. The first trail is steeper than the second trail.

B. The second trail is steeper than the first trail.

C. Both trails have the same steepness.

D. You cannot determine which trail is steeper.



CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-5)

Main Ideas and Vocabulary

Example 1: Find the Slope and *y*-Intercept

Example 2: Write an Equation in Slope-Intercept Form

Example 3: Graph an Equation

Example 4: Real-World Example

Main Ideas

- Determine slopes and *y*-intercepts of lines.
- Graph linear equations using the slope and *y*-intercept.

New Vocabulary

- *y*-intercept
- slope-intercept form

EXAMPLE Find the Slope and *y*-Intercept

1 **State the slope and the *y*-intercept of the graph of $y = \frac{1}{2}x + 3$.**

$y = \frac{1}{2}x + 3$ Write the original equation.

$y = mx + b$

$m = \frac{1}{2}$, $b = 3$

Answer: The slope of the graph is $\frac{1}{2}$, and the *y*-intercept is 3.

CHECK Your Progress

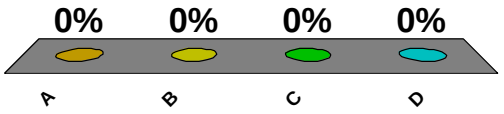
1 State the slope and the *y*-intercept of the graph of $y = 2x - 7$.

A. $m = 2; b = -7$

B. $m = 2; b = 7$

C. $m = 7; b = 2$

D. $m = -7; b = 2$



CheckPoint

EXAMPLE Write an Equation in Slope-Intercept Form

2 **State the slope and the *y*-intercept of the graph of $-4x + 5y = -10$.**

$-4x + 5y = -10$ Write the original equation.

$-4x + 5y + 4x = -10 + 4x$ Add $4x$ to each side.

$5y = -10 + 4x$ Simplify.

$y = -2 + \frac{4}{5}x$ Divide each side by 5.

EXAMPLE Write an Equation in Slope-Intercept Form

2

$$y = \frac{4}{5}x + (-2)$$

$$y = mx + b$$

Write the equation in slope-intercept form.

$$m = \frac{4}{5},\ b = -2$$

Answer: The slope of the graph is $\frac{4}{5}$, and the *y*-intercept is –2.

Concepts in MOtion

BrainPOP:
Slope and Intercept

Click here to view!

CHECK Your Progress

2 State the slope and the *y*-intercept of the graph of $-5x + y = 1$.

A. $m = -5$; $b = 1$

B. $m = 5$; $b = 1$

C. $m = 1$; $b = 5$

D. $m = 1$; $b = -5$

0%

A B C D

CheckPoint

EXAMPLE Graph an Equation

3 **Graph $y = -3x + 9$ using the slope and y-intercept.**

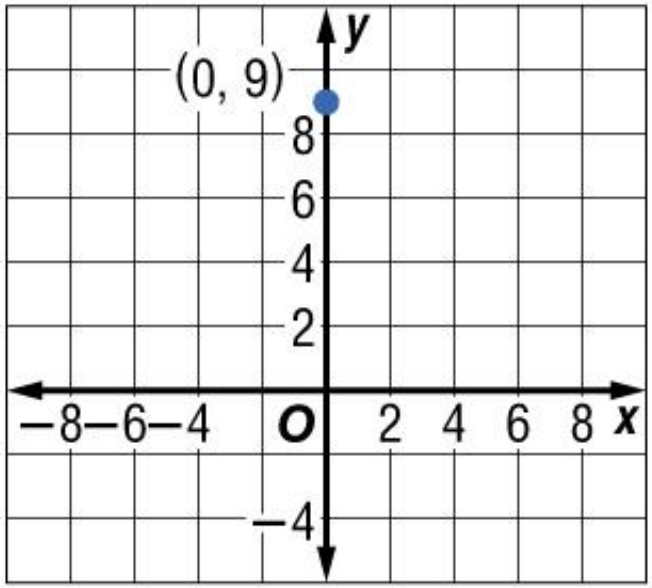
Step 1 Find the slope and y-intercept.

slope $= -3$ y-intercept $= 9$

EXAMPLE Graph an Equation

Step 2 Graph the *y*-intercept point at (0, 9)

Step 3 Write the slope -3 as $\frac{-3}{1}$. Use it to locate a second point on the line.

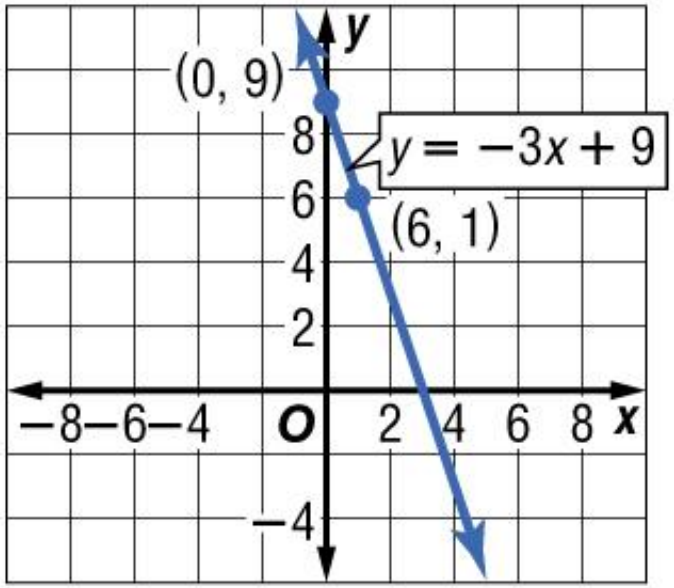


$$m = \frac{-3}{1} \qquad \frac{\text{change in } y:\ \text{down 3 units}}{\text{change in } x:\ \text{right 1 unit}}$$

EXAMPLE Graph an Equation

3 Another point on the line is at (1, 6).

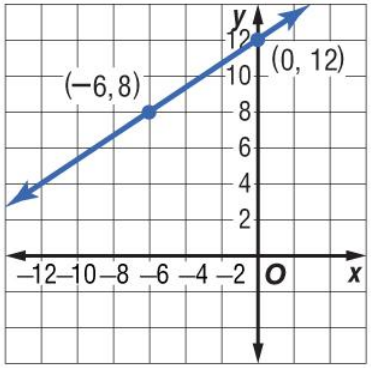
Step 4 Draw a line through the two points.



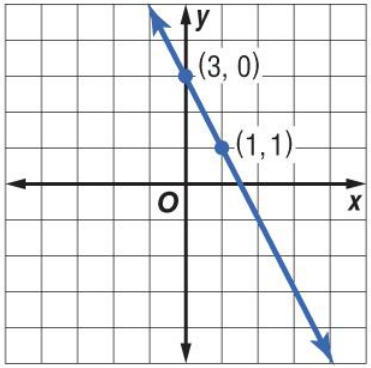
CHECK Your Progress

3 Graph $-2x + 3y = 12$ using the slope and y-intercept.

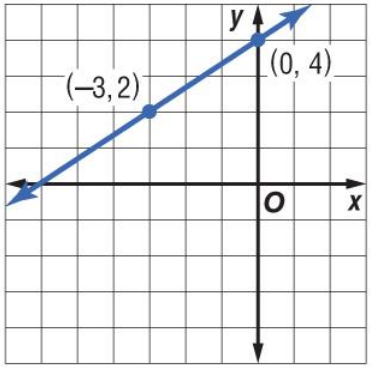
A.



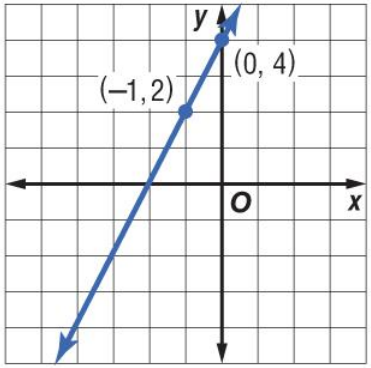
B.



C.



D.



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A B C D

CheckPoint

Real-World EXAMPLE

4 **A. BAKING** **A school group making cookies for a bake sale spends $75 on ingredients and then sells the cookies for $5 a dozen. The amount earned *y* can be represented by the equation $y = 5x - 75$, where *x* equals the number of dozens sold.**

Graph the equation.

First, find the slope and the *y*-intercept.

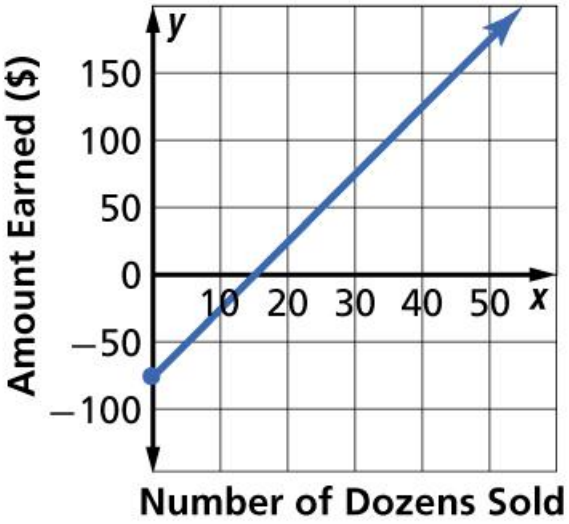
slope = 5

y-intercept = –75

Real-World EXAMPLE

4 Plot the point at (0, –75). Then go up 5 and right 1. Connect these points.

Answer:



Real-World EXAMPLE

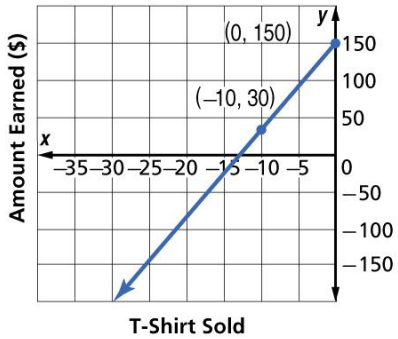
4 **B. Describe what the *y*-intercept and the slope represent.**

Answer: The *y*-intercept –75 represents the cost of the ingredients. Slope 5 represents the dollars earned per dozen cookies.

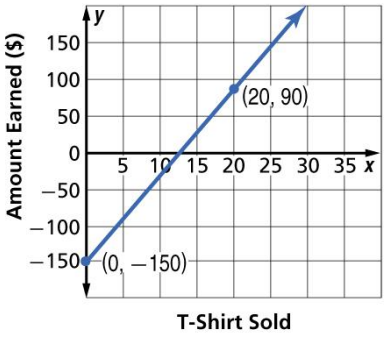
CHECK Your Progress

4 **A. T-SHIRTS** A T-shirt company spends $150 on materials to make T-shirts and then sells the shirts for $12 each. The amount earned y can be represented by the equation $y = 12x - 150$, where x represents the number of shirts sold. Graph the equation.

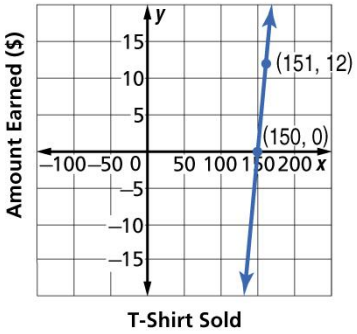
A.



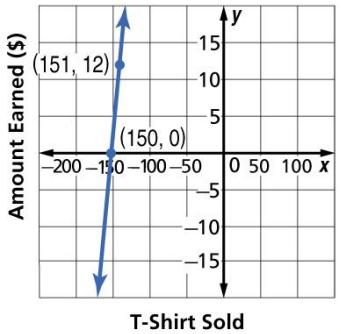
B.

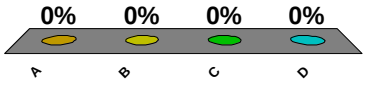


C.



D.





CheckPoint

CHECK Your Progress

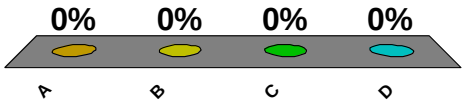
4 **B. Describe what the *y*-intercept and the slope represent.**

A. ***y*-intercept 150 represents number of shirts sold; slope 12 represents cost of materials.**

B. ***y*-intercept –150 represents cost of materials; slope 12 represents dollars earned per shirt.**

C. ***y*-intercept 150 represents dollars earned; slope 12 represents cost per shirt.**

D. ***y*-intercept –150 represents cost of materials; slope 12 represents number of shirts sold.**



CheckPoint

End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-6)

Main Idea

Example 1: Write Equations From Slope and *y*-Intercept

Example 2: Write an Equation From a Graph

Example 3: Write an Equation to Make a Prediction

Example 4: Write an Equation Given Two Points

Example 5: Write an Equation From a Table

Main Idea

- Write equations given the slope and *y*-intercept, a graph, a table, or two points.

EXAMPLE 1 Write Equations From Slope and *y*-Intercept

A. Write an equation in slope-intercept form for the line.

$\text{slope} = -\frac{1}{4}$, y-intercept $= 7$

$y = mx + b$ Slope-intercept form

Answer: $y = -\frac{1}{4}x + 7$ Replace m with $-\frac{1}{4}$ and b with 7.

EXAMPLE 1 Write Equations From Slope and *y*-Intercept

B. Write an equation in slope-intercept form for the line.

slope = 2, *y*-intercept = 0

	$y = mx+b$	Slope-intercept form
	$y = 2x + (0)$	Replace m with 2 and b with 0.
Answer:	$y = 2x$	Simplify.

CHECK Your Progress

1 **A. Write an equation in slope-intercept form for the line.**

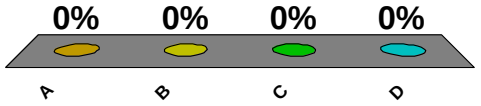
slope = –3, *y*-intercept = –5

A. $y = -3x + 5$

B. $3x + y = -5$

C. $y = -5x - 3$

D. $y = -3x - 5$



CheckPoint

CHECK Your Progress

1 **B. Write an equation in slope-intercept form for the line.**

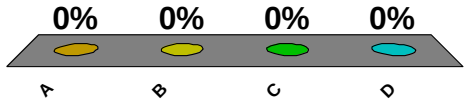
slope = 0, *y*-intercept = 9

A. $y = x + 9$

B. $y = 9$

C. $y = -9$

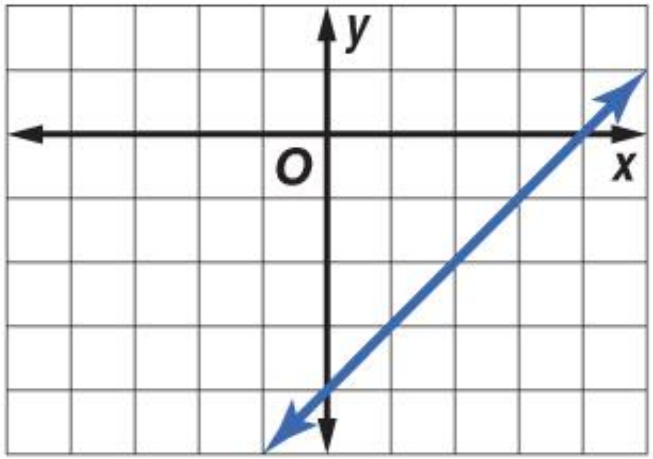
D. $y = 9x$



CheckPoint

EXAMPLE Write an Equation From a Graph

2 **Write an equation in slope-intercept form for the line graphed.**



The *y*-intercept is –4. From (0, –4), you can go up one unit and to the right one unit to another point on the line. So, the slope is 1.

EXAMPLE Write an Equation From a Graph

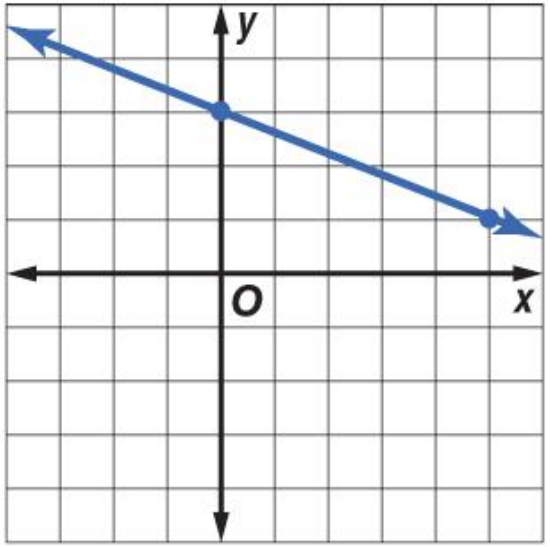
2

$y = mx + b$	Slope-intercept form
$y = 1x + (-4)$	Replace m with 1 and b with –4.

Answer: $y = x - 4$ Simplify.

CHECK Your Progress

2 Write an equation in slope-intercept form for the line graphed.



A. $y = -\frac{2}{5}x + 3$

B. $y = \frac{2}{5}x + 3$

C. $\frac{2}{5}x + y = 3$

D. $y = 3x - \frac{2}{5}$

0%

A B C D

EXAMPLE 3 Write an Equation to Make a Prediction

BUSINESS **The owners of the Good Times Eatery surveyed their customers to find out where they lived. They learned that for each 5-mile radius from their restaurant, 30 fewer people visited them. They had 150 patrons in the area immediately surrounding the diner. Predict the number of customers who lived 20 miles away.**

Explore

You know the rate of change of number of customers to each 5-mile radius (slope) and the number of customers in the area immediately surrounding the diner (*y*-intercept). Make a table of ordered pairs.

Distance, (mi), *x*	Number of Patrons, *y*
0	150
5	120
10	90
15	60

EXAMPLE 3 Write an Equation to Make a Prediction

Plan

Write an equation to show the relationship between the distance x and the number of customers y. Then, substitute the distance of 20 miles into the equation to find the number of customers.

Solve

Step 1 Find the slope m.

$$m = \frac{\text{change in } y}{\text{change in } x}$$

$\leftarrow$ decrease of 30 customers

$\leftarrow$ increase of 5 miles

$$= \frac{-30}{5}$$

$$= -6$$

Simplify.

EXAMPLE Write an Equation to Make a Prediction

3 Step 2 Find the y-intercept b.

(x, y) = (distance, customers)

$= (0, b)$

When the distance is 0 miles, the number of customers is 150. So, the y-intercept is 150.

Step 3 Write the equation.

$y = mx + b$ Slope-intercept form

$y = -6x + 150$ Replace m with -6 and b with 150.

EXAMPLE Write an Equation to Make a Prediction

Step 4 Substitute the distance of 20 miles.

$y = -6x + 150$ Write the equation.

$y = -6(20) + 150$ Replace x with 20.

$y = 30$ Simplify.

Answer: At a distance of 20 miles, the number of customers is 30.

CHECK Your Progress

3 **WEATHER** Attendance at an outdoor sporting event is affected by the temperature outside. When the outside temperature is 0°F, the attendance is 12 people. For every increase in temperature of 20 degrees, the attendance increases by 100 people. Predict the attendance if the temperature is 60°F.

A. 112

0%

B. 300

C. 312

D. 412

A B C D

CheckPoint

EXAMPLE Write an Equation Given Two Points

4 **Write an equation for the line that passes through (7, 0) and (6, 3).**

Step 1 Find the slope m.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

$$= \frac{3 - 0}{6 - 7}$$ $(x_1, y_1) = (7, 0)$, $(x_2, y_2) = (6, 3)$

$$= \frac{3}{-1} \text{ or } -3$$

EXAMPLE Write an Equation Given Two Points

Step 2 Find the y-intercept b. Use the slope and the coordinates of either point.

$y = mx + b$	Slope-intercept form
$0 = -3(7) + b$	Replace (x, y) with $(7, 0)$ and m with -3.
$21 = b$	Simplify.

EXAMPLE Write an Equation Given Two Points

Step 3 Substitute the slope and *y*-intercept.

$y = mx + b$ Slope-intercept form

$y = -3x + 21$ Replace m with –3 and b with 21.

Answer: $y = -3x + 21$

CHECK Your Progress

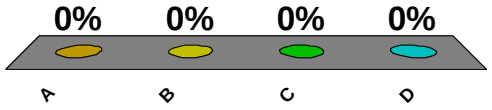
4 **Write an equation for the line that passes through (4, –2) and (–2, –14).**

A. $y = -8x + 30$

B. $y = \frac{8}{3}x - \frac{38}{2}$

C. $y = 2x + 6$

D. $y = 2x - 10$



CheckPoint

EXAMPLE Write an Equation From a Table

5 **Use the table of values to write an equation in slope-intercept form.**

x	y
–2	16
–1	10
0	4
1	–2

Step 1 Find the slope m. Use the coordinates of any two points.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Definition of slope

$$= \frac{10 - 16}{-1 - (-2)}$$ $(x_1, y_1) = (-2, 16)$

$(x_2, y_2) = (-1, 10)$

$$= \frac{-6}{1} \text{ or } -6$$

EXAMPLE Write an Equation From a Table

5 **Step 2** Find the *y*-intercept *b*. Use the slope and the coordinates of either point.

$y = mx + b$	Slope-intercept form
$16 = -6(-2) + b$	Replace (x, y) with $(-2, 16)$ and m with -6.
$4 = b$	Simplify.

Step 3 Substitute the slope and *y*-intercept.

$y = mx + b$	Slope-intercept form
$y = -6x + 4$	Replace m with -6 and b with 4.

Answer: $y = -6x + 4$

CHECK Your Progress

5 Use the table of values to write an equation in slope-intercept form.

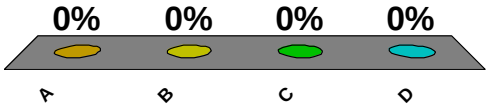
x	y
−6	4
−3	2
3	−2
6	−4

A. $y = -\frac{2}{3}x$

B. $y = -\frac{2}{3}x - 4$

C. $y = -\frac{2}{9}x + \frac{4}{3}$

D. $y = -\frac{2}{9}x + \frac{8}{3}$



End of the Lesson

Click the mouse button to return to the Chapter Menu.

Lesson Menu

Five-Minute Check (over Lesson 7-7)

Main Ideas and Vocabulary

Example 1: Make Predictions from a Line of Fit

Example 2: Make Predictions from an Equation

Main Ideas

- Draw lines of fit for sets of data.
- Use lines of fit to make predictions about data.

New Vocabulary

- line of fit

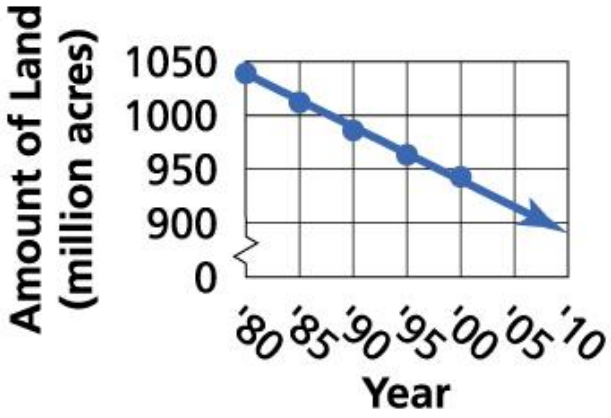
EXAMPLE Make Predictions from a Line of Fit

1 **A. AGRICULTURE** The table shows the amount of land in U.S. Farms from 1980 to 2000.

Make a scatter plot and draw a line of fit for the data.

Year	Land (million acres)
1980	1039
1985	1012
1990	986
1995	963
2000	943

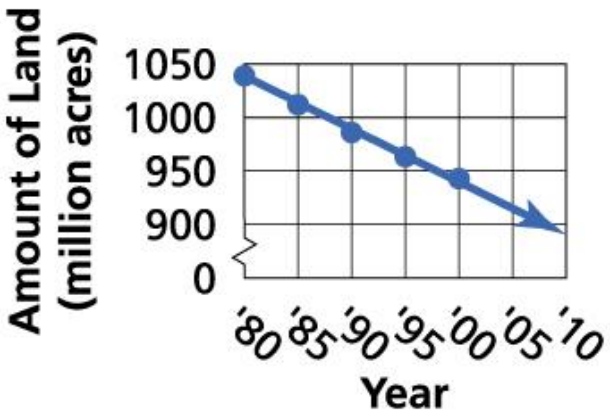
Answer:



EXAMPLE Make Predictions from a Line of Fit

B. Use the line of fit to predict the amount of land in the year 2010.

Extend the line so that you can find the *y* value for an *x* value of 2010. The *y* value for 2010 is about 892. So, a prediction for the amount of farm land in 2010 is approximately 892 million acres.



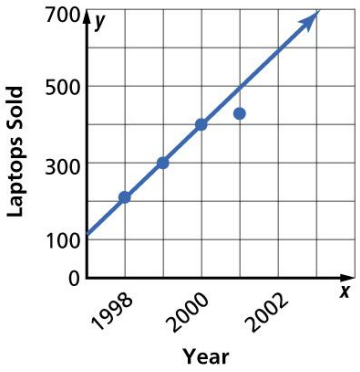
Answer: about 892 million acres

CHECK Your Progress

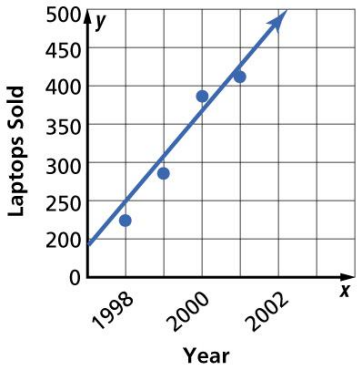
1 **A. RETAIL** The table shows the number of laptop computers sold at a local computer store from 1998 to 2001. Make a scatter plot and draw a line of fit for the data.

Year	Number of Laptops Sold
1998	215
1999	298
2000	395
2001	430

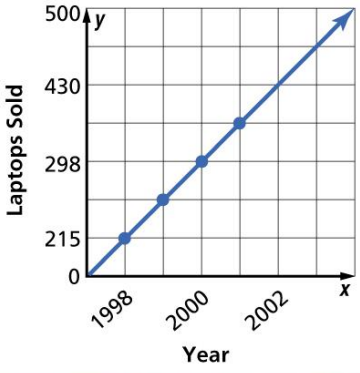
A.



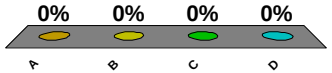
B.



C.



D. A line of fit can not be drawn since the data points are not in a straight line.



CheckPoint

CHECK Your Progress

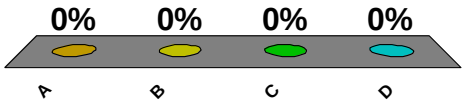
1 **B. Use the line of fit to predict the number of laptops sold in the year 2003.**

A. about 600

B. about 650

C. about 700

D. cannot be determined from given information



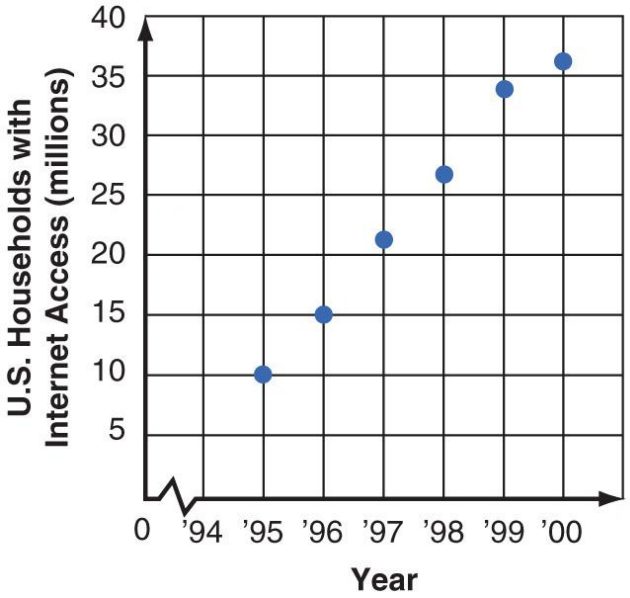
CheckPoint

EXAMPLE 2 Make Predictions from an Equation

A. INTERNET The scatter plot shows the number of U.S. households (millions) with internet access. Write an equation in slope-intercept form for the line of fit.

Step 1

First, select two points on the line and find the slope. Notice that the two points chosen are not original data points. We have chosen (1995, 10) and (1999, 34).



EXAMPLE Make Predictions from an Equation

2 $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ Definition of slope

$m = \dfrac{34 - 10}{1999 - 1995}$ $(x_1, y_1) = (1995, 10)$, $(x_2, y_2) = (1999, 34)$

$m = \dfrac{24}{4}$ or 6 Simplify.

Step 2 Next, find the *y*-intercept.

$y = mx + b$ Slope-intercept form

$10 = 6(1995) + b$ Replace (x, y) with $(1995, 10)$ and m with 6.

$-11{,}960 = b$ Simplify.

EXAMPLE Make Predictions from an Equation

Step 3 Write the equation.

$y = mx + b$ Slope-intercept form

$y = 6x + (–11{,}960)$ Replace m with 6 and b with –11,960.

Answer: $y = 6x – 11{,}960$

EXAMPLE 2 Make Predictions from an Equation

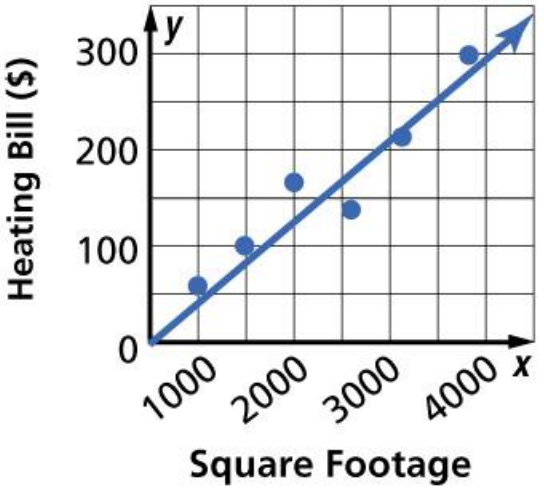
B. Predict the number of U.S. households that will have internet in the year 2010.

$y = 6x - 11{,}960$	Write the equation of the line of fit.
$y = 6(2010) - 11{,}960$	Replace x with 2010.
$y = 100$	Simplify.

Sample answer: 100 million households

CHECK Your Progress

2 **A. TEMPERATURE** The scatter plot shows the heating bill for the month of January for different size houses. Write an equation in slope-intercept form for the line of fit drawn. Use the data points (1000, 50) and (3500, 250).



A. $y = 0.1x - 50$

B. $y = 0.08x + 30$

C. $y = 0.08x - 30$

D. $y = \frac{1}{15}x - \frac{50}{3}$

0%

A B C D

CheckPoint

CHECK Your Progress

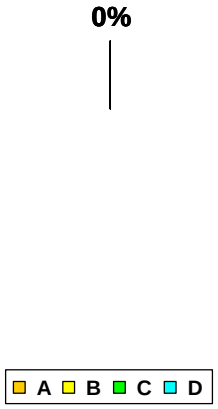
2 **B. Predict the heating bill for a house that is 4100 square feet in size.**

A. about $256.67

B. about $298.00

C. about $358.00

D. about $360.00

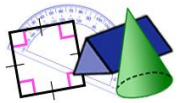


End of the Lesson

Click the mouse button to return to the Chapter Menu.

Chapter Resources Menu

CheckPoint [Five-Minute Checks]

 [Image Bank]

 [Math Tools]

Concepts in Motion

Interactive Lab  [Graphing Equations with Two Variables]

BrainPOP [Slope and Intercept]

Five-Minute CHECK

Lesson 7-1 (over Chapter 6)

Lesson 7-2 (over Lesson 7-1)

Lesson 7-3 (over Lesson 7-2)

Lesson 7-4 (over Lesson 7-3)

Lesson 7-5 (over Lesson 7-4)

Lesson 7-6 (over Lesson 7-5)

Lesson 7-7 (over Lesson 7-6)

Lesson 7-8 (over Lesson 7-7)

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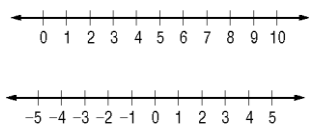
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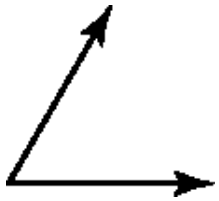

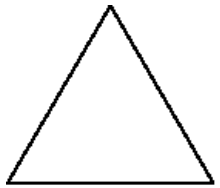

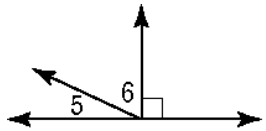
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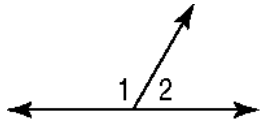
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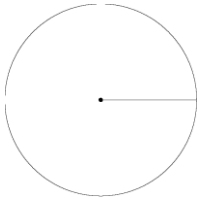

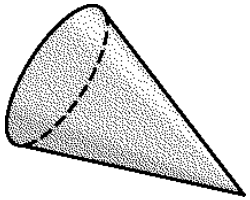

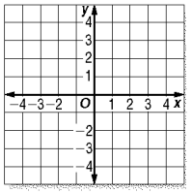
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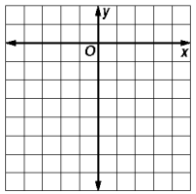
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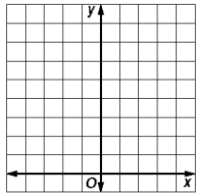
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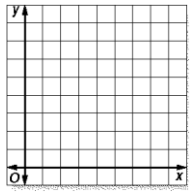
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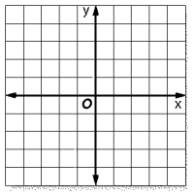
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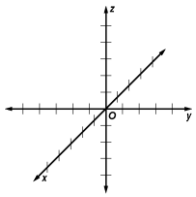
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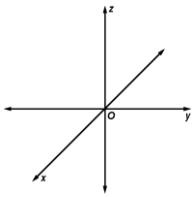
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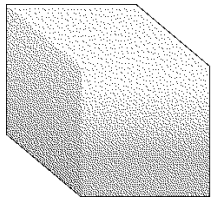

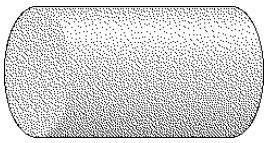

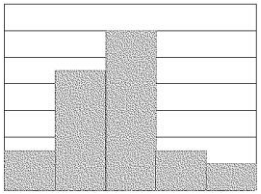

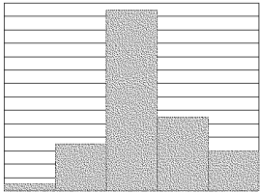

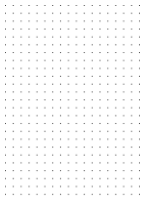

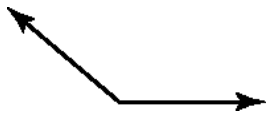

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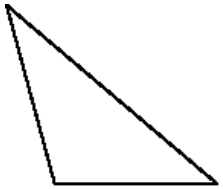
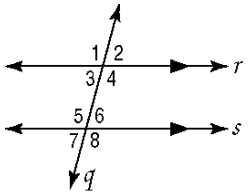
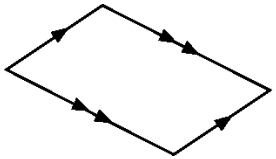
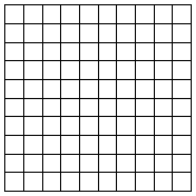
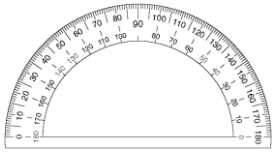
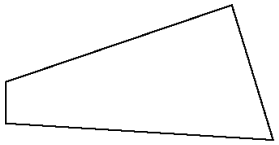


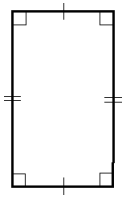


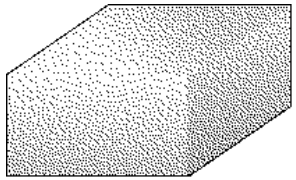


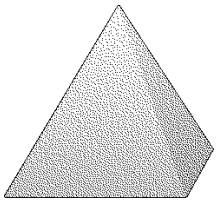


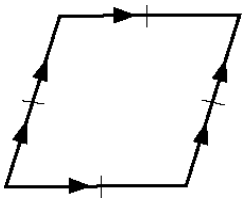


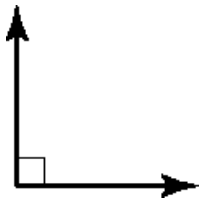


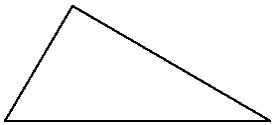


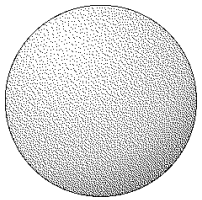


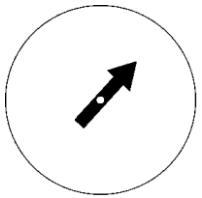


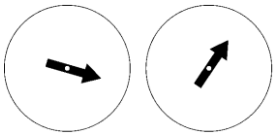


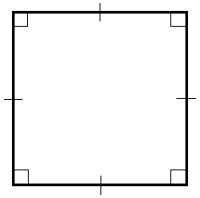












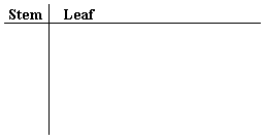
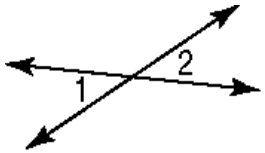
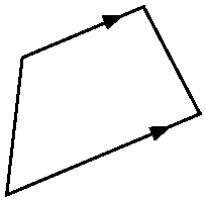
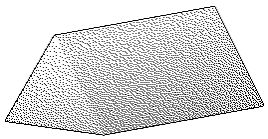
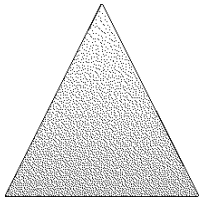


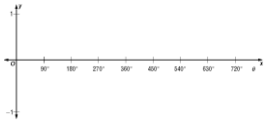
Image Bank

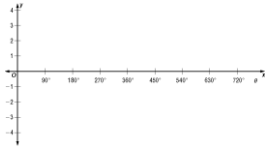


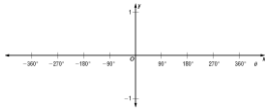


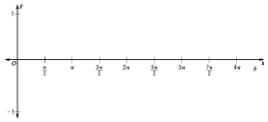


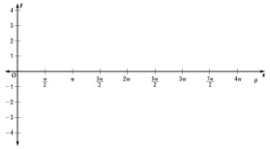












Five-Minute CHECK (over Chapter 6)

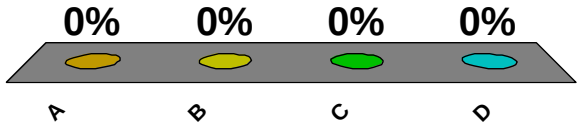
1 Express 24 inches to 6 feet in simplest form.

A. 1 to 3

B. 1 to 4

C. 3 to 1

D. 4 to 1



CheckPoint

Five-Minute CHECK (over Chapter 6)

2 Express 0.045 as a percent.

A. 0.045 percent

B. 0.45 percent

C. 4.5 percent

D. 45 percent

0%

A B C D

CheckPoint

Five-Minute CHECK (over Chapter 6)

3 Express 65 percent as a fraction in simplest form.

A. $\frac{2}{3}$

B. $\frac{3}{5}$

C. $\frac{7}{10}$

D. $\frac{13}{20}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Chapter 6)

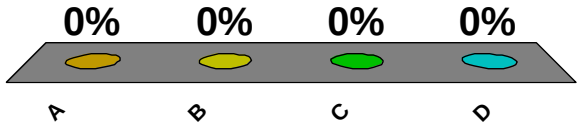
4 30 is 40 percent of what number?

A. 85

B. 75

C. 60

D. 12



CheckPoint

Five-Minute CHECK (over Chapter 6)

5 A pair of sneakers that normally sells for $85 is on sale at a 20 percent discount. What is the sale price of the sneakers?

A. $102

B. $78

C. $68

D. $17

0%

A B C D

CheckPoint

Five-Minute CHECK (over Chapter 6)

Standardized Test Practice

6 What is the annual interest rate if Jim invests $2400 for 3 years and earns $450 in interest?

A. 6.25 percent

0%

B. 6.2 percent

C. 5.65 percent

D. 5.62 percent

A B C D

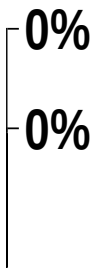
CheckPoint

Five-Minute CHECK (over Lesson 7-1)

1 Determine whether the relation {(–2, –2), (0, 1), (–2, 3), (4, 5)} is a function.

A. yes

B. no



A B

CheckPoint

Five-Minute CHECK (over Lesson 7-1)

2 Determine whether the relation {(4, –4), (–4, 4), (5, –5), (–5, 5), (1, 5)} is a function.

A. yes

B. no

0%
0%

A B

CheckPoint

Five-Minute CHECK (over Lesson 7-1)

3 Determine whether the relation shown in the table is a function.

x	y
−1	−2
3	2
0	0
−1	2
−2	4

A. yes

B. no

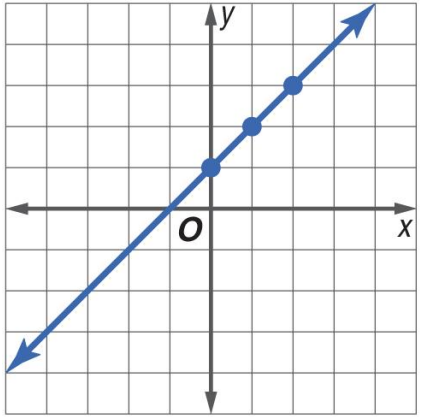
0%

0%

A B

CheckPoint

Five-Minute CHECK (over Lesson 7-1)



4 Determine whether the relation shown in the graph is a function.

A. yes

B. no

0%
0%

A B

CheckPoint

Five-Minute CHECK (over Lesson 7-1)

Standardized Test Practice

5 The relation {(3, 5), (2, –3), (1, 0), (–4, 0), (–2, 5)} is not a function when which ordered pair is added to the set?

A. (0, –4)

B. (–3, 2)

C. (3, –5)

D. (–1, 0)

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-2)

1 **Refer to the table. Which of the following shows the solution of the given equation for the values given in the table?**

x	$y = 3x - 1$	y	(x, y)
−2	3(−2) − 1		
0			
2			
4			

A.

x	$y = 3x - 1$	y	(x, y)
−2	3(−2) − 1	5	(−2, 5)
0	3(0) − 1	−7	(0, −7)
2	3(2) − 1	11	(2,11)
4	3(4) − 1	−1	(4, −1)

B.

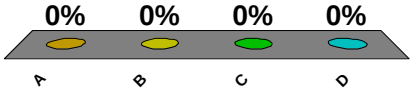
x	$y = 3x - 1$	y	(x, y)
−2	3(−2) − 1	−7	(−2, −7)
0	3(0) − 1	−1	(0, −1)
2	3(2) − 1	5	(2, 5)
4	3(4) − 1	1	(4, 1)

C.

x	$y = 3x - 1$	y	(x, y)
−2	3(−2) − 1	5	(−2, 5)
0	3(0) − 1	2	(0, 2)
2	3(2) − 1	7	(2, 7)
4	3(4) − 1	13	(4, 13)

D.

x	$y = 3x - 1$	y	(x, y)
−2	3(−2) − 1	−7	(−2, −7)
0	3(0) − 1	−1	(0, −1)
2	3(2) − 1	5	(2, 5)
4	3(4) − 1	11	(4, 11)



CheckPoint

Five-Minute CHECK (over Lesson 7-2)

2 Find two solutions of the equation $y = 2x - 4$ and write the solutions as ordered pairs.

A. (0, –4), (1, –2)

B. (1, –2), (2, –3)

C. (3, –2), (0, –4)

D. (2, –3), (3, 2)

0%

A B C D

Five-Minute CHECK (over Lesson 7-2)

3 Find two solutions of the equation $x + y = 12$ and write the solutions as ordered pairs.

A. (4, 8), (14, 2)

0%

B. (4, 16), (7, 5)

C. (4, 8), (7, 5)

D. (4, 16), (14, 2)

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-2)

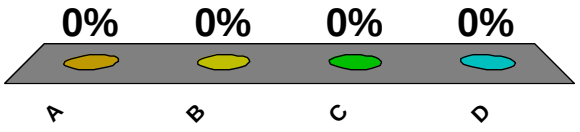
4 The equation $y = 23x$ describes the approximate number of miles y that a car can go on x gallons of gas. About how many miles can the car go on 20 gallons of gas?

A. 500 miles

B. 460 miles

C. 43 miles

D. 1.15 miles



CheckPoint

Five-Minute CHECK (over Lesson 7-2)

Standardized Test Practice

5 **Which is not a linear function?**

A. $y = x$

B. $y + x = 2$

C. $y = -4$

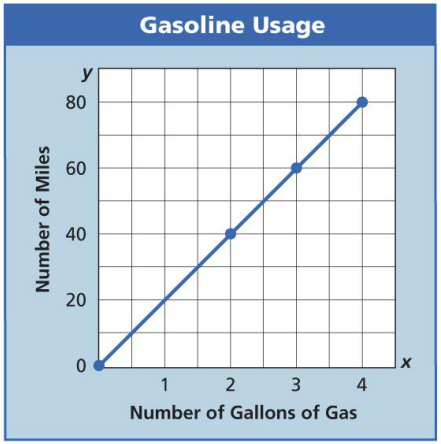
D. $y = \frac{3}{x}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-3)



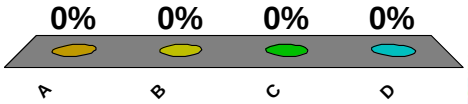
1 **Find the rate of change for the linear function represented in the graph.**

A. increase of 20 miles per gallon

B. decrease of 20 miles per gallon

C. increase of 10 miles per gallon

D. decrease of 10 miles per gallon



CheckPoint

Five-Minute CHECK (over Lesson 7-3)

2 Find the rate of change for the linear function represented in the table.

Time (h)	Temperature (°F)
x	*y*
0	40
1	38
2	36
3	34

A. decrease of 1 degree per hour

B. increase of 1 degree per hour

C. decrease of 2 degrees per hour

D. increase of 2 degrees per hour

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-3)

3 A ski lift is transporting skiers from the base of the mountain to a point near the top of the mountain. After 3 minutes, the lift had traveled 200 feet. After 6 minutes, it had traveled 400 feet. Find the rate of change.

0%

A. 100 feet per minute

B. 66.7 feet per minute

C. 60 feet per minute

D. 55.7 feet per minute

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-3)

Standardized Test Practice

4 The table shows the relationship between time and the distance traveled on a family trip. Which is the best estimate for the rate of change for the family from 1–4 hours?

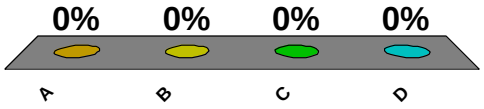
Time (h)	Distance (mi)
x	*y*
1	59
2	123.2
3	187.4
4	251.6

A. 55 miles per hour

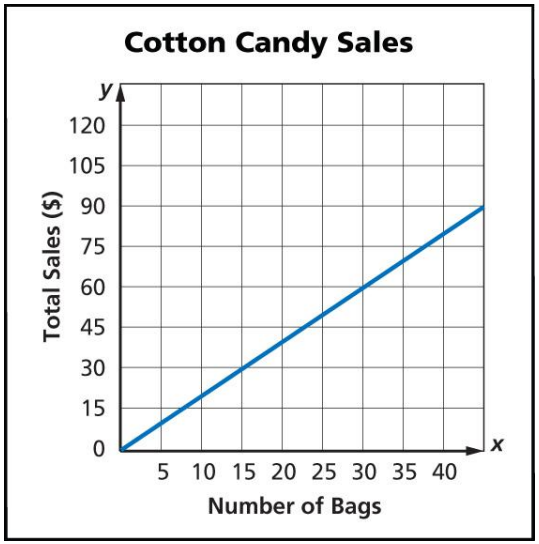
B. 57 miles per hour

C. 60 miles per hour

D. 64 miles per hour



Five-Minute CHECK (over Lesson 7-4)



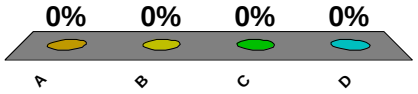
1 **Find the constant rate of change for the linear function.**

A. $1.50 per bag

B. $2.00 per bag

C. $2.50 per bag

D. $3.00 per bag



CheckPoint

Five-Minute CHECK (over Lesson 7-4)

2 Suppose y varies directly with x. Write an equation relating x and y if $y = 6$ when $x = 8$.

A. $y = 48x$

B. $y = \frac{4}{3}x$

C. $y = 2x$

D. $y = \frac{3}{4}x$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-4)

3 Suppose y varies directly with x. Write an equation relating x and y if $y = -20$ when $x = 5$.

A. $y = -\frac{1}{4}x$

0%

B. $y = -4x$

C. $y = \frac{1}{4}x$

D. $y = 4x$

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-4)

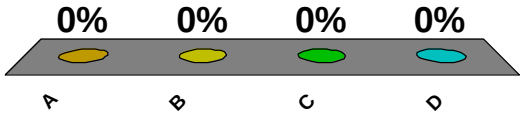
4 The cost of fencing varies directly with the number of feet of fencing purchased. If 1 foot of fencing costs $1.75, find the cost of 200 feet.

A. $350.00

B. $300.00

C. $135.00

D. $115.00



CheckPoint

Five-Minute CHECK (over Lesson 7-4)

Standardized Test Practice

5 What is the *y*-intercept of the equation $y = 0.5x$?

A. 0

B. 0.5

C. 1

D. 2

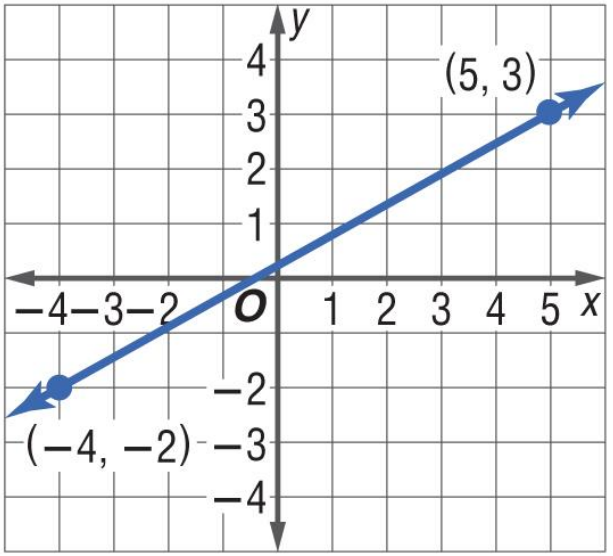
0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-5)

1 **Find the slope of the line on the graph.**

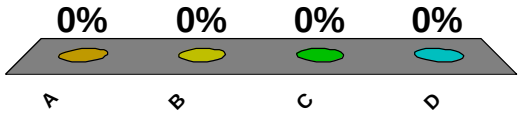


A. –1

B. $\frac{5}{9}$

C. 1

D. $\frac{9}{5}$



CheckPoint

Five-Minute CHECK (over Lesson 7-5)

2 Find the slope of the line that passes through the points $E(1, 4)$ and $F(5, -2)$.

A. $-\frac{3}{2}$

B. $-\frac{1}{2}$

C. 2

D. 3

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-5)

3 Find the slope of the line that passes through the points $G(0, -7)$ and $H(2, -7)$.

A. undefined

0%

B. 1

C. 0

D. –1

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-5)

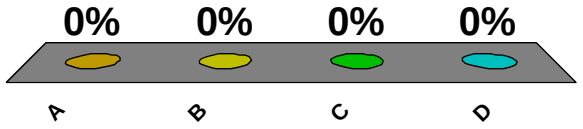
4 Find the slope of the line that passes through the points $J(0, 0)$ and $K(4, -4)$.

A. 1

B. $\frac{1}{4}$

C. $-\frac{1}{4}$

D. –1



CheckPoint

Five-Minute CHECK (over Lesson 7-5)

5 Find the slope of a line that decreases 4 units vertically for every 10-unit horizontal increase.

A. $-\frac{5}{2}$

B. $-\frac{2}{5}$

C. $\frac{2}{5}$

D. $\frac{5}{2}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-5)

Standardized Test Practice

6 The slope of a line passing through the point (5, –2) is undefined. Through which other point does the line pass?

A. (–2, 5) 0%

B. (–5, –2)

C. (5, 2)

D. (–5, 2)

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-6)

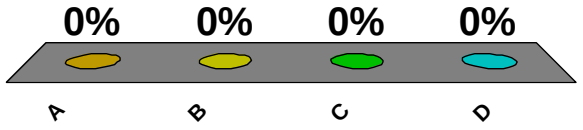
1 State the slope and the *y*-intercept for the graph of the equation $y = x + 5$.

A. slope = 5, *y*-intercept = 1

B. slope = –1, *y*-intercept = –5

C. slope = –5, *y*-intercept = –1

D. slope = 1, *y*-intercept = 5



CheckPoint

Five-Minute CHECK (over Lesson 7-6)

2 State the slope and the y-intercept for the graph of the equation $y = \frac{1}{2}x - 3$.

A. slope $= \frac{1}{2}$, y-intercept $= 3$

B. slope $= \frac{1}{2}$, y-intercept $= -3$

C. slope $= -3$, y-intercept $= \frac{1}{2}$

D. slope $= 3$, y-intercept $= \frac{1}{2}$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-6)

3 State the slope and the *y*-intercept for the graph of the equation $x + y = 4$.

A. slope = 1, *y*-intercept = 4

0%

B. slope = 4, *y*-intercept = –1

C. slope = –1, *y*-intercept = 4

D. slope = 4, *y*-intercept = 1

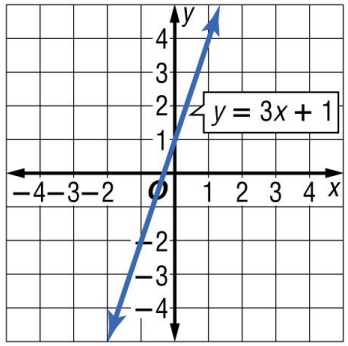
A B C D

CheckPoint

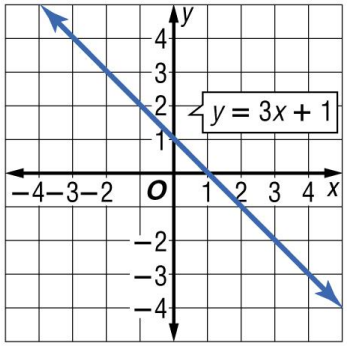
Five-Minute CHECK (over Lesson 7-6)

4 Identify the graph of $y = 3x + 1$ using the slope and the y-intercept.

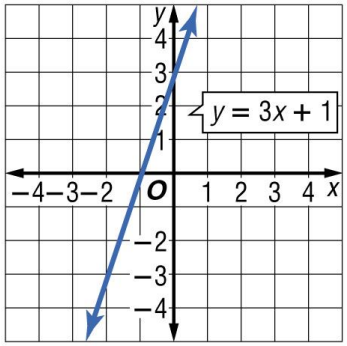
A.



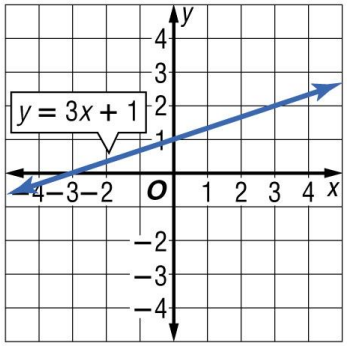
B.

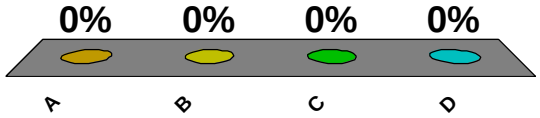


C.



D.





CheckPoint

Five-Minute CHECK (over Lesson 7-6)

5 The printer charged a flat rate of $65.00 to print invitations, plus an additional charge of $0.15 per invitation for the art on them. Write an equation to show the total cost t of buying x invitations.

A. $t = 65x + 0.15$

B. $t = 0.15x + 65$

C. $x = 0.15t + 65$

D. $x = 65t + 0.15$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-6)

Standardized Test Practice

6 Write $3x + 2y = 6$ in slope-intercept form.

A. $x = \frac{2}{3}y - 2$

B. $y = -\frac{2}{3}x - 3$

C. $x = 2 - \frac{2}{3}y$

D. $y = -\frac{3}{2}x + 3$

0%

A B C D

Five-Minute CHECK (over Lesson 7-7)

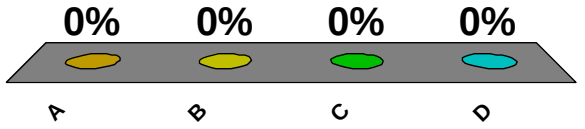
1 **Write an equation in slope-intercept form for the line if its slope = 1 and *y*-intercept = –1.**

A. $y = x + 1$

B. $y = -x - 1$

C. $y = x - 1$

D. $y = -x + 1$



CheckPoint

Five-Minute CHECK (over Lesson 7-7)

2 **Write an equation in slope-intercept form for the line if its** slope $= \frac{1}{4}$, y-intercept $= 0$.

A. $y = \frac{1}{4}$

B. $y = 4x$

C. $y = x + \frac{1}{4}$

D. $y = \frac{1}{4}x$

0%

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-7)

3 Write an equation in slope-intercept form for the line passing through the pair of points (1, 1) and (–1, –7).

A. $y = 4x - 3$ 0%

B. $y = 3x + 4$

C. $y = 4x - 27$

D. $y = 3x + 27$

A B C D

CheckPoint

Five-Minute CHECK (over Lesson 7-7)

4 Write an equation in slope-intercept form for the table of values.

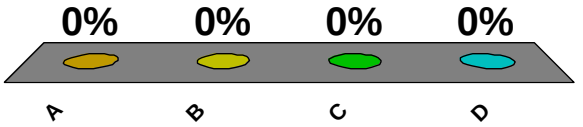
x	−2	0	2	4
y	5	3	1	−1

A. $y = -x + 1$

B. $y = -x + 3$

C. $y = x - 3$

D. $y = x$



CheckPoint

Five-Minute CHECK (over Lesson 7-7)

Standardized Test Practice

5 The charges for a long distance telephone company are shown in the table. Which equation shows the cost y for x minutes of phone calls in a month?

Charges per Month	
Flat rate	$5.00
Per minute of calling	$0.07

A. $y = 0.07x + 5$

0%

B. $y = 5x + 0.007$

C. $y = 7x + 5$

D. $y = 0.07x - 5$

A B C D