Vocabulary

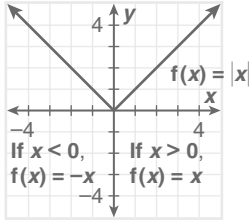
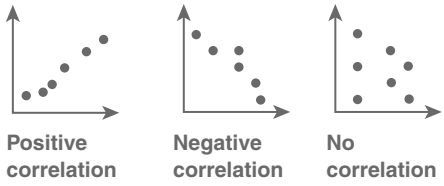
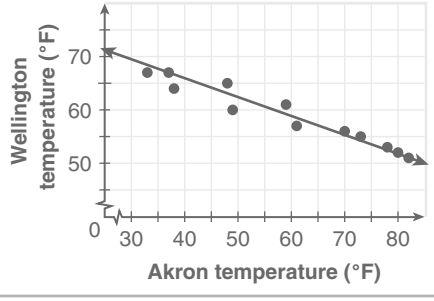
The table contains important vocabulary terms from Chapter 2. As you work through the chapter, fill in the page number, definition, and a clarifying example.

Term	Page	Definition	Clarifying Example
absolute value function			
correlation			
identity			
indirect measurement			
line of best fit			

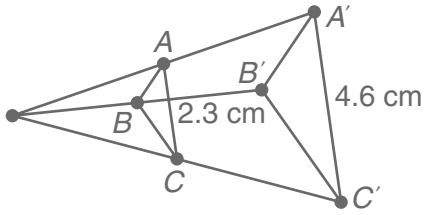
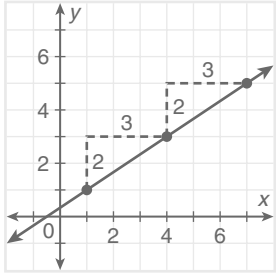
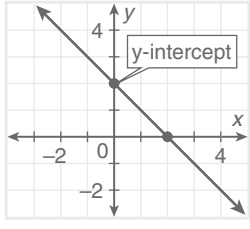
CHAPTER 2

Vocabulary

The table contains important vocabulary terms from Chapter 2. As you work through the chapter, fill in the page number, definition, and a clarifying example.

Term	Page	Definition	Clarifying Example
absolute value function	158	A function whose rule contains absolute-value expressions.	
correlation	142	A measure of the strength and direction of the relationship between two variables or data sets.	
identity	92	An equation that is true for all values of the variables.	$3 = 3$ $2(x - 1) = 2x - 2$
indirect measurement	99	A method of measurement that uses formulas, similar figures, and/or proportions.	$\frac{4}{5} = \frac{60}{h}$ $\frac{\text{shadow of friend}}{\text{height of friend}} = \frac{\text{shadow of cliff}}{\text{height of cliff}}$
line of best fit	142	The line that comes closest to all of the points in a data set.	

Term	Page	Definition	Clarifying Example
linear function			
proportion			
rate			
scale factor			
slope			
y-intercept			

Term	Page	Definition	Clarifying Example
linear function	105	A function that can be written in the form $y = mx + b$, where x is the independent variable and m and b are real numbers. Its graph is a line.	$y = 2x - 1$
proportion	97	A statement that two ratios are equal; $\frac{a}{b} = \frac{c}{d}$	$\frac{2}{3} = \frac{4}{6}$
rate	98	A ratio that compares two quantities measured in different units.	$\frac{55 \text{ miles}}{1 \text{ hour}} = 55$ mi/h
scale factor	99	The multiplier used on each dimension to change one figure into a similar figure.	
slope	106	A measure of the steepness of a line. If (x_1, y_1) and (x_2, y_2) are any two points on the line, the slope of the line, known as m, is represented by the equation $m = \frac{y_2 - y_1}{x_2 - x_1}$.	 slope $= \frac{4 - 3}{4 - 1}$
y-intercept	106	The y-coordinate(s) of the point(s) where a graph intersects the y-axis.	

Chapter Review

2-1 Solving Linear Equations and Inequalities

Solve.

1. $18 + 6x = 4x$

2. $\frac{4}{3}(5x + 1) = 8$

3. $14 - 17x = 27 - 7x$

4. $3(x - 2) + 5(x + 5) = -3$

Solve and graph.

5. $32 < 8 + 6y$

6. $3 - 9x < 39$

7. $4x - 3(5x + 12) \geq 8$

8. $8(2t + 1) > 4(7t + 7)$

Write an equation or inequality, and solve.

9. A barbeque catering company charges a $45 set up fee plus $18 per person. The cost of the annual picnic cannot exceed $720. How many people can attend the barbecue?

2-2 Proportional Reasoning

Solve each proportion.

10. $\frac{x}{8} = \frac{9}{3}$

11. $\frac{8}{9} = \frac{4x}{11}$

12. $\frac{5.2}{-x} = \frac{3.2}{6}$

13. $\frac{4}{5} = \frac{5}{3x - 2}$

14. If a 4-feet tall child standing on the beach casts a 6 foot shadow, how long a shadow would a 10-feet high lifeguard station cast at the same time of day?

Chapter Review

2-1 Solving Linear Equations and Inequalities

Solve.

1. $18 + 6x = 4x$ $x = -9$

2. $\frac{4}{3}(5x + 1) = 8$ $x = 1$

3. $14 - 17x = 27 - 7x$

$x = -1.3$

4. $3(x - 2) + 5(x + 5) = -3$

$x = -2.75$

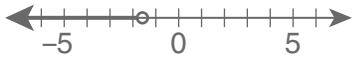
Solve and graph.

5. $32 < 8 + 6y$ $y > 4$

6. $3 - 9x < 39$ $x > -4$

7. $4x - 3(5x + 12) \geq 8$ $x \leq -4$

8. $8(2t + 1) > 4(7t + 7)$ $t < -\frac{5}{3}$



Write an equation or inequality, and solve.

9. A barbeque catering company charges a $45 set up fee plus $18 per person. The cost of the annual picnic cannot exceed $720. How many people can attend the barbecue?

At most, 37 people can attend the barbecue.

2-2 Proportional Reasoning

Solve each proportion.

10. $\frac{x}{8} = \frac{9}{3}$ $x = 24$

11. $\frac{8}{9} = \frac{4x}{11}$ $x = \frac{22}{9}$

12. $\frac{5.2}{-x} = \frac{3.2}{6}$ $x = -9.75$

13. $\frac{4}{5} = \frac{5}{3x - 2}$ $x = 2.75$

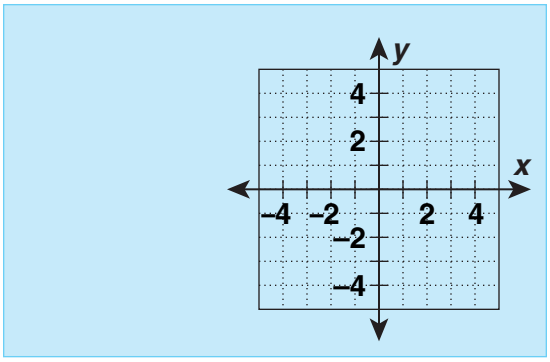
14. If a 4-feet tall child standing on the beach casts a 6 foot shadow, how long a shadow would a 10-feet high lifeguard station cast at the same time of day?

15 feet

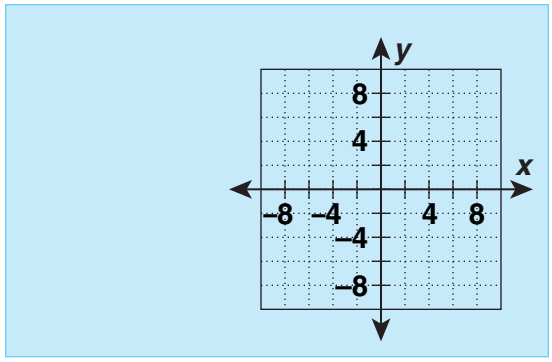
2-3 Graphing Linear Functions

Find the intercepts. Then graph.

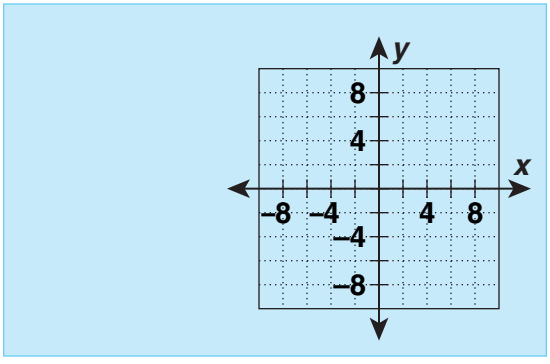
15. $3x + 2y = 6$



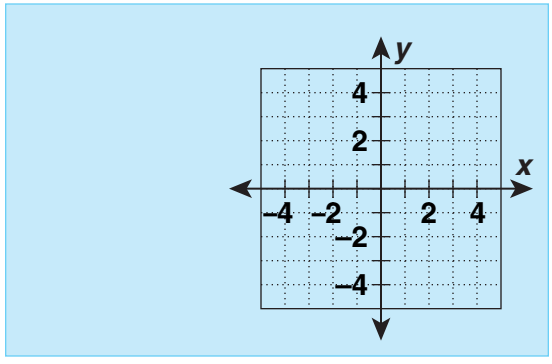
16. $4x - 2y = 20$



17. $\frac{2}{3}x + 2y = 6$

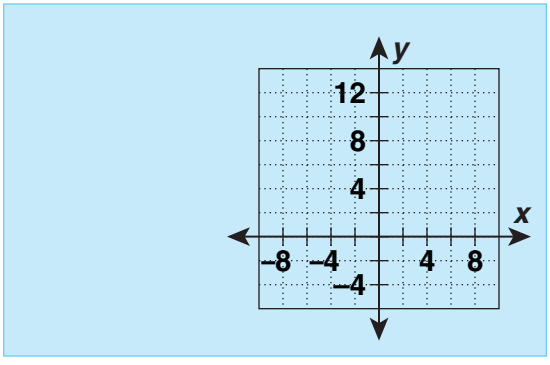


18. $-x + y = \frac{5}{2}$

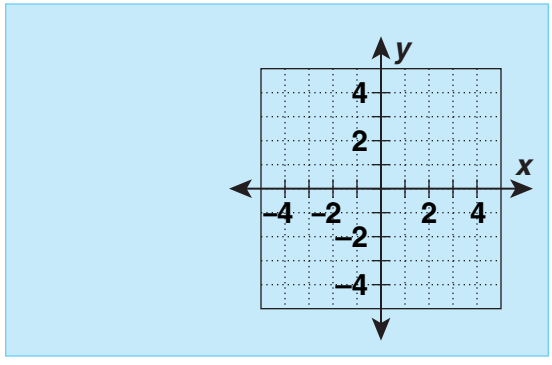


Write each function in slope-intercept form. Then graph.

19. $y - 4x = 12$



20. $3x + 4y = 12$

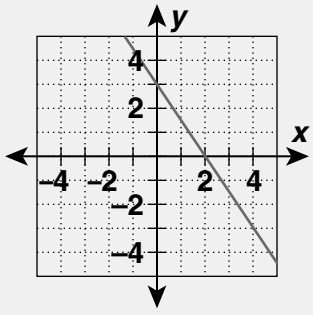


2-3 Graphing Linear Functions

Find the intercepts. Then graph.

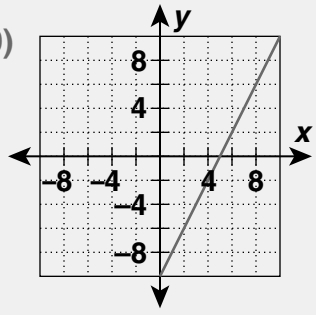
15. $3x + 2y = 6$

(0, 3); (2, 0)



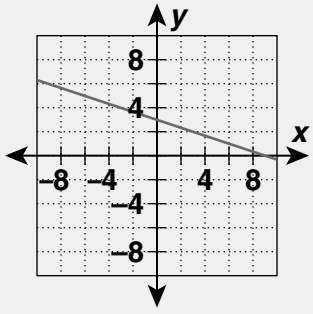
16. $4x - 2y = 20$

(0, −10); (5, 0)



17. $\frac{2}{3}x + 2y = 6$

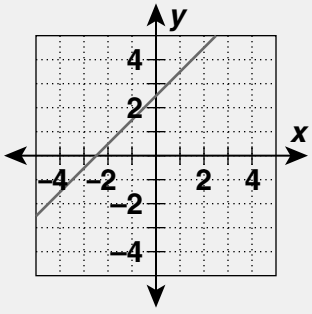
(0, 3); (9, 0)



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

$\left(0, \frac{5}{2}\right)$;

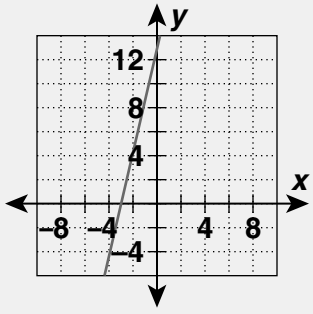
$\left(-\frac{5}{2}, 0\right)$



Write each function in slope-intercept form. Then graph.

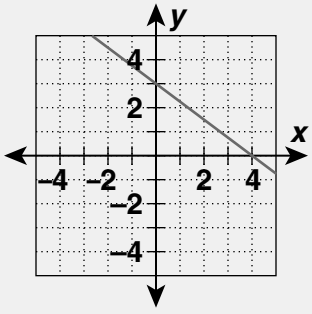
19. $y - 4x = 12$

$y = 4x + 12$



20. $3x + 4y = 12$

$y = -\frac{3}{4}x + 3$



2-4 Writing Linear Functions

Write an equation in slope-intercept form for each line.

21. through (4, 19) and (6, 31)

22. passing through (3, −2) and slope $\frac{2}{3}$

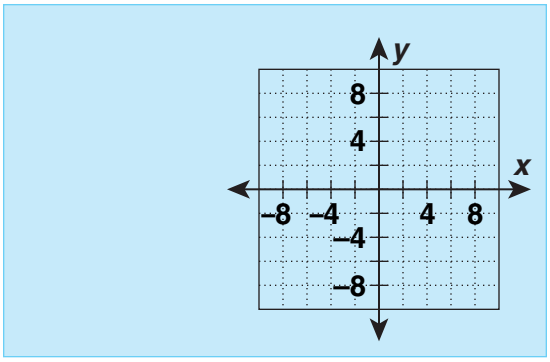
23. through (4, 7) and parallel to $y = \frac{1}{2}x + 3$

24. through (−7, −1) and perpendicular to $7x + 2y = 14$

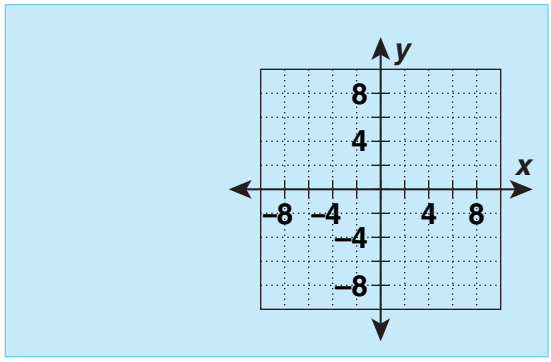
2-5 Linear Inequalities in Two Variables

Solve for *y*. Graph the solution.

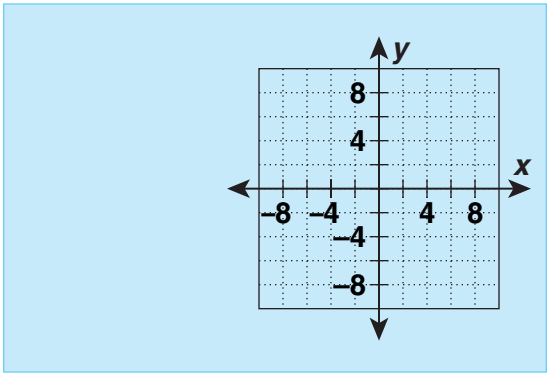
25. $y - 3 \leq 6$



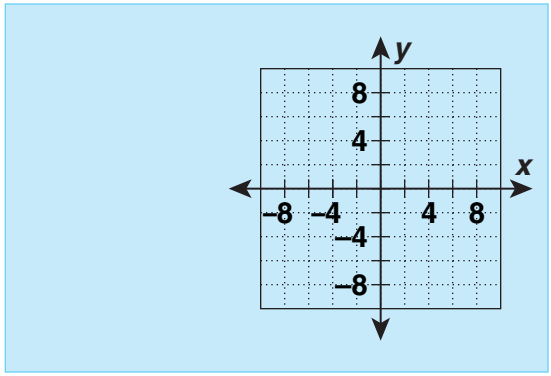
26. $6x + 2y > 12$



27. $6x + 4y < 3x - 8$



28. $2(2x - 3) + y > 4x - 8$



2-4 Writing Linear Functions

Write an equation in slope-intercept form for each line.

21. through (4, 19) and (6, 31) $x = 6x - 5$

22. passing through (3, −2) and slope $\frac{2}{3}$ $y = \frac{2}{3}x - 4$

23. through (4, 7) and parallel to $y = \frac{1}{2}x + 3$ $y = \frac{1}{2}x + 5$

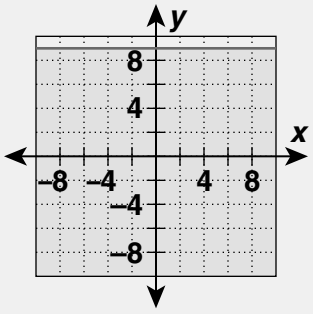
24. through (−7, −1) and perpendicular to $7x + 2y = 14$ $y = \frac{2}{7}x + 1$

2-5 Linear Inequalities in Two Variables

Solve for *y*. Graph the solution.

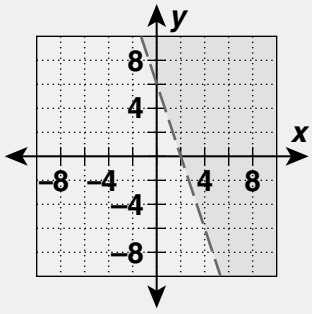
25. $y - 3 \leq 6$

$y \leq 9$



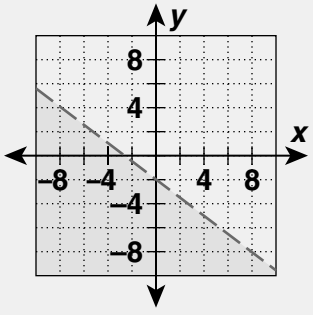
26. $6x + 2y > 12$

$y > -3x + 6$



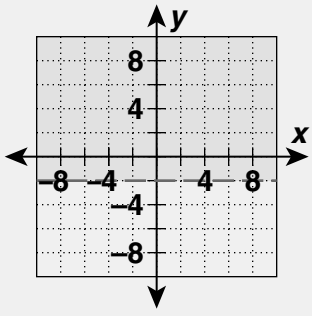
27. $6x + 4y < 3x - 8$

$y < -\frac{3}{4}x - 2$



28. $2(2x - 3) + y > 4x - 8$

$y > -2$



2-6 Transforming Linear Functions

Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.

29. $f(x) = 2x$ vertical translation 3 units up

30. $f(x) = 4x$ vertical stretch by a factor of 6

31. $f(x) = x + 4$ vertical compression by a factor of $\frac{1}{4}$ followed by a horizontal translation right 3 units

32. $f(x) = 2x - 4$ vertical translation 6 units up followed by a horizontal stretch with a factor of $\frac{2}{3}$

2-7 Curve-Fitting with Linear Models

33. Find the following for the given table of data.

Source: http://www.tinet.ita.doc.gov/view/f-2000-04-001/index.html

Year x	Foreign Travelers to U.S. (in millions)
1994	4.48
1995	4.33
1996	4.65
1997	4.78
1998	4.64
1999	4.85
2000	5.09

a. Make a scatter plot of the data using years as the independent variable.

b. Find the correlation coefficient r and the line of best fit for the data.

2-6 Transforming Linear Functions

Let $g(x)$ be the indicated transformation of $f(x)$. Write the rule for $g(x)$.

29. $f(x) = 2x$ vertical translation 3 units up

$g(x) = 2x + 3$

30. $f(x) = 4x$ vertical stretch by a factor of 6

$g(x) = 24x$

31. $f(x) = x + 4$ vertical compression by a factor of $\frac{1}{4}$ followed by a horizontal translation right 3 units

$g(x) = \frac{1}{4}x + \frac{1}{4}$

32. $f(x) = 2x - 4$ vertical translation 6 units up followed by a horizontal stretch with a factor of $\frac{2}{3}$

$g(x) = \frac{4}{3}x + 2$

2-7 Curve-Fitting with Linear Models

33. Find the following for the given table of data.

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Year x	Foreign Travelers to U.S. (in millions)
1994	4.48
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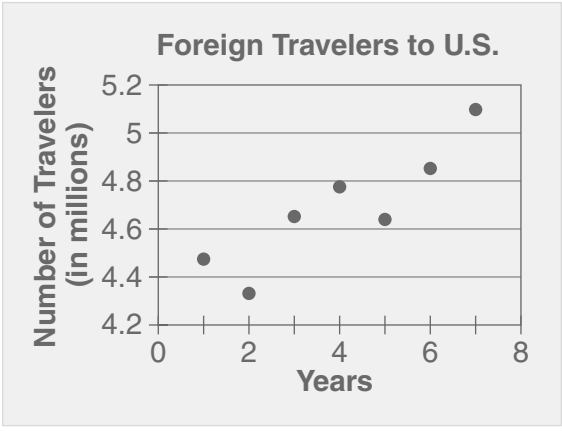
2000	5.09

a. Make a scatter plot of the data using years as the independent variable.



b. Find the correlation coefficient r and the line of best fit for the data.

Answers will vary depending on the points used. Using (1, 4.33) and (5, 4.85), $y = 0.13x - 4.2$. The correlation coefficient is 0.8867

2-8 Solving Absolute-Value Equations and Inequalities

Solve.

34. $|18 - 6x| = 30$

35. $5|x| - 3 = 37$

Solve each inequality. Then graph the solution.

36. $|3x + 9| > 15$

37. $\frac{|x + 2|}{3} \leq 4$

38. $3|4x - 6| - 2 > 4$

39. $|9x + 2| - 3 \geq 17$

2-9 Absolute Value Functions

Translate $f(x) = |x|$ so that the vertex is at the given point.

40. $(-1, 4)$

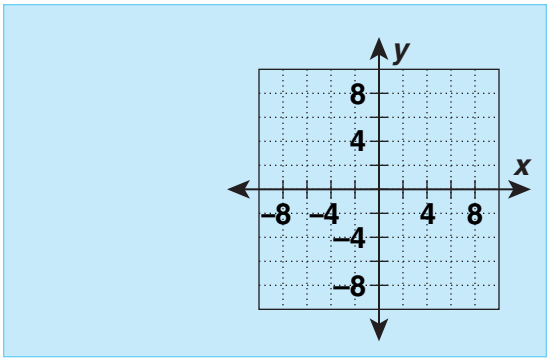
41. $(2, 0)$

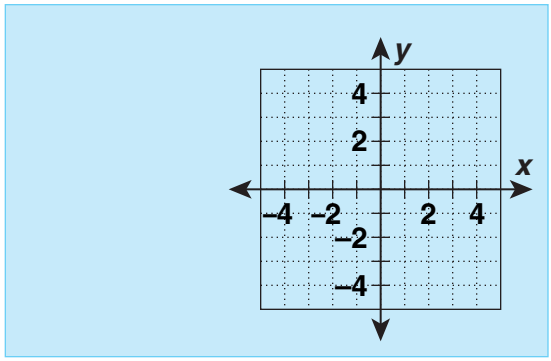
42. $(3, -4)$

Perform each transformation. Then graph.

43. $f(x) = |x - 4|$ reflected across the y-axis

44. $f(x) = |3x + 1|$ compressed vertically by $\frac{1}{3}$





2-8 Solving Absolute-Value Equations and Inequalities

Solve.

34. $|18 - 6x| = 30$

$x = -2$ or $x = 8$

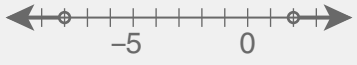
35. $5|x| - 3 = 37$

$x = \pm 8$

Solve each inequality. Then graph the solution.

36. $|3x + 9| > 15$

$x > 2$ or $x < -8$

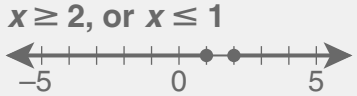


37. $\frac{|x + 2|}{3} \leq 4$

$-14 \leq x \leq 10$

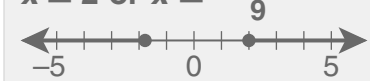
38. $3|4x - 6| - 2 > 4$

$x \geq 2$, or $x \leq 1$



39. $|9x + 2| - 3 \geq 17$

$x \geq 2$ or $x \leq -\frac{22}{9}$



2-9 Absolute Value Functions

Translate $f(x) = |x|$ so that the vertex is at the given point.

40. $(-1, 4)$

$g(x) = |x + 1| + 4$

41. $(2, 0)$

$g(x) = |x - 2|$

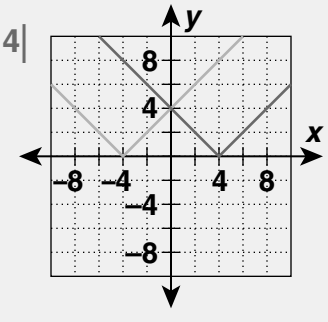
42. $(3, -4)$

$g(x) = |x - 3| - 4$

Perform each transformation. Then graph.

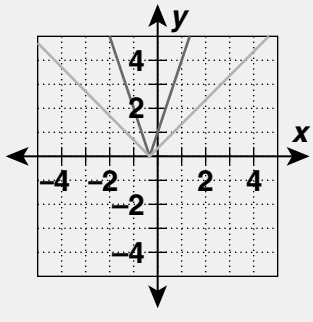
43. $f(x) = |x - 4|$ reflected across the y-axis

$f(x) = |-x - 4|$



44. $f(x) = |3x + 1|$ compressed vertically by $\frac{1}{3}$

$f(x) = \frac{1}{3}|3x + 1|$



CHAPTER 2

Big Ideas

Answer these questions to summarize the important concepts from Chapter 2 in your own words.

1. Explain how inverse operations are used to solve equations.

2. Why do absolute-value equations sometimes have no solution or two solutions?

3. Compare ratios, rates, and proportions.

4. Explain why 0.25, one quarter, 25%, and $\frac{1}{4}$ all represent the same value.

For more review of Chapter 2:

- Complete the Chapter 2 Study Guide and Review on pages 166–169 of your textbook.
- Complete the Ready to Go On quizzes on pages 133 and 165 of your textbook.

CHAPTER 2

Big Ideas

Answer these questions to summarize the important concepts from Chapter 2 in your own words.

1. Explain how inverse operations are used to solve equations.

Answers will vary. Possible answer: Inverse operations are used to undo an operation in order to isolate a variable. If you are adding 5 to each side of an equation, you subtract five to undo the addition. The same applies for multiplication and division.

2. Why do absolute-value equations sometimes have no solution or two solutions?

Answers will vary. Possible answer: The absolute value is the distance a number is from zero, so there are two possible equivalent expressions. When simplified sometimes an absolute value equation is equal to a negative number and this can never be true; the equation would have no solution.

3. Compare ratios, rates, and proportions.

Answers will vary. Possible answer: The ratio is a comparison of two numbers by division. A proportion states that two ratios are equal and a rate is a ratio of two measurements having different units of measure.

4. Explain why 0.25, one quarter, 25%, and $\frac{1}{4}$ all represent the same value.

Answers will vary. Possible answer: If you write 0.25, one quarter, 25% and $\frac{1}{4}$ in the same form, for example, as decimals, each number would be written as 0.25.

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