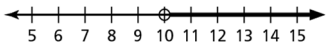
# Answers

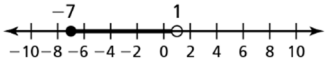
**8.** $x \leq -\frac{1.4}{c}$ **9.** $x < -9c$

**10.** $-\frac{4}{9}$ **11.** Car A

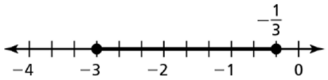
**12.** $t > 10$;



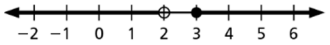

**13.** $-7 \leq y < 1$;




**14.** $-3 \leq x \leq -\frac{1}{3}$




**15.** $b < 2$ *or* $b \geq 3$;




**16.** $-81$

### *Chapter 2 Test Prep*

**1.** $15a + 3$ **2.** B **3.** C

**4.** $m = -6$ **5.** $-5$ **6.** D

**7.** D **8.** B, C, E

**9.** $\frac{1}{3}b + 10 \geq 12$ **10.** B

**11.** C **12.** A **13.** C **14.** B

**15.** A **16.** B **17.** B, C, F **18.** $a = 5$

**19.** 288 square yards

## Chapter 3

### *3.1 Extra Practice*

**1.** not a function; The input −2 has two outputs, 4 and 5.

**2.** function; Every input has exactly one output.

**3.** not a function; A vertical line can be drawn through (2, 2) and (2, 3).

**4.** function; No vertical line can be drawn through more than one point on the graph.

**5.** domain: 0, 1, 2, 3, 4, 5; range: 3, 4

**6.** domain: $-3 \leq x \leq 3$; range: $0 \leq y \leq 3$

**7. a.** yes; The total number of pages of text printed is the dependent variable and the number of minutes is the independent variable.

**b.** domain: $0 \leq x \leq 4\frac{1}{6}$; range: $0 \leq y \leq 50$

**8.** no; Each employee has more than one animal assigned.

### *3.1 Review & Refresh*

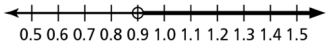
**1.** no **2.** 14.4 **3.** 70%

**4.** $n = -8.7$ **5.** $x = 1$ **6.** $c = -9$

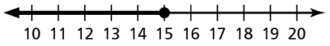
**7.** $h = -34$

**8.** not a function; The input –2 has two outputs, 4 and 0.

**9.** $y > 0.9$;

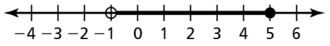



**10.** $x \leq 15$;




**11.** $3 \leq x \leq 11$;


**12.** $-1 < m \leq 5$;




**13.** domain: $-3 \leq x \leq 2$; range: $-1 \leq y \leq 1$

**14.** $a = -6$ **15.** $x \leq -3$ *or* $x > 4$

**16.** 87% or higher **17.** $y = 2 + \frac{1}{4}x$

**18.** 21,312 in.$^2$

### *3.2 Extra Practice*

**1.** $x$-intercepts: about –1, 2, 3, $y$-intercept: about 6

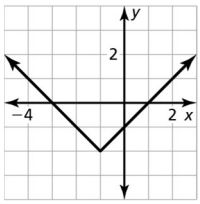
**2.** $x$-intercept: about –0.25, $y$-intercept: about 1

**3.** positive: $x < -4$ and $x > 0$, negative: $-4 < x < 0$, increasing: $x > -2$, decreasing: $x < -2$; $y \to +\infty$ as $x \to -\infty$ and $y \to +\infty$ as $x \to +\infty$

**4.** negative: all real numbers, increasing: all real numbers; $y \to -\infty$ as $x \to -\infty$ and $y \to 0$ as $x \to +\infty$

# Answers

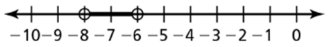
**5.** *Sample answer:*



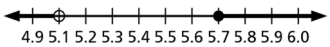

**6.** Your soccer ball reaches a greater maximum height and your friend's soccer ball travels a greater horizontal distance.

### 3.2 Review & Refresh

**1.** $-8 < n < -6$;




**2.** $k < 5.1$ *or* $k \geq 5.7$;




**3.** $b = -15$

**4.** $x = -40$

**5.** $t = \frac{1}{3}$

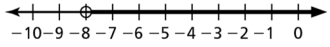
**6.** $n = 13$

**7.** comic book and R & B song

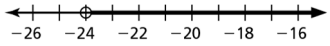
**8.** 6

**9.** $x$-intercepts: about –1.5, –1, 0.5, 1;
$y$-intercept: about 0.75

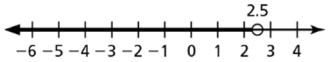
**10.** $x \geq -8$;



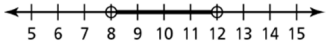

**11.** $r \geq -24$;




**12.** $x < 2.5$;




**13.** $8 < x < 12$;




**14.** (a) *Sample answer:* (–8, –10); Each input has exactly one output. (b) *Sample answer:* (–3, 7); The input –3 has two outputs, –2 and 7.

### 3.3 Extra Practice

**1.** nonlinear; The graph is not a line.

**2.** linear; The graph is a nonvertical line.

**3.** linear; As $x$ increases by 1, $y$ increases by 3. The rate of change is constant.

**4.** nonlinear; As $x$ increases by 1, $y$ varies by different amounts. The rate of change is not constant.

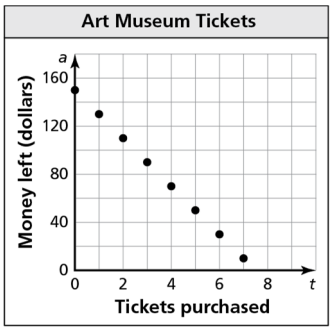
**5.** linear; It can be rewritten as $y = -2x + 3$.

**6.** nonlinear; It cannot be rewritten in the form $y = mx + b$.

**7. a.** 150 represents the amount of money the art club can spend, $20t$ represents the amount of money the club spends on $t$ tickets, 20 represents the cost of each ticket

**b.** 0, 1, 2, 3, 4, 5, 6, 7; discrete; *Sample answer:* The number $t$ of tickets bought must be a whole number.

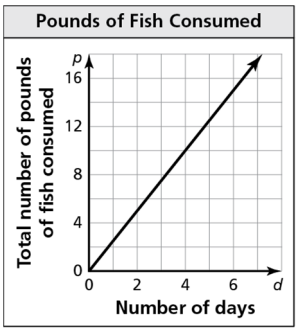
**c.**




**8. a.** yes; As the number $d$ of days increases by 1, the total number $p$ of pounds of fish consumed increases by 2.5. The rate of change is constant. So, the solution represents a linear function.

**b.** $p \geq 0$; continuous; It is possible to eat a portion of a pound.

**c.**




### 3.3 Review & Refresh

**1.** $y = -4$

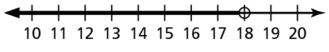
**2.** $w = -3, w = 2$

**3.** $4\frac{1}{8}$

**4.** $\frac{2}{19}$

**5.** no; The graph does not pass through the origin.

**6.** $9 + b < 27$;



# Answers

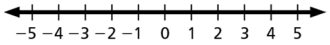
**7.** discrete; The number of rooms must be a whole number.

**8. a.** yes; the number of calories you consume is the dependent variable, the number of granola bars you eat is the independent variable

**b.** domain: $0 \le x \le 8$; range: $0 \le y \le 760$; continuous; You can eat part of a granola bar.

**9.** positive: $x < -2$ and $x > 1$, negative: $-2 < x < 1$, increasing: $x > -0.5$, decreasing: $x < -0.5$; $y \to +\infty$ as $x \to -\infty$ and $y \to +\infty$ as $x \to +\infty$

**10.** all real numbers




**11.** $3.09 \times 10^{-6}$

### *3.4 Extra Practice*

**1.** $-20$; 0; 10 **2.** 13; 12; 11.5 **3.** $-8$; 4; 10

**4. a.** You have 8 video games before making any trips to the game store.

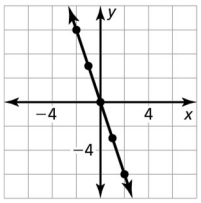
**b.** After 3 trips to the game store, you have 14 video games.

**c.** You have more video games after 5 trips to the game store than you had after 3 trips to the game store.

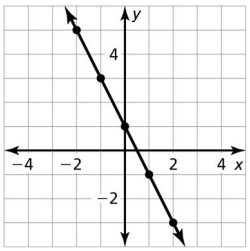
**d.** After 7 trips to the game store, you have 10 more video games than you had after 2 trips.

**5.** $x = 7$ **6.** $x = -10$

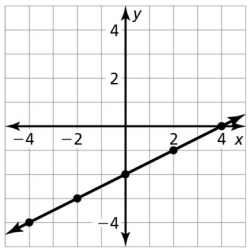
**7.**



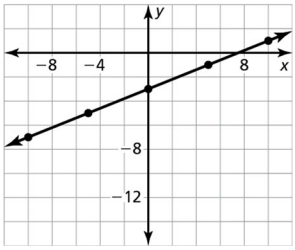

**8.**




**9.**




**10.**



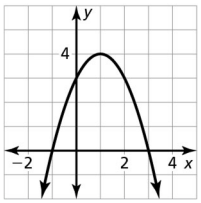

**11.** You have the best savings plan. Your account is linear. Every month, your balance increases by \$50. Your friend's account is also linear. Every month, your friend's balance increases by \$40. After 10 months, you and your friend have the same balance. Each month after that, your balance is more than your friend's balance, and the difference of the balances increases by \$10 more than the previous month.

**12. a.** $\left(\frac{1}{2}, 6\right)$ **b.** $(9, 7.2)$

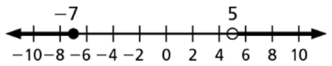
**13.** $64 - 2x$

### *3.4 Review & Refresh*

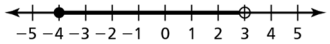
**1.**




**2.** $a \le -7$ *or* $a > 5$;




**3.** $-4 \le k < 3$;




**4.** not a function; The input –1 has two outputs, –2 and 4.

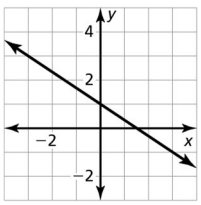
**5.** $\frac{m}{12} + 3 \le -2.6$ **6.** $x = 9$

**7.** $x = \frac{z}{2 - 3y}$ **8.** \$14.99

**9.** nonlinear; The graph is not a line.

**10.** 13 and 15

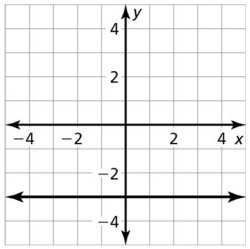
**11.**



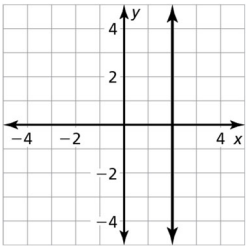
# Answers

### 3.5 Extra Practice

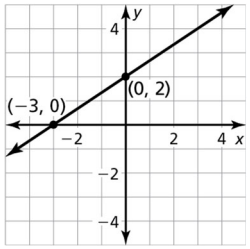
**1.**



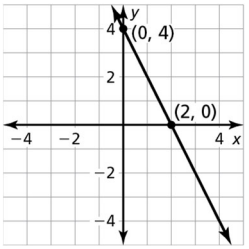
**2.**



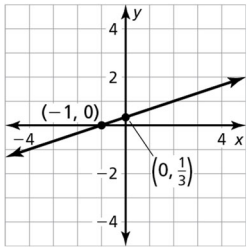
**3.**



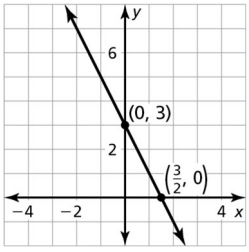

**4.**




**5.**

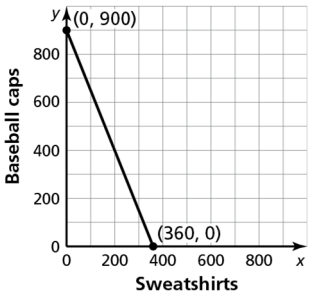



**6.**




**7. a.** $25x$ represents the total cost of sweatshirts at \$25 per sweatshirt. $10y$ represents the total cost of baseball caps at \$10 per baseball cap. 9000 represents the total amount of money the school band wants to raise.

**b.**




The $x$-intercept shows that the band can sell 360 sweatshirts and 0 baseball caps and raise \$9000. The $y$-intercept shows that the band can sell 0 sweatshirts and 900 baseball caps and raise \$9000.

**8. a.** $4x + 6y = 96$; no; The coaches send members to both competitions, the intercepts represent if the coaches did not send members to one of the competitions.

**b.** *Sample answer:* 12 teams to Competition A and 8 teams to Competition B

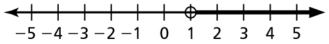
### 3.5 Review & Refresh

**1. a.** \$433.80 **b.** 24 mo

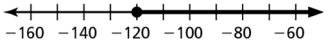
**2.** $x$-intercepts: 0, −4, $y$-intercept: 0

**3.** linear; It can be rewritten as $y = 8 - 3x$, which is a linear equation.

**4.** $b > 1$;



**5.** $c \geq -120$;



**6.** −4, 16 **7.** $h = 6$ **8.** $k = -6$

**9.** $n = -1, n = 2$ **10.** 24 regular cards

**11.** $x = -25$ **12.** 18, −4

### 3.6 Extra Practice

**1.** undefined **2.** positive; 2

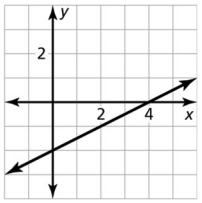
**3.** 0 **4.** −4

**5.** slope: $-\frac{3}{2}$, $y$-intercept: 6

**6.** slope: $-\frac{3}{4}$, $y$-intercept: 2

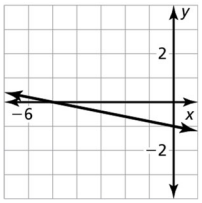
**7.** slope: 5, $y$-intercept: 0

**8.**



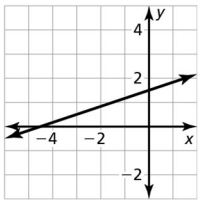
$x$-intercept: 4

**9.**



$x$-intercept: −5

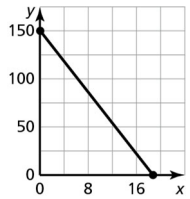
**10.**



$x$-intercept: −4.5

# Answers

**11. a.**




domain: $0 \leq x \leq 18.75$; range: $0 \leq y \leq 150$

**b.** $-8x$ represents the distance the rescuer descends after $x$ seconds at a rate of 8 ft/sec. 150 represents the initial height of the rescuer. The $x$-intercept shows that it takes 18.75 seconds for the rescuer to reach the ground.

**12.** $k = -\frac{1}{2}$

### 3.6 Review & Refresh

**1.** $A'(-4, 2)$, $B'(-3, 4)$, $C'(0, 4)$, $D'(1, 2)$

**2.** $A'(-6, 6)$, $B'(-3, 12)$, $C'(6, 12)$, $D'(9, 6)$

**3.** $A'(-2, -2)$, $B'(-1, -4)$, $C'(2, -4)$, $D'(3, -2)$

**4.** $x = -21.6$

**5.** all real numbers

**6.** $a = 2$

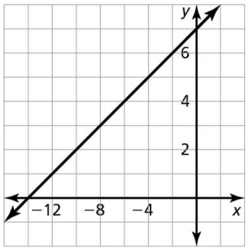
**7.** $q = 11$

**8.** slope: $-3$; $y$-intercept: 2

**9.** $r \geq 4$

**10. a.** $(-2, 9)$ **b.** $(5, 5.4)$

**11.**

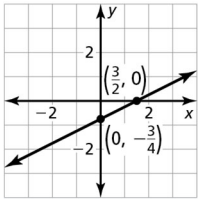



$x$-intercept: $-14$

**12.** linear; The rate of change is constant.

**13.** nonlinear; The equation cannot be rewritten as $y = mx + b$.

**14.**




### 3.7 Extra Practice

**1.** The graph of $g$ is a vertical translation 2 units down of the graph of $f$.

**2.** The graph of $g$ is a horizontal translation 3 units right of the graph of $f$.

**3.** The graph of $g$ is a horizontal translation 4 units left of the graph of $f$.

**4.** The graph of $g$ is a vertical translation $\frac{1}{2}$ unit up of the graph of $f$.

**5.** The graph of $h$ is a reflection in the $y$-axis of the graph of $f$.

**6.** The graph of $h$ is a reflection in the $x$-axis of the graph of $f$.

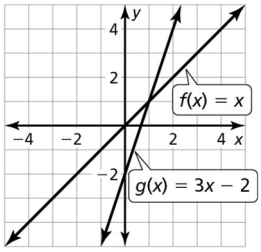
**7.** The graph of $r$ is a vertical stretch of the graph of $f$ by a factor of 2.

**8.** The graph of $r$ is a horizontal stretch of the graph of $f$ by a factor of 2.

**9.** The graph of $h$ is a horizontal shrink of the graph of $f$ by a factor of $\frac{1}{4}$.

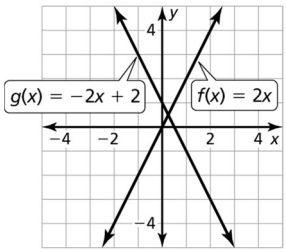
**10.** The graph of $h$ is a vertical shrink of the graph of $f$ by a factor of $\frac{2}{3}$.

**11.**




The graph of $g$ is a vertical stretch by a factor of 3 and a vertical translation 2 units down of the graph of $f$.

**12.**




The graph of $g$ is a reflection in the $x$-axis and a vertical translation 1 unit up of the graph of $f$.

**13.** $r = 2$

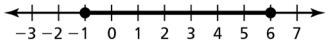
**14.** $r = \frac{1}{2}$

# Answers

### 3.7 Review & Refresh

**1.** dilate the dark triangle by a scale factor of 2, then reflect the triangle in the $x$-axis, then translate the triangle down 2 units

**2.** $-1 \leq a \leq 6$;




**3.** no solution

**4.** $\leq$

**5.** $-5\frac{3}{4}; -3\frac{1}{2}$

**6.** $b = 30$

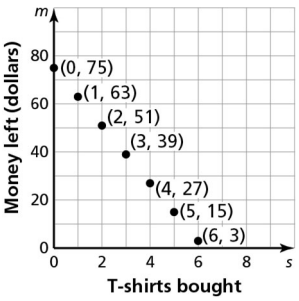
**7.** $c = 48$

**8.** $q = 2$

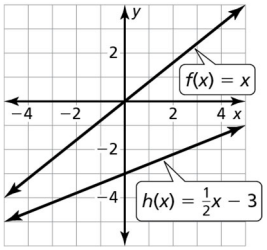
**9.** $r = 0, r = \frac{10}{3}$

**10. a.** 0, 1, 2, 3, 4, 5, 6; discrete; The number of T-shirts must be a whole number.

**b.**




**11.**

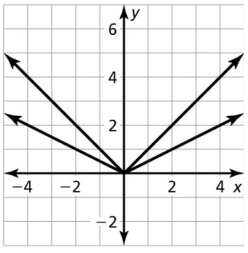



The graph of $h$ is a vertical shrink by a factor of $\frac{1}{2}$ and a vertical translation 3 units down of the graph of $f$.

**12.** $A = 2, B = -1$

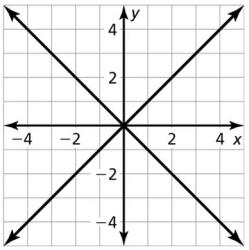
### 3.8 Extra Practice

**1.**



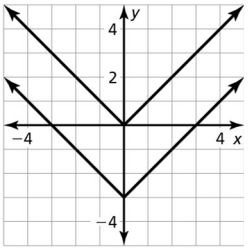

The graph of $t$ is a vertical shrink of the graph of $f$ by a factor of $\frac{1}{2}$. The domain is all real numbers. The range is $y \geq 0$.

**2.**



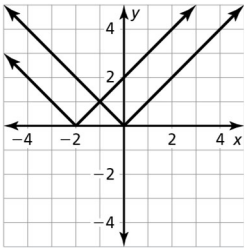

The graph of $u$ is a reflection in the $x$-axis of the graph of $f$. The domain is all real numbers. The range is $y \leq 0$.

**3.**



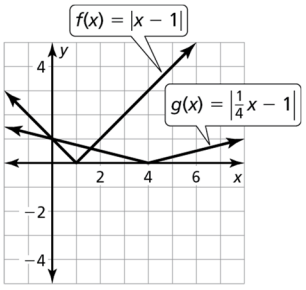

The graph of $p$ is a vertical translation 3 units down of the graph of $f$. The domain is all real numbers. The range is $y \geq -3$.

**4.**




The graph of $r$ is a horizontal translation 2 units left of the graph of $f$. The domain is all real numbers. The range is $y \geq 0$.

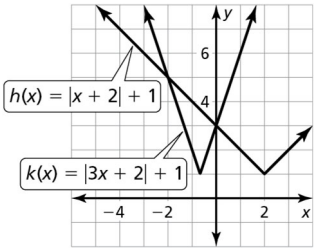
**5.**




The graph of $g$ is a horizontal stretch of the graph of $f$ by a factor of 4.

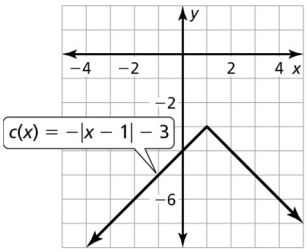
# Answers

**6.**



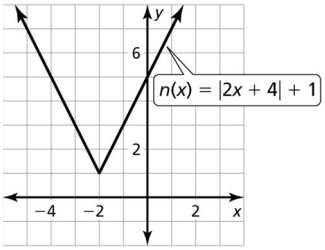

The graph of $k$ is a horizontal shrink of the graph of $h$ by a factor of $\frac{1}{3}$.

**7.**




The graph of $c$ is a horizontal translation 1 unit right, a reflection in the $x$-axis, and a vertical translation 3 units down of the graph of $f$.

**8.**



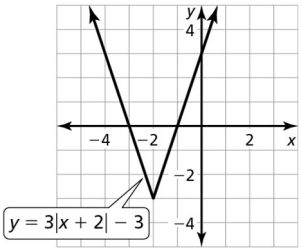

The graph of $n$ is a horizontal translation 4 units left, then a horizontal shrink by a factor of $\frac{1}{2}$, then a vertical translation 1 unit up of the graph of $f$.

**9. a.** $A'\left(-4, \frac{1}{2}\right)$, $B'(-1, -4)$, $C'(1, -1)$

**b.** $A'\left(-1, -\frac{1}{2}\right)$, $B'(4, 4)$, $C'(6, 1)$

**c.** $A'(1, 1)$, $B'(4, -8)$, $C'(6, -2)$

**10.**




$f(x) = 3|x + 2| - 3$

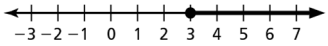
### *3.8 Review & Refresh*

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

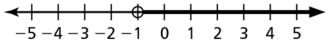
**2. a.** There are 30 customers in the store $n$ hours after 8 A.M.

**b.** There are fewer customers in the store at 12:30 P.M. than at 11 A.M.

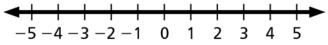
**3.** $a \geq 3$;




**4.** $p > -1$;




**5.** all real numbers;

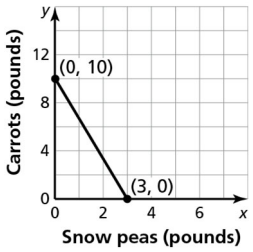



**6.** The graph of $g$ is a horizontal translation 3 units right of the graph of $f$.

**7.** The graph of $g$ is a reflection in the $x$-axis of the graph of $f$.

**8. a.** $5x$ represents the total amount of money you spend on snow peas at \$5/lb; $1.5y$ represents the total amount of money you spend on carrots at \$1.50/lb; 15 represents the total amount of money you have to spend

**b.**




The $y$-intercept shows you can buy 10 pounds of carrots when you do not buy any snow peas. The $x$-intercept shows you can buy 3 pounds of snow peas when you do not buy any carrots.

**9.** $x = -5, x = \frac{7}{3}$ **10.** $x = -1, x = 3$

**11.** 938.78 m/min

**12.** The graph of $g$ is a vertical translation 3 units down and a horizontal translation 2 units left of the graph of $f$; $h = -2, k = -3$

### *Chapter 3 Test Prep*

**1.** A **2.** B **3.** D

**4.** 4.25 pints **5.** $x = -5$

# Answers

**6.** A **7.** C, D **8.** A, C, E, F

**9.** C **10.** $x < 1200$ **11.** $x = 3$

**12.** $c = 7$ **13.** D

**14.** $g(x) = f(4x)$ **15.** D

**16.** A, B, C **17.** B **18.** A

## Chapter 4

### *4.1 Extra Practice*

**1.** $y = 9$ **2.** $y = -4.5x - 3.5$

**3.** $y = \frac{1}{6}x + 4$ **4.** $y = -3x + 5$

**5.** $y = 2x$ **6.** $y = -\frac{3}{4}x + 3$

**7.** $y = 4x - 7$ **8.** $y = \frac{1}{4}x + 2$

**9.** $y = 0.2x - 0.6$ **10.** $f(x) = x + 10$

**11.** $f(x) = 2x + 2$ **12.** $f(x) = -\frac{1}{5}x + 5$

**13.** $f(x) = -3x - 4$ **14.** 15,720

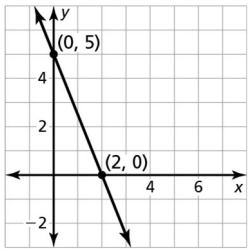
**15.** $y = -\frac{1}{3}x + 2$

### *4.1 Review & Refresh*

**1.** no solution **2.** all real numbers

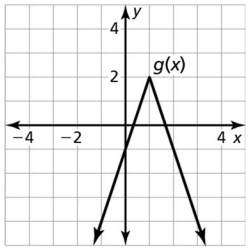
**3.** $y = \frac{1}{2}x - 1$

**4.**




**5. a.** The graph of $g$ is a reflection in the $x$-axis, a vertical stretch by a factor of 3, a horizontal translation 1 unit right, and a vertical translation 2 units up of the graph of $f$.

**b.**




**6.** 7

**7.** slope: 0; $y$-intercept: 3.25

**8.** slope: –4; $y$-intercept: 3

**9.** not a solution

**10.** $a = 3$ represents the factor that your weekly earnings increased by; $k = 450$ represents a \$450 one-time bonus

### *4.2 Extra Practice*

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

**3.** $y - 2 = -0.5(x - 1)$ **4.** $y = -x + 3$

**5.** $y = \frac{1}{2}x - 2$ **6.** $y = 3x - 6$

**7.** $f(x) = 5x + 14$ **8.** $f(x) = -6x - 4$

**9.** $f(x) = -0.5x + 1$ **10.** $f(x) = \frac{1}{4}x + \frac{9}{4}$

**11.** yes; The data have a constant rate of change; $y = 25x - 35$

**12.** no; The data do not have a constant rate of change.

**13. a.** $y = 8.5x + 2.5$ **b.** \$172.50

### *4.2 Review & Refresh*

**1.** $\frac{1}{7}$ **2.** $-\frac{1}{2}$ **3.** $-\frac{5}{3}$ **4.** $\frac{4}{7}$

**5.** $y - 2 = \frac{3}{4}(x + 3)$

**6.** The graph of $p$ is a horizontal translation 5 units left of the graph of $f(x) = |x|$. The graph of $q$ is a vertical translation 5 units up of the graph of $f(x) = |x|$.

**7.** discrete; The number of tickets must be a whole number.

**8.** $y = \frac{1}{3}x - 3$

**9.** The graph of $T$ is a vertical translation 12 units up of the graph of $C$.

**10.** $r \leq 2$ *or* $r > 3$