7–1

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Study Guide

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Slope

Slope is the ratio of the rise, or the vertical change, to the run, or the horizontal change. A greater ratio indicates a steeper slope. A typical ski mountain has a slope of about $\frac{1}{1}$, while a car windshield may have a slope of 3.

For any two points (x_1, y_1) and (x_2, y_2),

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

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

Examples: Find the slope of the line containing each pair of points.

a. $(4, -2)$ and $(-3, 7)$

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

$m = \frac{7 - (-2)}{-3 - 4}$

$m = \frac{-9}{7}$

b. $(-3, 6)$ and $(-3, -1)$

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

$m = \frac{-1 - 6}{-3 - (-3)}$

$m = \frac{-7}{0}$

Since you cannot divide by 0, the slope is *undefined*.

c. $(4, 5)$ and $(-2, 5)$

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

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

$m = \frac{0}{-6}$ or 0

Determine the slope of the line passing through the points whose coordinates are listed.

1. $(-2, 1)$ and $(4, 2)$
2. $(0, 3)$ and $(4, 1)$
3. $(-3, -5)$, $(5, 7)$
4. $(4, 3)$ and $(4, -1)$
5. $(8, -2)$ and $(-3, -2)$
6. $(5, 1)$ and $(-1, -5)$
7. $(7, -1)$ and $(6, 6)$
8. $(5, -2)$ and $(-5, 2)$
9. $(7, -7)$ and $(-6, 6)$
10. $(4, -4)$ and $(0, 3)$
11. $(-2, 4)$ and $(-2, 9)$
12. $(0, 8)$ and $(-3, 8)$

7–1

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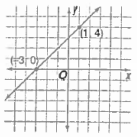
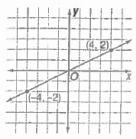
Practice

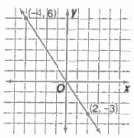
Student Edition Pages 284–289

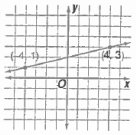
Slope

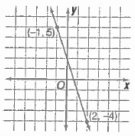
Determine the slope of each line.

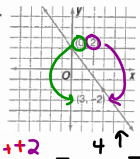
1. 

2. 

3. 

4. 

5. 

6. 

Determine the slope of the line passing through the points whose coordinates are listed in each table.

7.

x	y
−1	−3
0	0
1	3
2	6

8.

x	y
−2	5
2	4
6	3
10	2

9.

x	y
−3	4
−1	5
1	6
3	7

Determine the slope of each line.

10. the line through points at (3, 4) and (4, 6)
11. the line through points at $(-3, -2)$ and $(-2, -5)$
12. the line through points at (2, 3) and $(-5, 1)$
13. the line through points at $(4, -1)$ and (9, 6)
14. the line through points at $(-4, 4)$ and $(-9, -8)$
15. the line through points at $(-6, 2)$ and $(7, -3)$

7-2

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Study Guide

Student Edition Pages 290–295

Writing Equations in Point-Slope Form

You can write the equation of a line if you know its slope and the coordinates of one point or if you know the coordinates of two points on the line. Use the point-slope form.

Point-Slope Form

For a nonvertical line through the point at (x_1, y_1) with slope m, the point-slope form of a linear equation is $y - y_1 = m(x - x_1)$.

Examples: Write the point-slope form of an equation for each line.

a. the line passing through the point at $(-4, 2)$ and having a slope of $\frac{2}{3}$

$y - y_1 = m(x - x_1)$

$y - 2 = \frac{2}{3}(x - (-4))$

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

b. the line passing through points at $(4, -4)$ and $(-3, 1)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ *Find m.*

$m = \frac{1 - (-4)}{-3 - 4}$ or $-\frac{5}{7}$

$y - (-4) = -\frac{5}{7}(x - 4)$ *Substitute m.*

$y + 4 = -\frac{5}{7}(x - 4)$

Write the point-slope form of an equation for each line, given either the coordinates of a point and the slope or the coordinates of two points.

$y - y_1 = m(x - x_1)$

1. $(-2, -1)$, $m = 2$ → $y - -1 = 2(x - -2)$, $y + 1 = 2(x + 2)$

2. $(4, -1)$, $m = -\frac{1}{2}$

3. $(-3, 5)$, $m = \frac{3}{2}$ → $y - 5 = \frac{3}{2}(x - -3)$, $y + 5 = \frac{3}{2}(x + 3)$

4. $(4, 3)$, $m = \frac{1}{5}$

5. $(8, -2)$, $m = 0$

6. $(5, 1)$, $m = -\frac{2}{3}$

7. $(7, -1)$ and $(6, 6)$

8. $(5, -2)$ and $(-5, 2)$ ✓ → $m = \frac{2 + +2}{-5 + 5} = \frac{4}{-10} = -\frac{2}{5}$, $y + -2 = \frac{-2}{5}(x + +5)$

9. $(7, -7)$ and $(-6, 6)$

10. $(4, -4)$ and $(0, 3)$

11. $(-2, -4)$ and $(-12, 9)$

12. $(0, 8)$ and $(-3, 8)$

7-2

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Practice

Student Edition Pages 290–295

Writing Equations in Point-Slope Form

Write the point-slope form of an equation for each line passing through the given point and having the given slope.

1. $(4, 7)$, $m = 3$

2. $(-2, 3)$, $m = 5$

3. $(6, -1)$, $m = -2$

4. $(-5, -2)$, $m = 0$

5. $(-4, -6)$, $m = \frac{2}{3}$

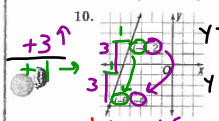
6. $(-8, 3)$, $m = -\frac{3}{5}$

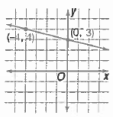
7. $(7, -9)$, $m = 4$

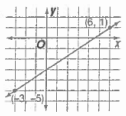
8. $(-6, 3)$, $m = -\frac{1}{2}$

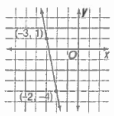
9. $(-2, -5)$, $m = 8$ → $y - -5 = 8(x - -2)$, $y + 5 = 8(x + 2)$

Write the point-slope form of an equation for each line.

10.  → $y + +4 = \frac{3}{1}(x + +6)$ or $y + -2 = \frac{3}{1}(x + +4)$; $m = \frac{2 + +4}{-4 + +6} = \frac{+6}{+2} = \frac{+3}{1} = \frac{3}{1}$

11. 

12. 

13. 

14. the line through points at $(-2, -2)$ and $(-1, -6)$

15. the line through points at $(-7, -3)$ and $(5, -1)$

7–3

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Study Guide

Student Edition Pages 296–301

Writing Equations in Slope-Intercept Form

Given the slope m and the y-intercept b of a line, the slope-intercept form of an equation of the line is $y = mx + b$. Sometimes it is more convenient to express the equation of a line in slope-intercept form instead of point-slope form. This form is especially useful when graphing lines.

Examples: Write the point-intercept form of an equation for each line.

a. the line with $m = -\frac{2}{3}$ and $b = 4$

$y = mx + b$

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

b. the line passing through points at $(4, -2)$ and $(6, 2)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$ *Find m.*

$m = \frac{2 - (-2)}{6 - 4} = \frac{4}{2} = 2$

$y - 2 = 2(x - 6)$

$y - 2 = 2x - 12$ *Multiply.*

$y - 2 + 2 = 2x - 12 + 2$ *Add 2 to each side.*

$y = 2x - 10$ *Simplify.*

Write the slope-intercept form of an equation for each line, given either the slope and the y-intercept or the coordinates of two points.

1. $m = 2$, $b = -3$ $y = mx + b$, $y = 2x + -3$

2. $m = \frac{1}{2}$, $b = 5$ $y = mx + b$, $y = \frac{1}{2}x + 5$

3. $m = \frac{7}{4}$, $(0, -3)$ $y = mx + b$, $y = \frac{7}{4}x + -3$

4. $m = -\frac{1}{5}$, $b = 0$

5. $m = \frac{1}{6}$, $b = -1$

6. $m = 0$, $b = 5$

7. $(5, -3)$ and $(-4, -3)$ $m = \frac{-3+3}{5+4} = \frac{0}{+9} = 0$, $y = 0x + -3$, $(0, -3)$

8. $(-5, 1)$ and $(-1, 5)$

9. $(0, -1)$ and $(6, 5)$

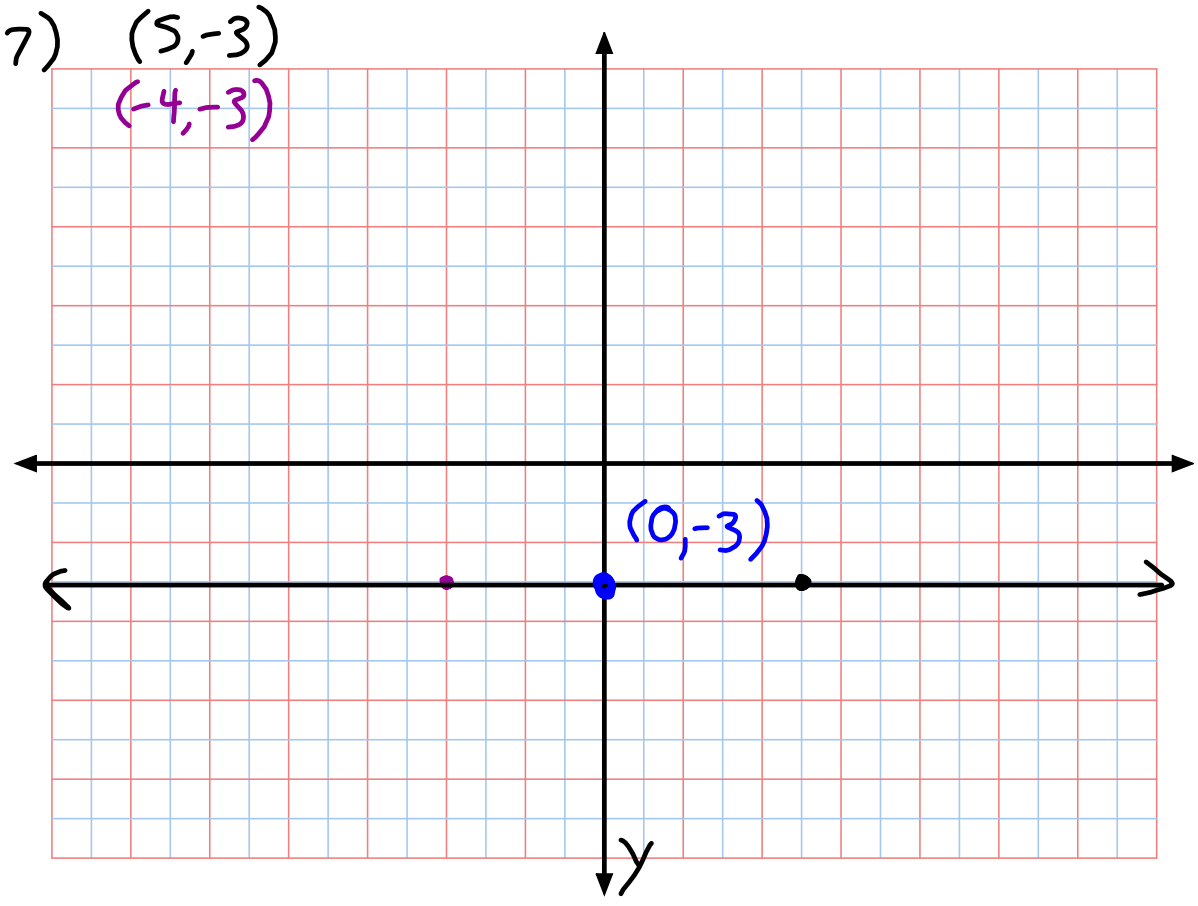
10. $(-2, -2)$ and $(-4, 2)$

11. $(-2, -4)$ and $(-12, 6)$ see notes

12. $(0, 8)$ and $(-3, 4)$

13. $(0, 8)$ and $(-2, 7)$

14. $(0, -3)$ and $(6, 5)$ see notes



11) (-2, -4)
(-12, 6)

$y = mx + b$

$m = \frac{-4+6}{-2+12} = \frac{-10 \div 10}{10 \div 10} = \frac{-1}{1} = -1$

$y = -1x + b$

$-4 = -1(-2) + b$

$-4 = 2 + b$

$+-2 = +-2$

$-6 = b$

$y = -1x + -6$

$\frac{-1 \times 2}{1 \times 2} = \frac{-2}{2}$

(-2, 4)

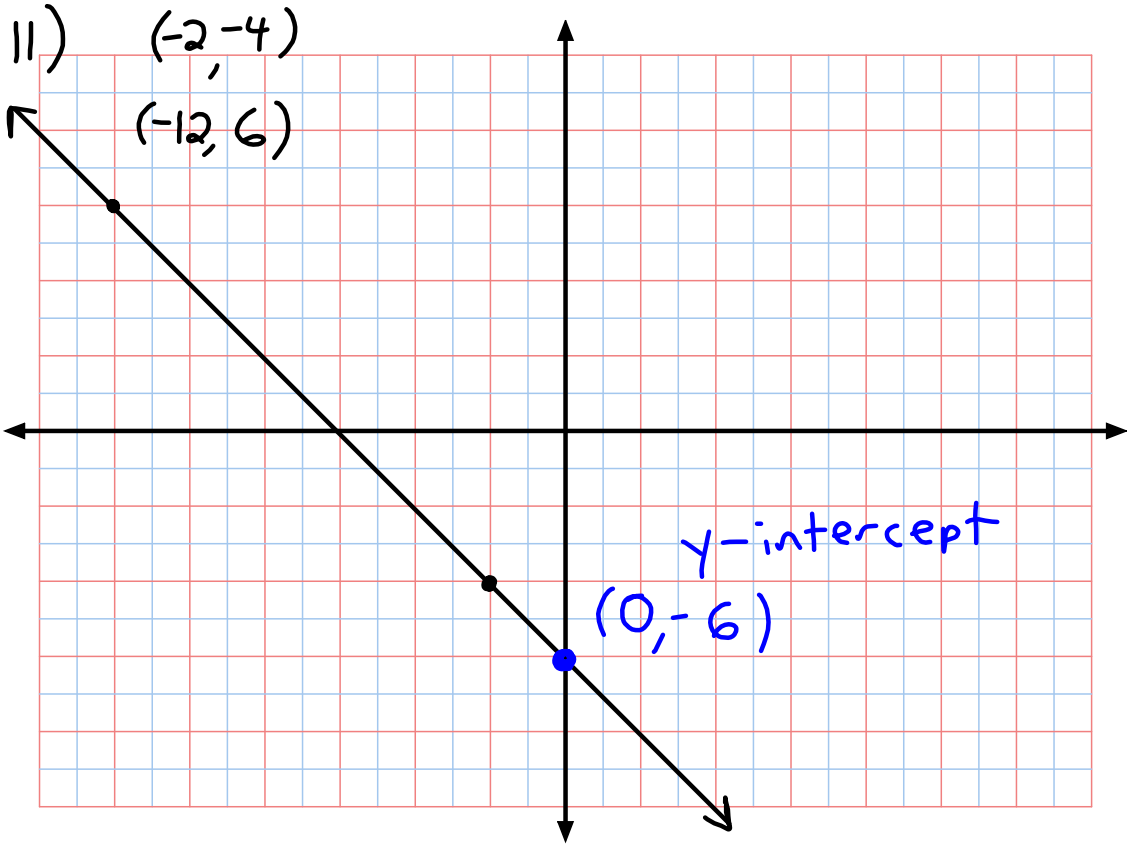
(0, -6)

$6 = -1(-12) + b$

$6 = 12 + b$

$+12 = -12$

$-6 = b$



14) $y = mx + b \rightarrow (0, b)$

$(0, -3)$

$(6, 5)$

$y = x + -3$

$m = \frac{5+3}{6+0} = \frac{+8 \div 2}{6 \div 2} = \frac{4}{3}$

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

7–3

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Practice

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Writing Equations in Slope-Intercept Form

Write an equation in slope-intercept form of the line with each slope and y-intercept.

(0,5) 1. $m = -3, b = 5$ $y = -3x + 5$

2. $m = 6, b = 2$ (0,2) $y = 6x + 2$

3. $m = 4, b = -1$

4. $m = 0, b = 4$

5. $m = \frac{2}{5}, b = -7$ $y = \frac{2}{5}x + -7$

6. $m = -\frac{3}{4}, b = 8$

7. $m = -\frac{4}{3}, b = -2$

8. $m = -5, b = 6$

9. $m = \frac{1}{2}, b = -9$

Write an equation in slope-intercept form of the line having the given slope and passing through the given point.

10. $m = 3$, (4, 2) see notes

11. $m = -2$, $(-1, 3)$ $y = -2x + b$ see notes

12. $m = 4$, (0, −7)

13. $m = -\frac{3}{5}$, (−5, −3)

14. $m = \frac{4}{4}$, (−8, 6)

15. $m = -\frac{2}{3}$, (9, −4)

16. $m = \frac{5}{6}$, (6, −6) see notes

17. $m = 0$, (−8, −7)

18. $m = -\frac{3}{2}$, (−8, 9)

Write an equation in slope-intercept form of the line passing through each pair of points.

19. (1, 3) and (−3, −5)

20. (0, 5) and (3, −4)

21. (2, 1) and (3, 6)

22. (−3, 0) and (6, −6) see notes

23. (4, 5) and (−5, 5)

24. (0, 6) and (−4, 3)

25. (−3, 2) and (3, −6)

26. (−7, −6) and (−5, −3)

27. (6, −4) and (0, 2)

10) $m = 3$ $y = mx + b$ $(0, b)$

$(4, 2)$

$y = 3x + b$

$(2) = 3(4) + b$

$+2 = 12 + b$

$+-12 = +-12$

$-10 = b$

$y = 3x + -10$ y-int: $(0, -10)$

11) $y = mx + b$

$m = -2$ $(-1, 3)$

$y = mx + b$

$3 = -2(-1) + b$

$+3 = +2 + b$

$+-2 = +-2$

$+1 = b$

$b = +1$

y-int: $(0, 1)$

$y = -2x + 1$

$(0, 1)$

y-int

16) $y = mx + b$

$m = \frac{5}{6}$ $(\overset{x}{6}, \overset{y}{-6})$

$y = \frac{5}{6}x + b$

$(-6) = \frac{5}{6}(6) + b$

$\frac{5}{1} \cdot \frac{1}{1}$

$-6 = 5 + b$

$+-5 = +-5$

$-11 = b$

$y = mx + b$

$y = \frac{5}{6}x + -11$

y-int: $(0, -11)$

22) $(-3, 0)$ → x-int

$(6, -6)$

$m = \frac{0 + +6}{-3 + -6} = \frac{+6 \div 3}{-9 \div 3} = \frac{2}{-3}$ ↑ ←

or $\frac{-2}{3}$ ↓ →

$y = mx + b$

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

$0 = -\frac{2}{3}(-3) + b$

$0 = +2 + b$

$+-2 = +-2$

$-2 = b$

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

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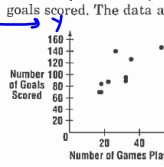
Study Guide

Student Edition Pages 302–307

Scatter Plots

The scatter plot below is a graph of the number of games played in the highest-scoring World Cup finals compared to the number of goals scored. The data are listed in the table.

Year	Number of Games Played	Number of Goals Scored
1954	26	140
1938	18	84
1934	17	70
1950	22	88
1930	18	70
1958	35	126
1970	32	95
1982	52	146
1962	32	89
1966	32	89



dependent variable → y

y is a function of x (y depends on x)

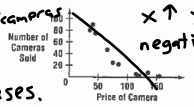
x → independent variable

You can use the scatter plot to draw conclusions about the data. The data points fall roughly along a line with a positive slope. Therefore, we say there is a ~~positive relationship~~ between the number of games played and the number of goals scored. A line with a negative slope would indicate a ~~negative relationship~~, and no line would indicate no relationship between the variables. A valid conclusion from this scatter plot is that as the number of games played increases, more goals are scored.

x↑ y↑
x↓ y↓
x↑ y↓
x↓ y↑

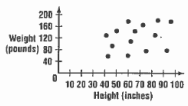
Determine whether each scatter plot has a positive *relationship,* negative *relationship, or* no *relationship. If there is a relationship, describe it.*

1. As price of camera increases the number sold decreases.

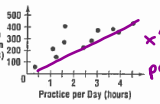


x↑ y↓ negative

2.

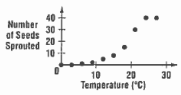


3. As we practice more, we are able to swim a longer distance.



x↑ y↑ positive

4.



7-4

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Practice

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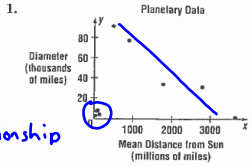
Scatter Plots

Determine whether each scatter plot has a positive *relationship,* negative *relationship, or* no *relationship. If there is a relationship, describe it.*

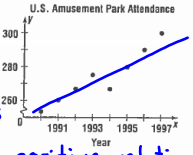
1. Planetary Data



no relationship

2. Marriage Rates

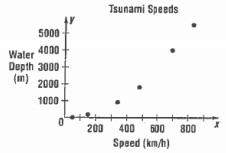
3. U.S. Amusement Park Attendance



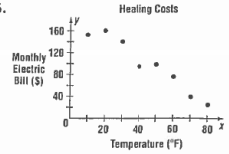
Attendance at amusement parks increases over time.

positive relationship

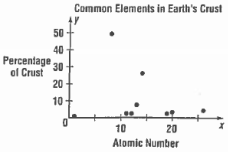
4. Tsunami Speeds



5. Heating Costs



6. Common Elements in Earth's Crust



no relationship

7-5

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Study Guide

Student Edition Pages 310–315

Graphing Linear Equations

You may use the slope-intercept form to graph linear equations, as shown in the example below.

Example: Graph $2x + 3y = 6$.

Rewrite in slope-intercept form.

$2x + 3y = 6$

$2x + 3y - 2x = 6 - 2x$ *Subtract 2x from each side.*

$3y = -2x + 6$

$\frac{3y}{3} = \frac{-2x}{3} + \frac{6}{3}$ *Divide each side by 3.*

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

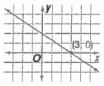
$y = mx + b$

To graph $y = -\frac{2}{3}x + 2$, plot a point at the y-intercept, 2.

Then use the slope, $-\frac{2}{3}$. From (0, 2), go down 2 units.

Then go right 3 units. Graph a point at (3, 0).

Draw the line through the points.



Graph each equation.

1. $y = x - 1$

y-int: (0, -1)

$m = -1 = \frac{1}{-1}$ or $\frac{-1}{1}$

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

y-int: (0, -2)

$m = \frac{4}{3}$ or $\frac{-4}{-3}$

3. $y = \frac{1}{2}x + 4$

4. $y = -3$

5. $2x + 4y = 8$

6. $2x - 3y = 6$

7. $x + 2y = 4$

8. $x - 5y = 5$

$+x \quad = +x$

$-5y = -x + 5$

$\frac{-5y}{-5} = \frac{-x}{-5} + \frac{5}{-5}$

$y = \frac{-1x}{-5} + -1$

$y = \frac{1}{5}x + -1$

y-int: (0, -1)

$m = \frac{1}{5} = \frac{-1}{-5}$

7-5

NAME _____ DATE _____ PERIOD _____

Practice

Student Edition Pages 310–315

Graphing Linear Equations

let y = 0 solve for x

let x = 0 solve for y

Determine the x-intercept and y-intercept of the graph of each equation. Then graph the equation.

1. $x + y = -2$

$x + y = -2$

$x + (0) = -2$

$x = -2$

$(-2, 0)$ x-int

2. $2x + y = 6$

$x + y = -2$

$(0) + y = -2$

$y = -2$

$(0, -2)$ y-int

3. $x - 2y = -4$

4. $2x + 3y = 12$

5. $3x - 3y = 9$

6. $5x + 6y = -30$

see notes

(-6, 0)

(0, -5)

Determine the slope and y-intercept of the graph of each equation. Then graph the equation.

7. $y = -x + 3$

8. $y = 5$

9. $y = 3x - 4$

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

11. $y = -\frac{3}{4}x + 1$

12. $y = \frac{2}{3}x - 6$

c) $5x + 6y = -30$

x-int: let $y = 0$

$5x + 6(0) = -30$

$5x = -30$

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

$x = -6$

x-int: $(-6, 0)$

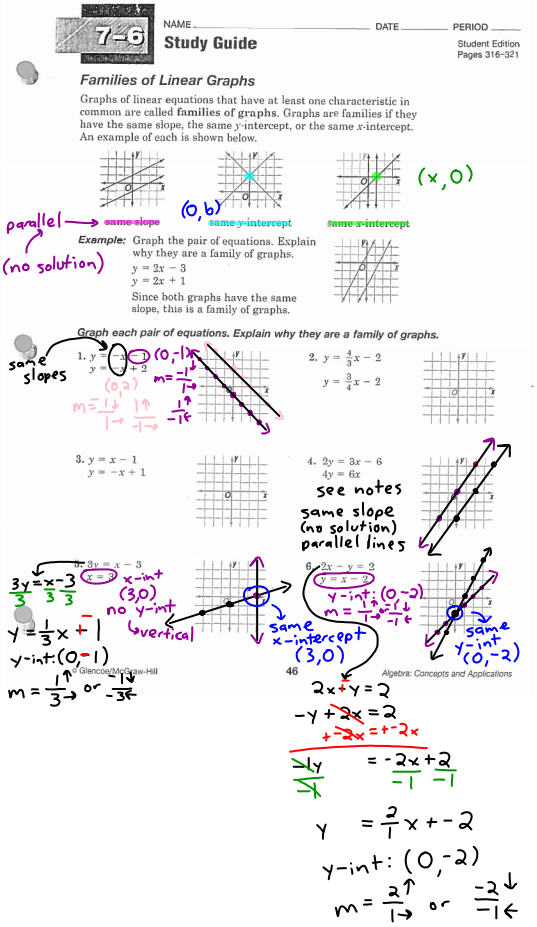
y-int: let $x = 0$

$5(0) + 6y = -30$

$\frac{6y}{6} = \frac{-30}{6}$

$y = -5$

y-int: $(0, -5)$



7–6 Study Guide

NAME _____ DATE _____ PERIOD _____

Student Edition Pages 316–321

Families of Linear Graphs

Graphs of linear equations that have at least one characteristic in common are called **families of graphs**. Graphs are families if they have the same slope, the same y-intercept, or the same x-intercept. An example of each is shown below.

parallel → ~~same slope~~ (no solution)

(0, b) ~~same y-intercept~~

(x, 0) ~~same x-intercept~~

Example: Graph the pair of equations. Explain why they are a family of graphs.

$y = 2x - 3$

$y = 2x + 1$

Since both graphs have the same slope, this is a family of graphs.

Graph each pair of equations. Explain why they are a family of graphs.

1. $y = -x - 1$, $y = -x + 2$ — same slopes; (0, −1), m = −1/1; (0, 2), m = 1/1 = −1/−1

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

3. $y = x - 1$, $y = -x + 1$

4. $2y = 3x - 6$, $4y = 6x$ — see notes; same slope (no solution) parallel lines

5. $3y = x - 3$ ($x = 0$) — x-int (3, 0); no y-int; vertical; same x-intercept (3, 0); $\frac{3y}{3} = \frac{x}{3} - \frac{3}{3}$; $y = \frac{1}{3}x + (-1)$; y-int: (0, −1); m = 1/3 → or −1/−3 ←

6. $2x - y = 2$ ($y = x - 2$) — y-int: (0, −2); m = 1/1 → = −1/−1 ←; same y-int (0, −2)

$2x + y = 2$

$-y + 2x = 2$

$+ -2x = +-2x$

$\frac{-1y}{-1} = \frac{-2x}{-1} + \frac{2}{-1}$

$y = \frac{2}{1}x + -2$

y-int: $(0, -2)$

$m = \frac{2}{1}$ ↑ → or $\frac{-2}{-1}$ ↓ ←

4) $\frac{2y}{2} = \frac{3x}{2} + \frac{-6}{2}$ $y=mx+b$

$y = \frac{3}{2}x + -3$ y-int: $(0,-3)$

$\frac{4y}{4} = \frac{6x}{4}$

$y = \frac{6\div2}{4\div2}x + 0$ y-int: $(0,0)$

$y = \frac{3}{2}x + 0$

7–6 NAME _____ DATE _____ PERIOD _____

Practice

Student Edition Pages 316–321

Families of Linear Graphs

Graph each pair of equations. Describe any similarities or differences and explain why they are a family of graphs.

1. $y = 2x + 3$
   $y = 2x - 3$

2. $y = 4x + 5$
   $y = -3x + 5$

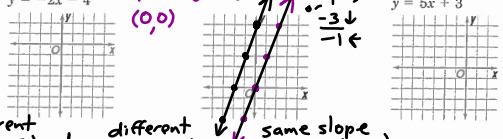
3. $y = \frac{1}{3}x + 2$
   $y = \frac{1}{3}x + 4$

Compare and contrast the graphs of each pair of equations. Verify by graphing the equations.

4. $y = -\frac{1}{2}x - 4$
   $y = -2x - 4$

5. $3x + 6 = y$
   $3x = y$

6. $y = \frac{5}{6}x + 3$
   $y = 5x + 3$



different x-int (0,0) and (-2,0)

different y-int (0,6) and (0,0)

same slope (no solution) parallel lines

Change $y = -x + 2$ so that the graph of the new equation fits each description.

7. same slope, shifted down 2 units — see notes (all points)

8. same y-intercept, steeper negative slope — see notes

9. positive slope, same y-intercept

10. same y-intercept, less steep negative slope

11. same slope, shifted up 4 units

12. same slope, shifted down 6 units

7) $y = -x + 2$ $(0,2)$

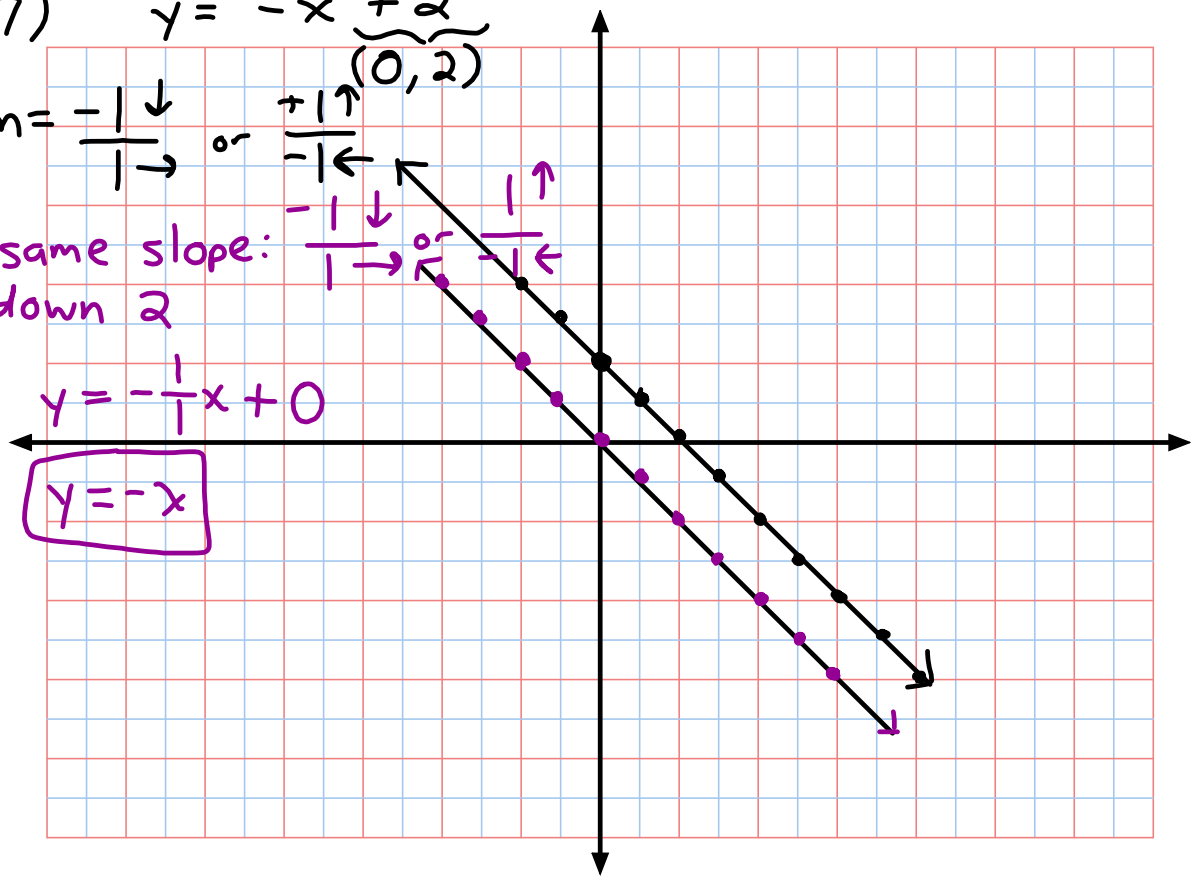
$m = \frac{-1\downarrow}{1\rightarrow}$ or $\frac{+1\uparrow}{-1\leftarrow}$

same slope: $\frac{-1\downarrow}{1\rightarrow}$ or $\frac{1\uparrow}{-1\leftarrow}$

down 2

$y = -\frac{1}{1}x + 0$

$y = -x$



8) $y = -x + 2$ $(0,2)$

$m = \frac{-1\downarrow}{1\rightarrow}$ or $\frac{+1\uparrow}{-1\leftarrow}$

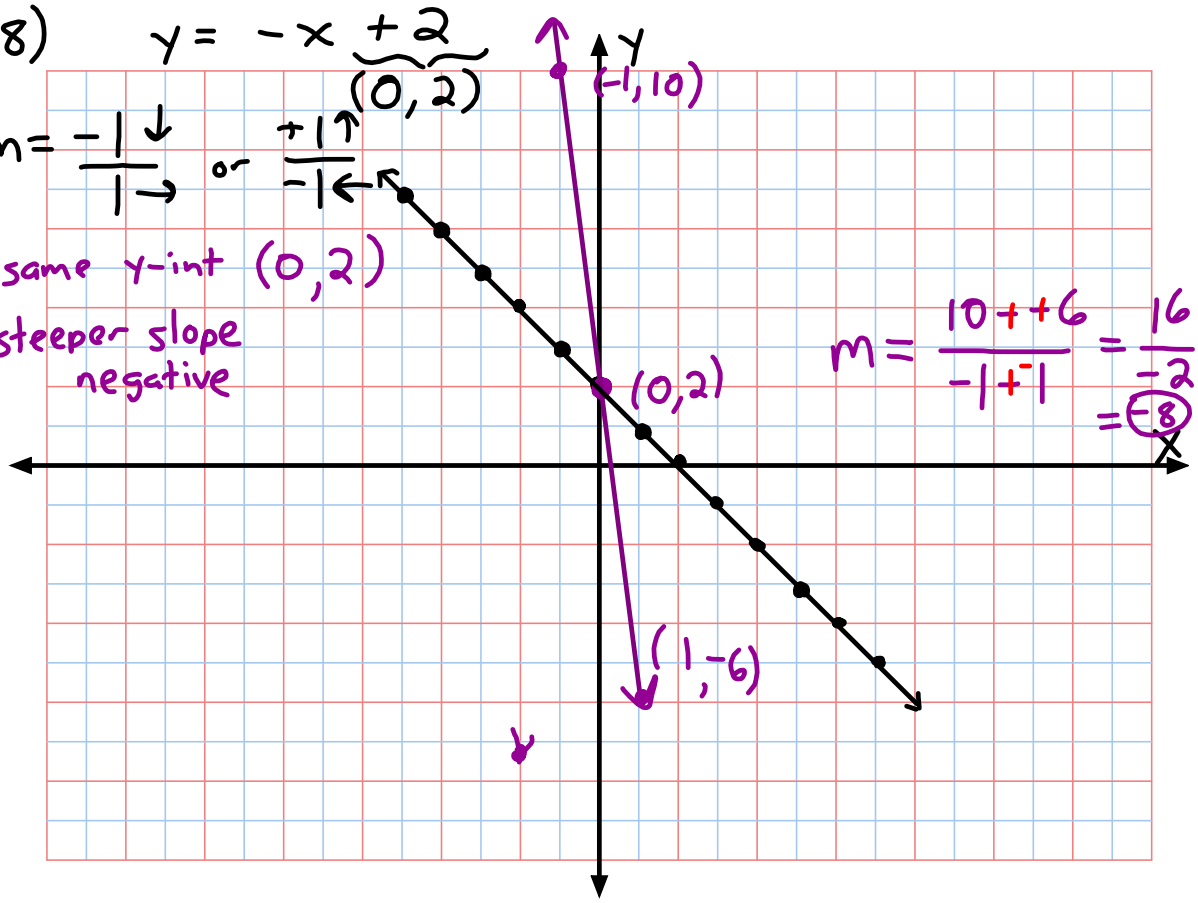
same y-int $(0,2)$

steeper slope

negative

$m = \frac{10 + +6}{-1 + -1} = \frac{16}{-2} = -8$

$(-1,10)$ $(0,2)$ $(1,-6)$



7–7

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Study Guide

Student Edition Pages 322–327

Parallel and Perpendicular Lines

Lines that have the same slope are **parallel**. The graphs of the equations of two lines are a family of graphs because they have the same slope. For example, the graphs of $y = 2x$ and $y = 2x - 3$ are parallel because their corresponding equations have the same slope, 2.

Lines whose slopes are negative reciprocals are **perpendicular**. That is, the product of the slopes is -1. For example, the graphs of $y = 2x$ and $y = -\frac{1}{2}x - 1$ are perpendicular because the product of the slopes, 2 and $-\frac{1}{2}$, is -1.

Parallel Lines	same slope, different y-intercept	$y = \frac{3}{4}x + 2$ $y = \frac{3}{4}x - 5$
Perpendicular Lines	Product of slopes is -1.	$y = -5x + 1$ $y = \frac{1}{5}x - 9$

never will cross

create a right angle (90°)

↳ reciprocal and opposite sign

Determine whether the graphs of the equations are parallel, perpendicular, or neither.

1. $y = -x + 2$
   $y = -x - 3$
   $m = -\frac{1}{1}$
   parallel since slopes are same

2. $y = \frac{3}{4}x + 4$
   $y = \frac{3}{4}x - 2$
   parallel since both slopes are $\frac{3}{4}$

3. $y = -\frac{1}{2}x + 3$
   $y = 2x - 4$
   $m = -\frac{1}{2}$ see graph
   ↳ $m = \frac{+2}{1}$ perpendicular

4. $y = \frac{3}{2}x - 5$
   $y = \frac{3}{2}x + 3$
   neither

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

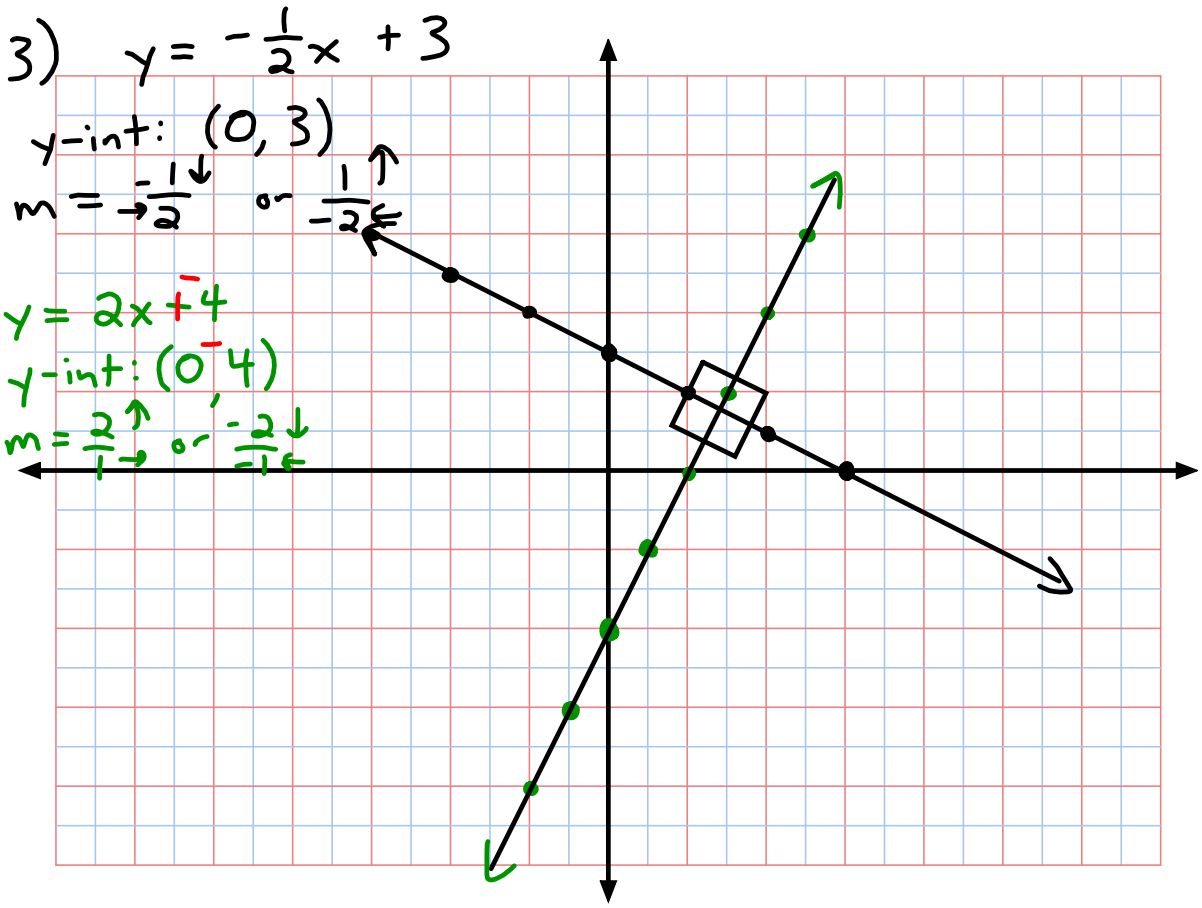
6. $y = 3x + 2$
   $-6x + 2y = -8$

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

8. $y = -2x + 4$
   $x - 2y = 8$

9. $4y - 3x = 1$
   $2y = \frac{3}{2}x - 14$

10. $y = 3 - x$
    $2y - x = 8$



4) $y = \frac{3}{2}x + \overline{5}$

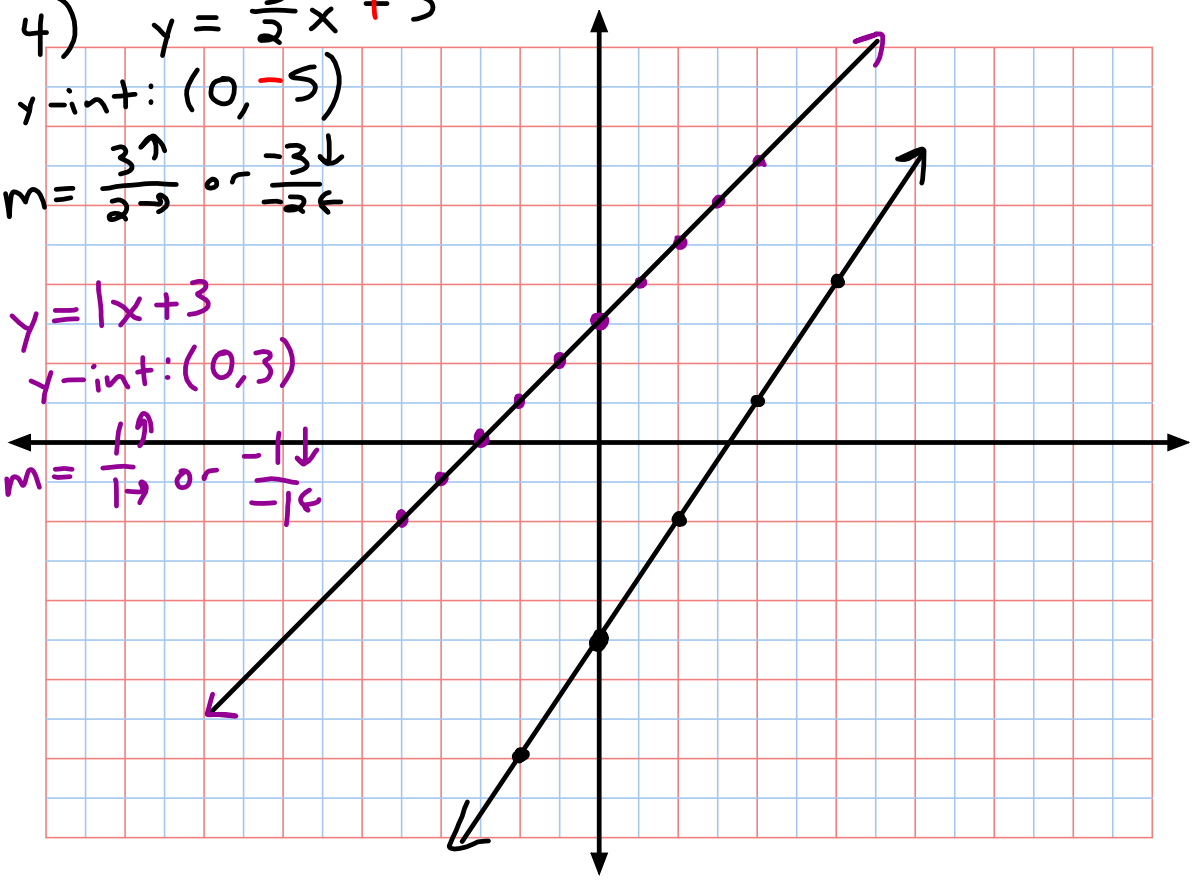
y-int: $(0, -5)$

$m = \frac{3\uparrow}{2\rightarrow}$ or $\frac{-3\downarrow}{-2\leftarrow}$

$y = 1x + 3$

y-int: $(0, 3)$

$m = \frac{1\uparrow}{1\rightarrow}$ or $\frac{-1\downarrow}{-1\leftarrow}$



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7-7 **Practice**

Student Edition
Pages 322–327

Parallel and Perpendicular Lines

Determine whether the graphs of each pair of equations are parallel, perpendicular, *or* neither.

1. $y = 3x + 4$
   $y = 3x + 7$

2. $y = -4x + 1$
   $4y = x + 3$

3. $y = 2x - 5$
   $y = 5x - 5$

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

5. $y = \frac{3}{5}x - 3$
   $5y = 3x - 10$

6. $y = 4$
   $4y = 6$

7. $y = 7x + 2$
   $x + 7y = 8$

8. $y = \frac{5}{6}x - 6$
   $x + 5y = 4$

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

same slope

Write an equation in slope-intercept form of the line that is parallel *to the graph of each equation and passes through the given point.*

$m = 3$

10. $y = 3x + 6$; $(4, 7)$

11. $y = x - 4$; $(-2, 3)$

12. $y = \frac{1}{2}x + 5$; $(4, -5)$

13. $y + \frac{2}{3}x = 3$; $(-6, 1)$

14. $y - \frac{2}{5}x = -5$; $(5, 3)$

15. $y + 2x = 4$; $(-1, 2)$

flip and opposite

Write an equation in slope-intercept form of the line that is perpendicular *to the graph of each equation and passes through the given point.*

16. $y = -5x + 1$; $(2, -1)$

17. $y = 2x - 3$; $(-5, 3)$

18. $4x + 7y = 3$; $(-4, -7)$

19. $3x - 4y = 2$; $(6, 0)$

20. $y = -4x - 2$; $(4, -4)$

21. $6x + 5y = -3$; $(-6, 2)$

10) $y = 3x + 6$ $(4, 7)$

$m = 3$

$y = mx + b$

$7 = 3(4) + b$

$7 = 12 + b$

$+12 = +12$

$-5 = b$

$y = 3x + -5$