2 Chapter Review

Check It Out
Vocabulary Help
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Review Key Vocabulary

linear equation *p. 44*
solution of a linear equation, *p. 44*
slope, *p. 50*
rise, *p. 50*
run, *p. 50*
perpendicular lines, *p. 57*
x-intercept, *p. 60*
y-intercept, *p. 60*
slope-intercept form, *p. 60*
standard form, *p. 66*
point-slope form, *p. 80*

Review Examples and Exercises

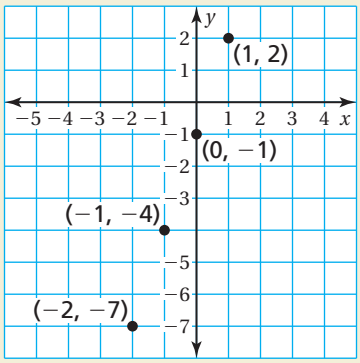
2.1 Graphing Linear Equations *(pp. 42–47)*

Graph $y = 3x - 1$.

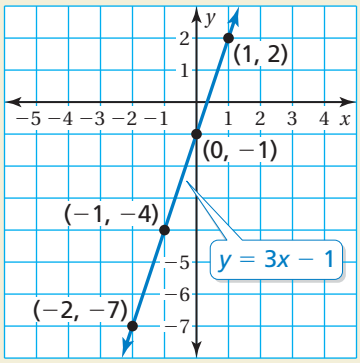
Step 1: Make a table of values.

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

Step 2: Plot the ordered pairs.



Step 3: Draw a line through the points.



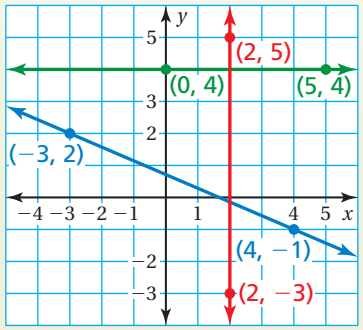
Exercises

Graph the linear equation.

1. $y = \frac{3}{5}x$
2. $y = -2$
3. $y = 9 - x$
4. $y = 1$
5. $y = \frac{2}{3}x + 2$
6. $x = -5$

2.2 Slope of a Line *(pp. 48–57)*

Find the slope of each line in the graph.



Red Line: slope $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - (-3)}{2 - 2} = \frac{8}{0}$

∴ The slope of the red line is undefined.

Blue Line: slope $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 2}{4 - (-3)} = \frac{-3}{7}$, or $-\frac{3}{7}$

Green Line: slope $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 4}{5 - 0} = \frac{0}{5}$, or 0

Exercises

The points in the table lie on a line. How can you find the slope of the line from the table? What is the slope?

7.

x	0	1	2	3
y	−1	0	1	2

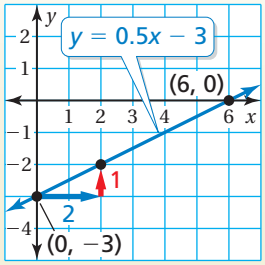
8.

x	−2	0	2	4
y	3	4	5	6

9. Are the lines $x = 2$ and $y = 4$ parallel? Are they perpendicular? Explain.

2.3 Graphing Linear Equations in Slope-Intercept Form *(pp. 58–63)*

Graph $y = 0.5x - 3$. Identify the x-intercept.



Step 1: Find the slope and y-intercept.

$y = 0.5x + (-3)$

slope — y-intercept

Step 2: The y-intercept is −3. So, plot (0, −3).

Step 3: Use the slope to find another point and draw the line.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{1}{2}$$

Plot the point that is 2 units right and 1 unit up from (0, –3). Draw a line through the two points.

∴ The line crosses the x-axis at (6, 0). So, the x-intercept is 6.

Exercises

Graph the linear equation. Identify the x-intercept. Use a graphing calculator to check your answer.

10. $y = 2x - 6$ **11.** $y = -4x + 8$ **12.** $y = -x - 8$

2.4 Graphing Linear Equations in Standard Form *(pp. 64–69)*

Graph $8x + 4y = 16$.

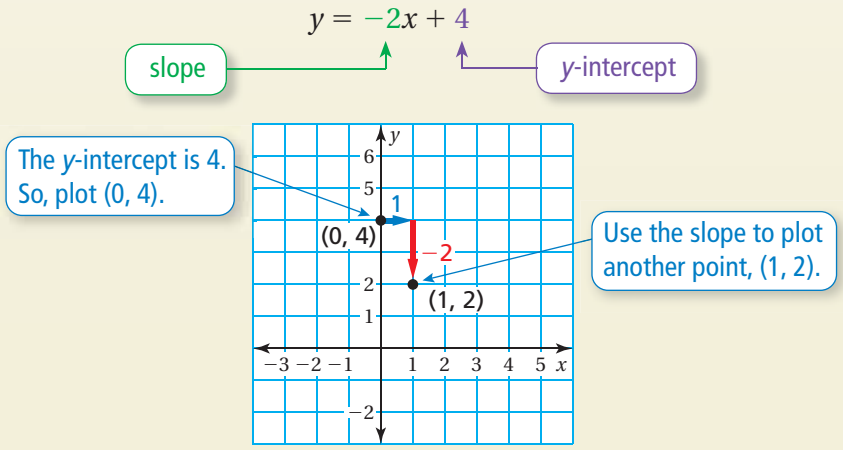
Step 1: Write the equation in slope-intercept form.

$8x + 4y = 16$ Write the equation.

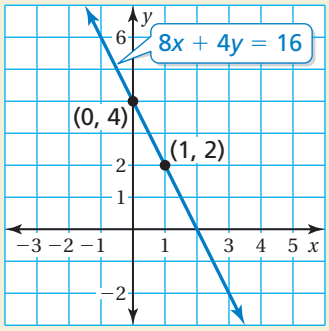
$4y = -8x + 16$ Subtract $8x$ from each side.

$y = -2x + 4$ Divide each side by 4.

Step 2: Use the slope and y-intercept to plot two points.



Step 3: Draw a line through the points.



Exercises

Graph the linear equation.

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

14. $-4x + 2y = 8$

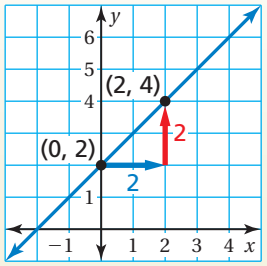
15. $x + 5y = 10$

16. $-\frac{1}{2}x + \frac{1}{8}y = \frac{3}{4}$

17. A dog kennel charges \$30 per night to board your dog and \$6 for each hour of play time. The amount of money you spend is given by $30x + 6y = 180$, where x is the number of nights and y is the number of hours of play time. Graph the equation and interpret the intercepts.

2.5 Writing Equations in Slope-Intercept Form *(pp. 72–77)*

Write an equation of the line in slope-intercept form.

a. 

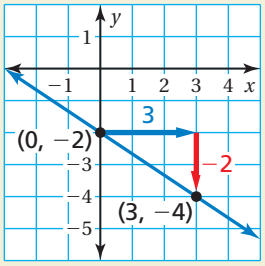
Find the slope and y-intercept.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{2 - 0} = \frac{2}{2}, \text{ or } 1$$

Because the line crosses the y-axis at $(0, 2)$, the y-intercept is 2.

slope: 1 — y-intercept: 2

∴ So, the equation is $y = 1x + 2$, or $y = x + 2$.

b. 

Find the slope and y-intercept.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - (-2)}{3 - 0} = \frac{-2}{3}, \text{ or } -\frac{2}{3}$$

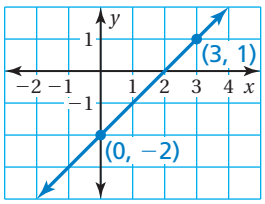
Because the line crosses the y-axis at $(0, -2)$, the y-intercept is -2.

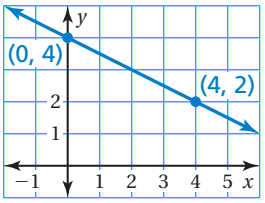
slope: $-\frac{2}{3}$ — y-intercept: -2

∴ So, the equation is $y = -\frac{2}{3}x + (-2)$, or $y = -\frac{2}{3}x - 2$.

Exercises

Write an equation of the line in slope-intercept form.

18. 

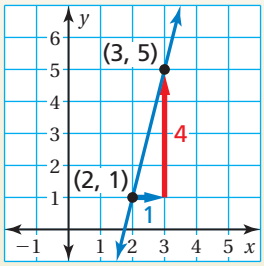
19. 

20. Write an equation of the line that passes through $(0, 8)$ and $(6, 8)$.

21. Write an equation of the line that passes through $(0, -5)$ and $(-5, -5)$.

2.6 Writing Equations in Point-Slope Form *(pp. 78–85)*

Write in slope-intercept form an equation of the line that passes through the points (2, 1) and (3, 5).



Find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 1}{3 - 2} = \frac{4}{1}, \text{ or } 4$$

Then use the slope and one of the given points to write an equation of the line.

Use $m = 4$ and $(2, 1)$.

$y - y_1 = m(x - x_1)$	Write the point-slope form.
$y - 1 = 4(x - 2)$	Substitute 4 for m, 2 for x_1, and 1 for y_1.
$y - 1 = 4x - 8$	Use Distributive Property.
$y = 4x - 7$	Write in slope-intercept form.

∴ So, the equation is $y = 4x - 7$.

Exercises

22. Write in point-slope form an equation of the line that passes through the point $(4, 4)$ with slope 3.

23. Write in slope-intercept form an equation of the line that passes through the points $(-4, 2)$ and $(6, -3)$.

2.7 Solving Real-Life Problems *(pp. 86–91)*

The amount y (in dollars) of money you have left after playing x games at a carnival is $y = -0.75x + 10$. How much money do you have after playing eight games?

$y = -0.75x + 10$	Write the equation.
$= -0.75(8) + 10$	Substitute 8 for x.
$= 4$	Simplify.

∴ You have \$4 left after playing 8 games.

Exercises

24. HAY The amount y (in bales) of hay remaining after feeding cows for x days is $y = -3.5x + 105$. (a) Graph the equation. (b) Interpret the x- and y-intercepts. (c) How many bales are left after 10 days?