Check Homework

Exercises 7. $3, 1$ **9.** $2, -5$ **11.** $5, -3$ **13.** $0, 4$
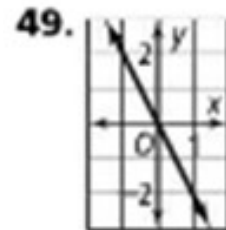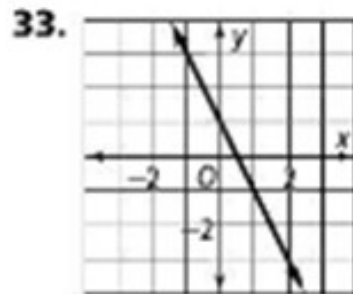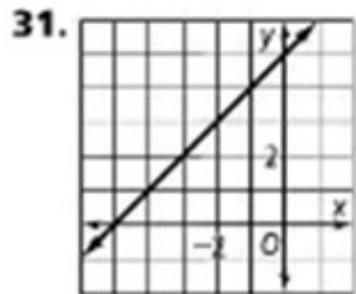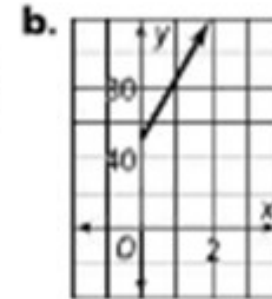
15. $\frac{1}{4}, -\frac{1}{3}$ **17.** $y = 3x + 2$ **19.** $y = 0.7x - 2$

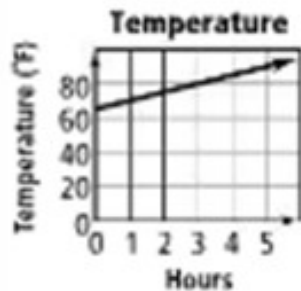**21.** $y = -2x + \frac{8}{5}$ **23.** $y = 2x - 3$ **25.** $y = -2x +$

27. $y = \frac{5}{2}x - \frac{1}{2}$ **29.** $y = -x + 2$

47a. $y = 35x + 50$

c. The amount of time the repair takes and the cost must be positive.

b.

31.

33.

49.

51.

53.

49. $y = 5x + 65$

Temperature
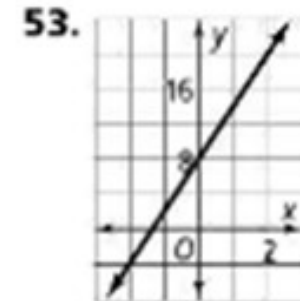
37. $-3, 2$

39. $9, \frac{1}{2}$
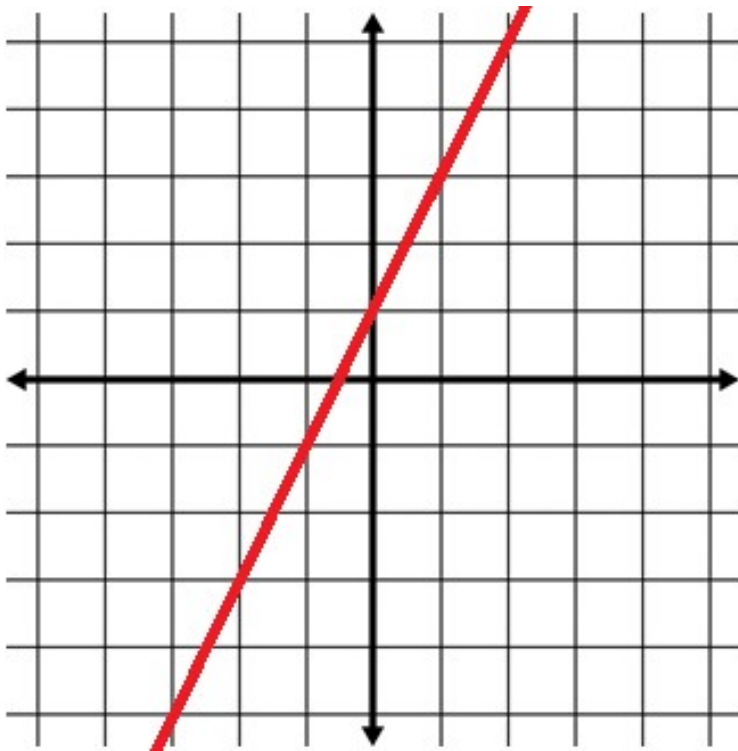
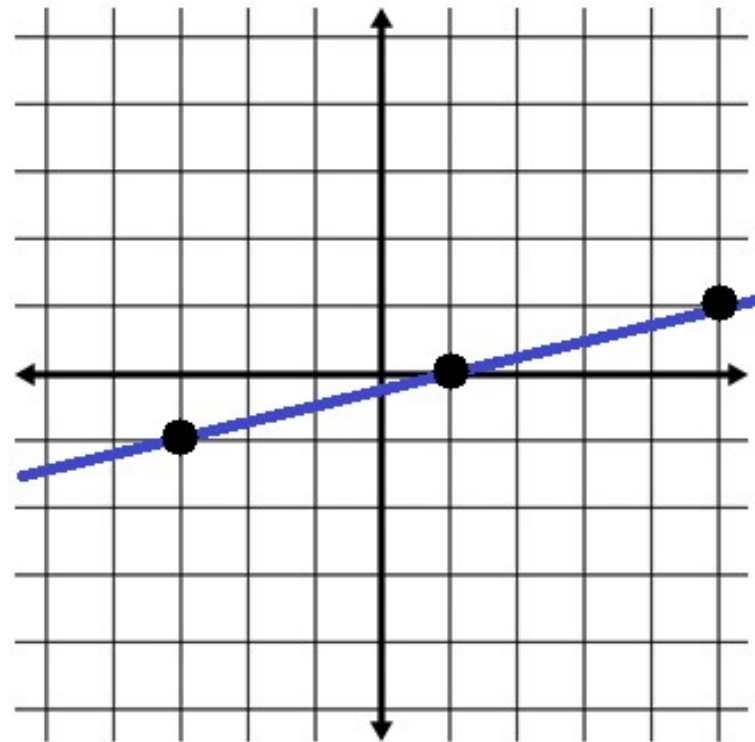**41.** $9, -15$

43. $2 - a, a$

45. 2030

55. $a_1 = -1, a_n = a_{n-1} + 4$; $y = 4x - 5$; the common difference of 4 is equal to the slope of the line in slope-intercept form. **57.** Answers may vary. Samples: graph

Bellwork

What is the equation *(in slope-intercept form)* for the line graphed below?

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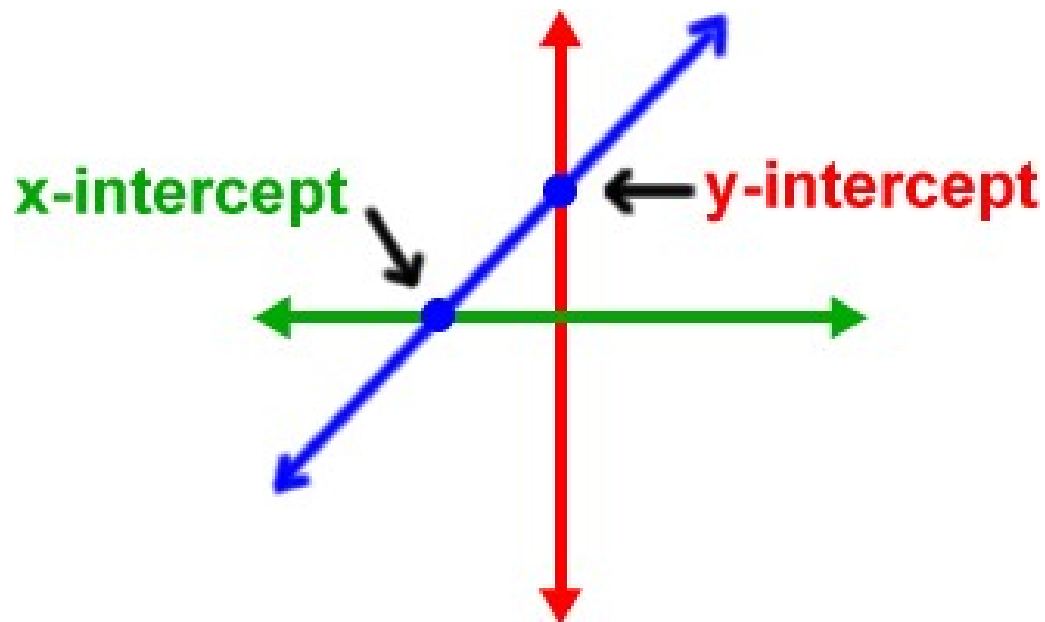**I can graph linear equations using intercepts.**

I can write linear equations in standard form.

x-intercept – the *x*-coordinate of a point where a graph crosses the *x*-axis.

standard form of a linear equation – $Ax + By = C$, where *A*, *B*, and *C* are real numbers, and *A* and *B* are not both zero.

I can graph linear equations using intercepts.
I can write linear equations in standard form.

In this lesson, you will learn to use intercepts to graph a line. Recall that a *y*-intercept is the *y*-coordinate of a point where a graph crosses the *y*-axis. The **x-intercept** is the *x*-coordinate of a point where a graph crosses the *x*-axis.

I can graph linear equations using intercepts.
I can write linear equations in standard form.

take note

Key Concept   Standard Form of a Linear Equation

The **standard form of a linear equation** is $Ax + By = C$, where A, B, and C are real numbers, and A and B are not both zero.

I can graph linear equations using intercepts.
I can write linear equations in standard form.

© **Problem 1** Finding x- and y-Intercepts

What are the x- and y-intercepts of the graph of $3x + 4y = 24$?

Step 1 To find the x-intercept, substitute 0 for y. Solve for x.

$$3x + 4y = 24$$

Step 2 To find the y-intercept, substitute 0 for x. Solve for y.

$$3x + 4y = 24$$

1. What are the x- and y-intercepts of the graph of each equation?

    a. $5x - 6y = 60$

Problem 2 Graphing a Line Using Intercepts

What is the graph of $x - 2y = -2$?

Know

An equation of the line

Need

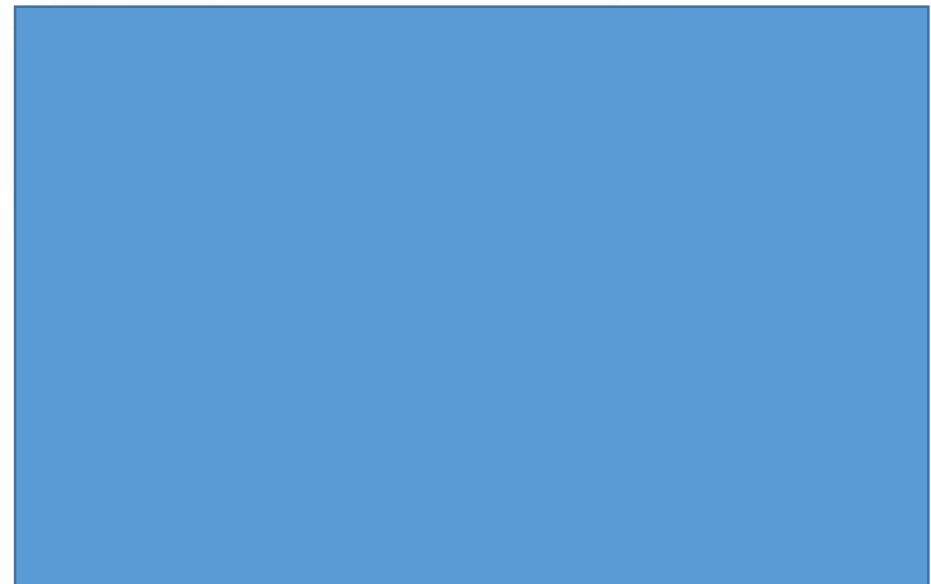The coordinates of at least two points on the line

Plan

Find and plot the x- and y-intercepts. Draw a line through the points.

Step 1 Find the intercepts.

$$x - 2y = -2$$

$$x - 2y = -2$$

2. What is the graph of $2x + 5y = 20$?
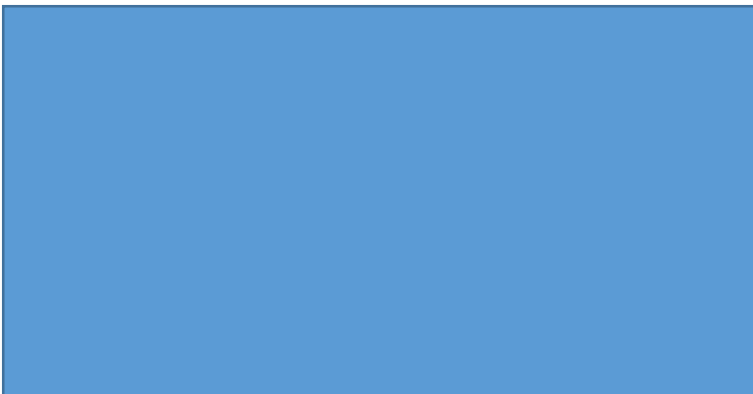
Problem 3 **Graphing Horizontal and Vertical Lines**
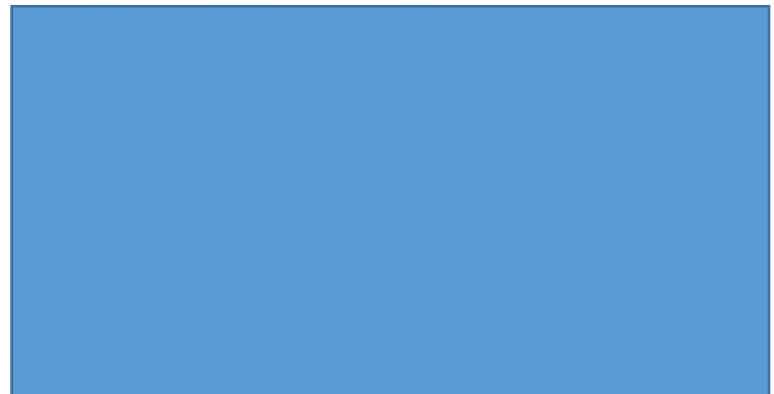
What is the graph of each equation?

A $x = 3$

$1x + 0y = 3$ ← Write in standard form. →

B $y = 3$

$0x + 1y = 3$

I can graph linear equations using intercepts.
I can write linear equations in standard form.

Problem 4 Transforming to Standard Form

What is $y = -\frac{3}{7}x + 5$ written in standard form using integers?

4. Write $y - 2 = -\frac{1}{3}(x + 6)$ in standard form using integers.

Problem 5 Using Standard Form as a Model

Online Shopping A media download store sells songs for $1 each and movies for $12 each. You have $60 to spend. Write and graph an equation that describes the items you can purchase. What are three combinations of numbers of songs and movies you can purchase?

Relate | cost of a song | times | number of songs | plus | cost of a movie | times | number of movies | equals | $60

An equation for this situation is _____
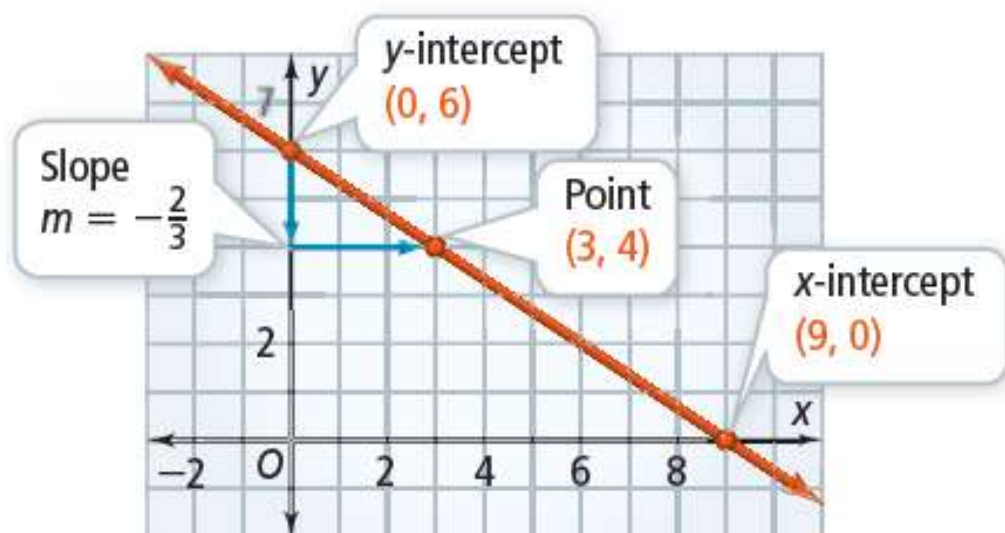Find the intercepts.
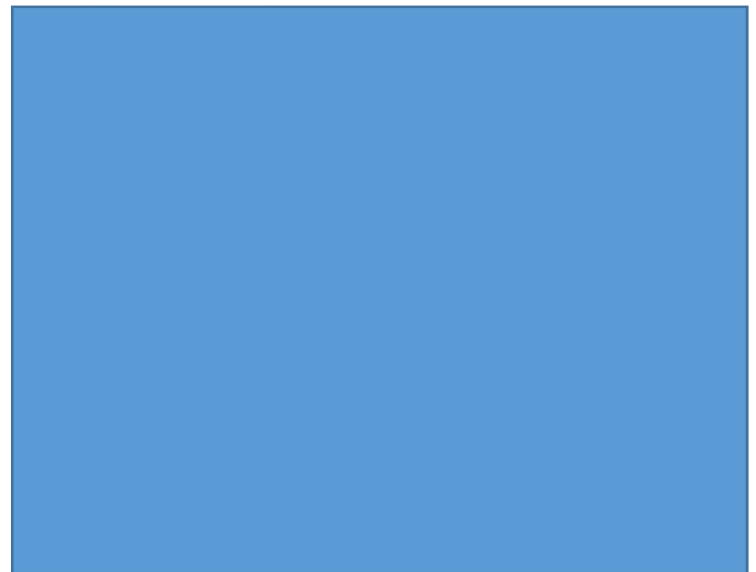
I can graph linear equations using intercepts.
I can write linear equations in standard form.

take note

Concept Summary   Linear Equations

You can describe any line using one or more of these forms of a linear equation. Any two equations for the same line are equivalent.

Graph

Slope
$m = -\frac{2}{3}$

y-intercept
(0, 6)

Point
(3, 4)

x-intercept
(9, 0)

Forms

Slope-Intercept Form

$y = mx + b$

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

Point-Slope Form

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

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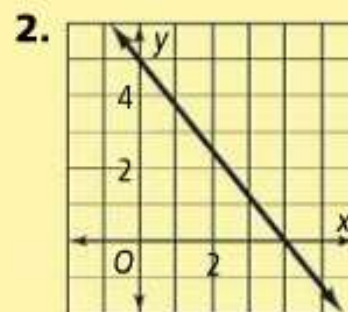
Standard Form

$Ax + By = C$

$2x + 3y = 18$

Lesson Check

Do you know HOW?

1. What are the x- and y-intercepts of the graph of $3x - 4y = 9$?

2. What is the graph of $5x + 4y = 20$?

3. Is the graph of $y = -0.5$ a *horizontal line*, a *vertical line*, or *neither*?

4. What is $y = \frac{1}{2}x + 3$ written in standard form using integers?

5. A store sells gift cards in preset amounts. You can purchase gift cards for $10 or $25. You have spent $285 on gift cards. Write an equation in standard form to represent this situation. What are three combinations of gift cards you could have purchased?