

LESSON
3.5**Study Guide**

For use with the lesson "Graph Using Slope-Intercept Form"

GOAL Graph linear equations using slope-intercept form.**Vocabulary**

A linear equation of the form $y = mx + b$ is written in **slope-intercept form**, where m is the slope and b is the y -intercept of the equation's graph.

Two lines in the same plane are **parallel** if they do not intersect.

EXAMPLE 1 Identify the slope and y -interceptIdentify the slope and y -intercept of the line with the given equation.

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

b. $-2x + 3y = 9$

Solution

a. The equation is in the form $y = mx + b$. So, the slope of the line is $\frac{1}{4}$, and the y -intercept is -2 .

b. Rewrite the equation in slope-intercept form by solving for y .

$$-2x + 3y = 9 \quad \text{Write original equation.}$$

$$3y = 2x + 9 \quad \text{Add } 2x \text{ to each side.}$$

$$y = \frac{2}{3}x + 3 \quad \text{Divide each side by } 3.$$

The line has a slope of $\frac{2}{3}$ and a y -intercept of 3.

Exercises for Example 1Identify the slope and y -intercept of the line with the given equation.

1. $y = -3x + 7$

2. $15x - 5y = 10$

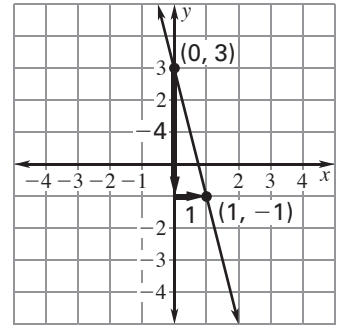
3. $-x - 6y = 18$

LESSON
3.5**Study Guide** *continued*
*For use with the lesson "Graph Using Slope-Intercept Form"***EXAMPLE 2** **Graph an equation using slope-intercept form****Graph the equation $4x + y = 3$.****Solution****STEP 1** Rewrite the equation in slope-intercept form.

$$y = -4x + 3$$

STEP 2 Identify the slope and the y -intercept.

$$m = -4 \text{ and } b = 3$$

STEP 3 Plot the point that corresponds to the y -intercept, $(0, 3)$.**STEP 4** Use the slope to locate a second point on the line. Draw a line through the two points.**Exercises for Example 2****Graph the equation.**

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

5. $y = -x$

EXAMPLE 3 **Identify parallel lines****Determine which of the lines are parallel: line a through $(-3, 1)$ and $(-6, 7)$; line b through $(-7, -5)$ and $(1, 11)$; line c through $(2, 5)$ and $(4, 9)$.****Solution**

Find the slope of each line.

Line a : $m = \frac{7-1}{-6-(-3)} = \frac{6}{-3} = -2$

Line b : $m = \frac{11-(-5)}{1-(-7)} = \frac{16}{8} = 2$

Line c : $m = \frac{9-5}{4-2} = \frac{4}{2} = 2$

Line b and line c have the same slope, so they are parallel.**Exercise for Example 3**

6. Determine which of the lines are parallel: line a through $(5, 3)$ and $(8, 5)$; line b through $(-2, 9)$ and $(1, 11)$; line c through $(12, 8)$ and $(8, 2)$.