Name _____ Class _____ Date _____

3-3 Reteaching

Slope-Intercept Form

The **slope-intercept form** of a linear equation is $y = mx + b$. In this equation, m is the slope and b is the y-intercept.

Problem

What are the slope and y-intercept of the graph of $y = -2x - 3$?

The equation is solved for y, but it is easier to determine the y-intercept if the right side is written as a sum instead of a difference.

$y = -2x - 3$

$y = -2x + (-3)$ Write the subtraction as addition.

The slope is –2 and the y-intercept is –3.

Problem

What is an equation for the line with slope $\frac{2}{3}$ and y-intercept 9?

When the slope and y-intercept are given, substitute the values into the slope-intercept form of a linear equation.

$y = mx + b$

$y = \frac{2}{3}x + 9$ Substitute $\frac{2}{3}$ for m and 9 for b.

Problem

What is an equation in slope-intercept form for the line that passes through the points (1, –3) and (3, 1)?

Substitute the two given points into the slope formula to find the slope of the line.

$$m = \frac{1-(-3)}{3-1} = \frac{4}{2} = 2$$

Then substitute the slope and the coordinates of one of the points into the slope-intercept form to find b.

$y = mx + b$	Use slope-intercept form.
$-3 = 2(1) + b$	Substitute 2 for m, 1 for x, and –3 for y.
$-5 = b$	Solve for b.

Substitute the slope and y-intercept into the slope-intercept form.

$y = mx + b$	Use slope-intercept form.
$y = 2x + (-5)$	Substitute 2 for m and –5 for b.

Name _____ Class _____ Date _____

3-3 Reteaching (continued)

Slope-Intercept Form

Exercises

Find the slope and *y*-intercept of the graph of each equation.

1. $y = \frac{1}{2}x + 7$

2. $y = -5x + 1$

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

4. $y = x + 5$

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

6. $y = 4x$

Write an equation for the line with the given slope *m* and *y*-intercept *b*.

7. $m = -3, b = 7$

8. $m = \frac{2}{3}, b = 8$

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

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

11. $m = -\frac{5}{6}, b = 0$

12. $m = 7, b = -2$

Write an equation in slope-intercept form for the line that passes through the given points.

13. (1, 3) and (2, 5)

14. (2, –1) and (4, 0)

15. (1, 2) and (2, –1)

16. (1, –5) and (3, –3)

17. (3, 3) and (6, 5)

18. (4, –3) and (8, –4)

19. Consider the equation $y = -2x + 4$.

a. What is the *y*-intercept of the graph of the equation?

b. Graph the *y*-intercept.

c. What is the slope of the graph of the equation?

d. Use the point you graphed in part (b) and the slope to find another point on the graph of the equation.

e. Graph the equation.