NAME ______________________________ DATE __________

Reteaching with Practice

For use with pages 426–431

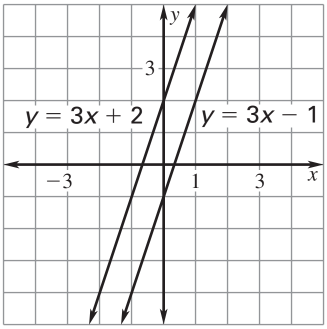
GOAL **Identify linear systems as having one solution, no solution, or infinitely many solutions and model real-life problems using a linear system**

EXAMPLE 1 *A Linear System with No Solution*

Show that the linear system has no solution.

$3x - y = 1$ Equation 1

$3x - y = -2$ Equation 2



SOLUTION

Method 1: GRAPHING Rewrite each equation in slope-intercept form. Then graph the linear system.

$y = 3x - 1$ Revised Equation 1

$y = 3x + 2$ Revised Equation 2

Because the lines have the same slope but different y-intercepts, they are parallel. Parallel lines never intersect, so the system has no solution.

Method 2: SUBSTITUTION Because Equation 2 can be revised to $y = 3x + 2$, you can substitute $3x + 2$ for y in Equation 1.

$3x - y = 1$ Write Equation 1.

$3x - (3x + 2) = 1$ Substitute $3x + 2$ for y.

$-2 = 1$ Simplify. False statement.

The variables are eliminated and you have a statement that is not true regardless of the values of x and y. The system has no solution.

Exercises for Example 1

Choose a method to solve the linear system and tell how many solutions the system has.

1. $2x - y = 1$
$6x - 3y = 12$

2. $x + y = 5$
$3x + 3y = 7$

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

EXAMPLE 2 *A Linear System with Many Solutions*

Use linear combinations to show that the linear system has infinitely many solutions.

$3x + y = 4$ Equation 1

$6x + 2y = 8$ Equation 2

NAME _____ NAME _____ DATE _____ DATE _____

Reteaching with Practice

For use with pages 426–430

EXAMPLE 2

SOLUTION

You can multiply Equation 1 by -2.

$-6x - 2y = -8$	Multiply Equation 1 by -2.
$\underline{6x + 2y = 8}$	Write Equation 2.
$0 = 0$	Add the equations.

The variables are eliminated and you have a statement that is true regardless of the values of x and y. The system has infinitely many solutions.

Exercises for Example 2

Choose a method to solve the linear system and tell how many solutions the system has.

4. $2x + 3y = 6$
$6x + 9y = 18$

5. $4x + 6y = 12$
$6x + 9y = 18$

6. $4x - 2y = 6$
$2x - y = 3$

EXAMPLE 3

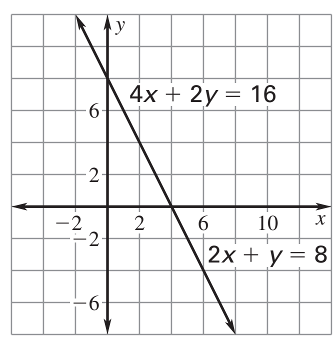
Modeling a Real-Life Problem

An artist is buying art supplies. She buys 4 sketchpads and 2 palettes. She pays $16 for the supplies. The following week, at the same prices, she buys 2 sketchpads and one palette and pays $8. Can you find the price of one sketchpad? Explain.

SOLUTION

EXAMPLE 3

Let x represent the price of a sketchpad and let y represent the price of a palette. Determine the number of solutions of the linear system:



$4x + 2y = 16$	Equation 1
$2x + y = 8$	Equation 2

Use the graphing method to identify the number of solutions for the linear system. Rewrite each equation in slope-intercept form and graph the linear system.

$y = -2x + 8$	Revised Equation 1
$y = -2x + 8$	Revised Equation 2

The equations represent the same line. Any point on the line is a solution. You cannot find the price of one sketchpad.

Exercise for Example 3

7. Rework Example 3, if the cost of the second purchase was $5 for one sketchpad and one palette.