LESSON 7.3

NAME ______________________ DATE ____________

Reteaching with Practice

For use with pages 411–417

GOAL **Use linear combinations to solve a system of linear equations and model a real-life problem using a system of linear equations**

VOCABULARY

A **linear combination** of two equations is an equation obtained by adding one of the equations (or a multiple of one of the equations) to the other equation.

EXAMPLE 1 *Using Multiplication First*

Solve the linear system. $4x - 3y = 11$ Equation 1

$3x + 2y = -13$ Equation 2

SOLUTION

The equations are arranged with like terms in columns. You can get the coefficients of y to be opposites by multiplying the first equation by 2 and the second equation by 3.

$4x - 3y = 11$	Multiply by 2.	$8x - 6y = 22$	
$3x + 2y = -13$	Multiply by 3.	$\underline{9x + 6y = -39}$	
		$17x = -17$	Add the equations.
		$x = -1$	Solve for x.

Substitute -1 for x in the second equation and solve for y.

$3x + 2y = -13$	Write Equation 2.
$3(-1) + 2y = -13$	Substitute -1 for x.
$-3 + 2y = -13$	Simplify.
$y = -5$	Solve for y.

The solution is $(-1, -5)$.

Exercises for Example 1

Use linear combinations to solve the system of linear equations.

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

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

3. $x - y = -4$
$x + 2y = 5$

Lesson 7.3

NAME ______________________________ DATE ____________

Reteaching with Practice

For use with pages 411–417

EXAMPLE 2 Writing and Using a Linear System

A pharmacy mailed 300 advertisements, smaller ads requiring \$.33 postage and larger ads requiring \$.55 postage. If the total cost of postage was \$121, find the number of advertisements mailed at each rate.

Solution

Verbal Model

$\boxed{\text{Number of smaller ads}} + \boxed{\text{Number of larger ads}} = \boxed{\text{Total number of ads}}$

$\boxed{\text{Postage for smaller ads}} \cdot \boxed{\text{Number of smaller ads}} + \boxed{\text{Postage for larger ads}} \cdot \boxed{\text{Number of larger ads}} = \boxed{\text{Total cost of postage}}$

Labels

Number of smaller ads $= x$ (ads)

Number of larger ads $= y$ (ads)

Total number of ads $= 300$ (ads)

Postage for smaller ads $= 0.33$ (dollars per ad)

Postage for larger ads $= 0.55$ (dollars per ad)

Total cost of postage $= 121$ (dollars)

Algebraic Model

$x + y = 300$ Equation 1 (ads)

$0.33x + 0.55y = 121$ Equation 2 (dollars)

Use linear combinations to solve for y.

$-0.33x - 0.33y = -99$ Multiply Equation 1 by -0.33.

$\underline{0.33x + 0.55y = 121}$ Write Equation 2.

$0.22y = 22$ Add the equations.

$y = 100$ Solve for y.

Substitute 100 for y in Equation 1 and solve for x.

$x + y = 300$ Write Equation 1.

$x + 100 = 300$ Substitute 100 for y.

$x = 200$ Solve for x.

The solution is $(200, 100)$. The pharmacy mailed 200 smaller ads and 100 larger ads.

Exercises for Example 2

4. Rework Example 2 if the total cost of postage was \$154.

5. Rework Example 2 if the pharmacy mailed 320 advertisements.