LESSON 7.2

NAME _____ DATE _____

Reteaching with Practice

For use with pages 405–410

GOAL **Use substitution to solve a linear system and model a real-life situation using a linear system**

EXAMPLE 1 The Substitution Method

Solve the linear system. $x + y = 1$ Equation 1

$2x - 3y = 12$ Equation 2

SOLUTION

Solve for y in Equation 1.

$y = -x + 1$ Revised Equation 1

Substitute $-x + 1$ for y in Equation 2 and solve for x.

$2x - 3y = 12$	Write Equation 2.
$2x - 3(-x + 1) = 12$	Substitute $-x + 1$ for y.
$2x + 3x - 3 = 12$	Distribute the -3.
$5x - 3 = 12$	Simplify.
$5x = 15$	Add 3 to each side.
$x = 3$	Solve for x.

To find the value of y, substitute 3 for x in the revised Equation 1.

$y = -x + 1$	Write revised Equation 1.
$y = -3 + 1$	Substitute 3 for x.
$y = -2$	Solve for y.

The solution is $(3, -2)$.

Exercises for Example 1

Use the substitution method to solve the linear system.

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

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

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

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EXAMPLE 2 Writing and Using a Linear System

An investor bought 225 shares of stock, stock A at \$50 per share and stock B at \$75 per share. If \$13,750 worth of stock was purchased, how many shares of each kind did the investor buy?

SOLUTION

Verbal Model

[Amount of stock A] + [Amount of stock B] = [Total amount of stock]

[Price of stock A] · [Amount of stock A] + [Price of stock B] · [Amount of stock B] = [Total investment]

Labels

Amount of stock A = x (shares)

Amount of stock B = y (shares)

Total amount of stock = 225 (shares)

Price of stock A = 50 (dollars per share)

Price of stock B = 75 (dollars per share)

Total investment = 13,750 (dollars)

Algebraic Model

$x + y = 225$ Equation 1 (shares)

$50x + 75y = 13{,}750$ Equation 2 (dollars)

Solve for y in Equation 1.

$y = -x + 225$ Revised Equation 1

Substitute $-x + 225$ for y in Equation 2 and solve for x.

$50x + 75y = 13{,}750$ Write Equation 2.

$50x + 75(-x + 225) = 13{,}750$ Substitute $-x + 225$ for y.

$50x - 75x + 16{,}875 = 13{,}750$ Distribute the 75.

$-25x = -3125$ Simplify.

$x = 125$ Solve for x.

To find the value of y, substitute 125 for x in the revised Equation 1.

$y = -x + 225$ Write revised Equation 1.

$y = -125 + 225$ Substitute 125 for x.

$y = 100$ Solve for y.

The solution is (125, 100).

Exercises for Example 2

4. Rework Example 2 if the investor bought 200 shares of stock.

5. Rework Example 2 if \$16,250 worth of stock was purchased.