Name _____ Class _____ Date _____

Reteaching 6-3

Solving Systems Using Elimination

OBJECTIVE: Solving systems of linear equations using elimination	**MATERIALS:** At least 15 of each of three types or colors of objects, such as beans, colored cubes, or paper clips

When both linear equations of a system are in the form $Ax + By = C$, you can solve the system by elimination. You can use different objects (or, in the example below, symbols) to represent A, B, and C.

Example

Model each equation. Then solve the system of linear equations by elimination.

$$4x - 5y = -7$$
$$4x + y = -1$$

Use: ✹ for the coefficient of x,
■ for the coefficient of y, and
✦ for the constant.

a.

$$\begin{array}{l} \quad x \qquad\quad y \\ ✹✹✹✹ - ■■■■■ = -✦✦✦✦✦✦✦ \\ ✹✹✹✹ + ■ \qquad\quad = -✦ \\ \hline \end{array}$$

b. Since there are an equal number of ✹s, subtract the second equation to eliminate x.

$$\begin{array}{l} ✹✹✹✹ - ■■■■■ = -✦✦✦✦✦✦✦ \\ (-)✹✹✹✹ + (-)■ \qquad = (-)-✦ \\ \hline \qquad\qquad - ■■■■■■ = -✦✦✦✦✦✦ \end{array}$$

c. Since there are six items on the variable side of the equation, divide by 6 on both sides to find that $y = 1$.

d. Now solve for the value of the eliminated variable in either equation.

$4x - 5(1) = -7$ ← **Substitute 1 for *y*.**

$4x = -2$ ← **Solve for *x*.**

$x = -\frac{1}{2}$

Since $x = -\frac{1}{2}$ and $y = 1$, the solution is $(-\frac{1}{2}, -1)$.

Check. See whether $(-\frac{1}{2}, 1)$ makes the other equation true.

$$4x + y = -1$$
$$4(-\tfrac{1}{2}) + 1 \stackrel{?}{=} -1$$
$$-1 = -1 \checkmark$$

Exercises

Use different objects that represent *A*, *B*, and *C* to model and solve each system by elimination.

1. $3x + 5y = 6$
$-3x + y = 6$

2. $2x + 4y = -4$
$2x + y = 8$

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

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