Name Pg 509 503 Class 6 Date

11.3 Solving Linear Systems by Adding or Subtracting

Essential Question: How can you solve a system of linear equations by adding and subtracting?

Resource Locker

Explore Exploring the Effects of Adding Equations

Systems of equations can be solved by graphing, substitution, or by a third method, called **elimination.**

(A) Look at the system of linear equations.

$\begin{cases} 2x - 4y = -10 \\ 3x + 4y = 5 \end{cases}$ Standard Form

What do you notice about the coefficients of the y-terms?

Opposites

(B) What is the sum of $-4y$ and $4y$? How do you know?

$-4y + 4y = 0$

(C) Find the sum of the two equations by combining like terms.

$$\begin{array}{rrcr} 2x & -4y & = & -10 \\ +3x & +4y & = & +5 \\ \hline 5x & + 0 & = & -5 \end{array}$$

$\frac{5x}{5} = \frac{-5}{5}$

(D) Use the equation from Step C to find the value of x.

$x =$ -1

$2(-1) - 4y = -10$

$-2 - 4y = -10$

$+2 \qquad +2$

$-4y = -8$

$y = 2$

(E) Use the value of x to find the value of y. What is the solution of the system?

$y =$ 2

Solution: (-1, 2)

Reflect

1. **Discussion** How do you know that when both sides of the two equations were added, the resulting sums were equal?

2. **Discussion** How could you check your solution?

Evaluate: Homework and Practice

- Online Homework
- Hints and Help
- Extra Practice

1. Which method of elimination would be best to solve the system of linear equations? Explain.

$$\begin{cases} \frac{1}{2}x + \frac{3}{4}y = -10 \\ -x - \frac{3}{4}y = 1 \end{cases}$$

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Solve each system of linear equations by adding or subtracting.

2. $\begin{cases} 3x + 2y = 10 \\ 3x - y = 22 \end{cases}$

3. $\begin{cases} -2x + y = 3 \\ 3x - y = -2 \end{cases}$ (1, 5)

$1x = 1$
$x = 1$
$-2(1) + y = 3$
$-2 + y = 3$
$+2 \quad +2$
$y = 5$

4. $\begin{cases} x + y = 5 \\ x - 3y = 3 \end{cases}$

5. $\begin{cases} 7x + y = -4 \\ 2x - y = 1 \end{cases}$

6. $\begin{cases} -5x + y = -3 \\ 5x - 3y = -1 \end{cases}$ (1, 2)

$\frac{-2y}{-2} = \frac{-4}{-2}$
$y = 2$
$-5x + 2 = -3$
$-2 \quad -2$
$-5x = -5$
$x = 1$

7. $\begin{cases} 2x + y = -6 \\ -5x + y = 8 \end{cases}$

8. $\begin{cases} 6x - 3y = 15 \\ 4x - 3y = -5 \end{cases}$

9. $\begin{cases} 8x - 6y = 36 \\ -2x + 6y = 0 \end{cases}$