

5-Minute Check

Over Lesson 6-2

Use substitution to solve the system of equations.

$$\begin{aligned} x &= -2y \\ x + y &= 4 \end{aligned}$$

$$\begin{aligned} -2y + y &= 4 \\ -y &= 4 \\ y &= -4 \end{aligned}$$

$$\begin{aligned} x &= -2(-4) \\ x &= 8 \end{aligned}$$

$$(8, -4)$$

Use substitution to solve the system of equations.

$$4x - y = 2$$

$$\frac{1}{4}y = x - \frac{1}{2}$$

$$\begin{aligned} -y &= -4x + 2 \\ y &= 4x - 2 \end{aligned}$$

$$\frac{1}{4}(4x - 2) = x - \frac{1}{2}$$

all real #'s
infinite solutions $x - \frac{1}{2} = x - \frac{1}{2}$



Mathematical Practices

7 Look for and make use of structure.

Content Standards

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.



KeyConcept Solving by Elimination

Step 1 Write the system so like terms with the same or opposite coefficients are aligned.

Step 2 Add or ~~subtract~~ the equations, eliminating one variable. Then solve the equation.

Step 3 Substitute the value from Step 2 into one of the equations and solve for the other variable. Write the solution as an ordered pair.

- ① Line up your terms in both equations
- ② Add the equations (one variable goes away) & solve for the variable.
- ③ Substitute to find other variable

Example 1

Elimination Using Addition

Use elimination to solve the system of equations.

$$-3x + 4y = 12$$

$$+ 3x - 6y = 18$$

$$\begin{array}{r} -2y = 30 \\ -2y \quad -2 \end{array}$$

$$y = \boxed{-15}$$

$$(-24, -15)$$

(x, y)

$$\begin{array}{r} -3x + 4(-15) = 12 \\ -3x - 60 = 12 \\ \quad +60 \quad +60 \end{array}$$

$$\begin{array}{r} -3x = 72 \\ \quad -3 \quad -3 \end{array}$$

$$x = -24$$

Example 1

Guided Practice

Use elimination to solve the system of equations.

$$3x - 5y = 1$$

$$2x + 5y = 9$$

$$\frac{5x}{5} = \frac{10}{5}$$

$$x = 2$$

$$\begin{array}{r} 3(2) - 5y = 1 \\ -6 - 5y = 1 \\ \hline -5y = -5 \\ y = 1 \end{array}$$

(2, 1)

$$\begin{array}{r} -x + y = 4 \\ 2x + y = -4 \end{array}$$

(w/)

$$\begin{array}{r} -3y = -4 \\ y = \frac{4}{3} \end{array}$$

$$\begin{array}{r} x - y = -4 \\ 2x + y = -4 \end{array}$$

$$\frac{3x}{3} = \frac{-18}{3} \quad x = -6$$

Example 2

Write and Solve a System of Equations

Four times one number minus three times another number is 12. Two times the first number added to three times the second number is 6. Find the numbers.

$$4x - 3y = 12$$

$$2x + 3y = 6$$

$$(3, 0)$$

$$6x = 18$$

$$\frac{6x}{6} = \frac{18}{6}$$

$$x = 3$$

$$2(3) + 3y = 6$$

$$6 + 3y = 6$$

$$3y = 0$$

$$y = 0$$