

## 5-Minute Check

Over Lesson 6-1

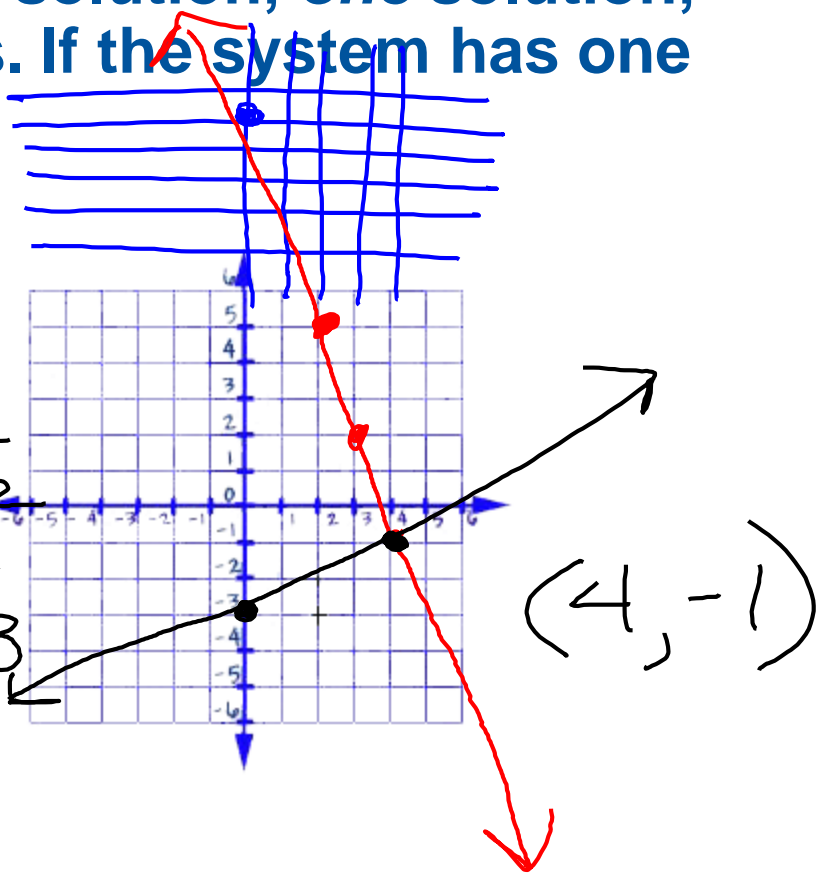
- 2** Graph the system of equations. Then determine whether the system has *no* solution, *one* solution, or *infinitely many* solutions. If the system has one solution, name it.

$$3x = 11 - y$$

$$x - 2y = 6$$

$$\begin{array}{r}
 3x = 11 - y \\
 +y \qquad +y \\
 \hline
 y + 3x = 11 \\
 -3x \qquad -3x \\
 \hline
 y = -3x + 11
 \end{array}$$

$$\begin{array}{r}
 x - 2y = 6 \\
 -x \qquad -x \\
 \hline
 -2y = -x + 6 \\
 \frac{-2y}{-2} = \frac{-x + 6}{-2} \\
 y = \frac{1}{2}x - 3
 \end{array}$$



$(4, -1)$



## Mathematical Practices

2 Reason abstractly and quantitatively.

## Content Standards

A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

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

**Key Concept** Solving by Substitution

**Step 1** When necessary, solve at least one equation for one variable.

**Step 2** Substitute the resulting expression from Step 1 into the other equation to replace the variable. Then solve the equation.

**Step 3** Substitute the value from Step 2 into either equation, and solve for the other variable.  
Write the solution as an ordered pair.

*Take what you get in  
Step 1 & plug it in to other  
equation.*

## Example 1

## Solve a System by Substitution

Use substitution to solve the system of equations.

$$y = -4x + 12$$

$$2x + y = 2$$

Substitute  $-4x + 12$  for  $y$  in the second equation.

$$2x + (-4x + 12) = 2$$

$$2x + -4x + 12 = 2$$

$$\begin{array}{r} -2x + 12 = 2 \\ -12 \quad -12 \\ \hline \end{array}$$

$$\begin{array}{r} -2x = -10 \\ -2 \quad -2 \\ \hline \end{array}$$

$$x = 5$$

$$\begin{array}{l} y = -4(5) + 12 \\ y = -20 + 12 \end{array}$$

$$y = -8 \quad (5, -8)$$

Step 1:  $y =$

Step 2: plug in to other equation & Simplify/Solve

Step 3: Plug your answer from Step 2 into an original equation

## Example 1

## Guided Practice

Use substitution to solve the system of equations.

$$y = 2x$$

$$3x + 4y = 11$$

$$3x + 4(2x) = 11$$

$$3x + 8x = 11$$

$$11x = 11$$

$$x = 1$$

$$y = 2(1)$$

$$y = 2$$

$(x, y)$

$(1, 2)$

## Example 2

### Solve and then Substitute

Use substitution to solve the system of equations.

$$x - 2y = -3$$

$$3x + 5y = 24$$

Solve for  $x$

$$\begin{array}{r} x - 2y = -3 \\ + 2y \quad + 2y \\ \hline x = 2y - 3 \end{array}$$

Step 2: plug in to other equation

$$3(2y - 3) + 5y = 24$$

$$6y - 9 + 5y = 24$$

$$\begin{array}{r} 11y - 9 = 24 \\ + 9 \quad + 9 \\ \hline 11y = 33 \end{array}$$

$$11y = 33$$

$$y = 3$$

$$\begin{array}{l} x = 2(3) - 3 \\ x = 6 - 3 \\ x = 3 \end{array}$$

$$(3, 3)$$



## Example 2

## Guided Practice

Use substitution to solve the system of equations.

$$3x - y = -12$$

$$-4x + 2y = 20$$

**Example 3****No Solution or Infinitely Many Solutions**

Use substitution to solve the system of equations.

$$2x + 2y = 8$$

$$x + y = -2$$





## Example 3

## Guided Practice

Use substitution to solve the system of equations.

$$3x - 2y = 3$$

$$-6x + 4y = -6$$