

# Algebra I

## Lesson 7-2

- I can solve systems of equations by using substitution.
- I can solve real-world problems involving systems of equations.



$3x + y = 8$   
 $y = x - 4$       $(3, -1)$

x	x	x	x
x	x	x	x
x	x	x	x
x	x	x	x

$x = 3$   
 $y = 3 - 4 = -1$

1	1	1	1
1	1	1	1
1	1	1	1
1	1	1	1

-1	-1	-1	-1
-1	-1	-1	-1
-1	-1	-1	-1
-1	-1	-1	-1

1	1	1	1
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$4x + 3y = 10$   
 $y = x + 1$

$(1, 2)$

**x**

$x=1$   
 $y=1+1=2$

The exact solution of a system of equations can be found by using algebraic methods. The method used in the activity is called **substitution**.

Use substitution to solve the system of equations.

$y = 3x$   
 $x + 2y = -21$

$x + 2y = -21$   
 $x + 2(3x) = -21$   
 $x + 6x = -21$   
 $7x = -21$   
 $\frac{7x}{7} = \frac{-21}{7}$   
 $x = -3$

$y = 3(-3)$   
 $y = -9$

$(-3, -9)$

$-9 = 3(-3)$   
 $-9 = -9$  ✓

$-3 + 2(-9) = -21$   
 $-3 + -18 = -21$   
 $-21 = -21$  ✓

Solve for one variable, then use substitution to solve the system of equations.

$$x + 5y = -3$$

$$3x - 2y = 8$$

$$\begin{array}{r} x + 5y = -3 \\ -5y = -5y \\ \hline x = -5y - 3 \end{array}$$

$$\begin{array}{l} x = -5(-1) - 3 \\ x = 5 - 3 \\ x = 2 \end{array}$$

$$3(-5y - 3) - 2y = 8$$

$$-15y - 9 - 2y = 8$$

$$-17y - 9 = 8$$

$$\begin{array}{r} +9 \quad +9 \\ -17y = 17 \end{array}$$

$$\begin{array}{r} -17y = 17 \\ \hline -17 \quad -17 \\ y = -1 \end{array}$$

$$(2, -1)$$

$$2 + 5(-1) = -3$$

$$2 - 5 = -3$$

$$-3 = -3$$

$$\begin{array}{l} 3(2) - 2(-1) = 8 \\ 6 + 2 = 8 \end{array}$$

$$8 = 8$$

$$\begin{array}{l} 8 = 8 \\ \hline \end{array}$$

Use substitution to solve the system of equations.

$$6x - 2y = -4$$

$$y = 3x + 2$$

$$6x + 2(3x + 2) = -4$$

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

$$-4 = -4$$

Infinitely many  
solutions

A metal alloy is 25% copper. Another metal alloy is 50% copper. How much of each alloy should be used to make 1000 grams of a metal alloy that is 45% copper?

	25% Copper	50% Copper	45% Copper	
Total Grams	$t + f = 1000$			←
Grams of Copper	$0.25t + 0.5f = 0.45(1000)$			←



## Assignment:

Pg. 379-380 #12-28 even, 29-35

