Name _____

6-3 Solving Systems Using Elimination

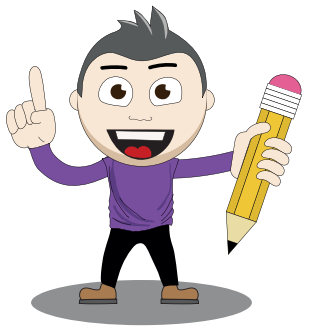
OBJECTIVE: **I can solve systems by adding or subtracting to eliminate a variable**

Warm-Up

A cafeteria sells fresh fruit by weight. All apples weigh the same, and all oranges weigh the same. What is the weight of an apple? What is the weight of an orange? How do you know?

Essential Understanding

Essential Understanding There is more than one way to solve a system of equations. Some systems are written in a way that makes eliminating a variable a good method to use.



Example #1 Solving a System by Adding Equations

What is the solution of the system? Use elimination.

$$2x + 5y = 17$$
$$6x - 5y = -9$$

Your Turn to Work it Out

1. What is the solution of each system? Use elimination.

a. $5x - 6y = -32$
$3x + 6y = 48$

b. $-3x - 3y = 9$
$3x - 4y = 5$

Example #2 Solving a System by Subtracting Equations

Multiple Choice The theater club sells a total of 101 tickets to its first play. A student ticket costs $1. An adult ticket costs $2.50. Total ticket sales are $164. How many student tickets were sold?

A 25

B 24

C 59

D 76

Your Turn to Work it Out

2. Washing 2 cars and 3 trucks takes 130 min. Washing 2 cars and 5 trucks takes 190 min. How long does it take to wash each type of vehicle?

Example #3 Solving a System by Multiplying One Equation

What is the solution of the system? Use elimination.

$$-2x + 15y = -32$$
$$7x - 5y = 17$$

Your Turn to Work it Out

3. a. How can you use the Multiplication Property of Equality to change an equation in this system in order to solve it using elimination?

$$-5x - 2y = 6$$
$$3x + 6y = 6$$

b. Write and solve a revised system.

c. Show that the solution of the revised system is a solution of the original system.

Example #4 Solving a System by Multiplying Both Equations

What is the solution of the system? Use elimination.

$$3x + 2y = 1$$
$$4x + 3y = -2$$

Your Turn to Work it Out

4. a. How can you use the Multiplication Property of Equality to change the equations in this system in order to solve it using elimination?

$$4x + 3y = -19$$
$$3x - 2y = -10$$

b. Write and solve a revised system.

c. Show that the solution of the revised system is a solution of the original system.

Example #5 Finding the Number of Solutions

How many solutions does the system have?

$$2x + 6y = 18$$
$$x + 3y = 9$$

Your Turn to Work it Out

5. How many solutions does the system have?

$$-2x + 5y = 7$$
$$-2x + 5y = 12$$