

Name: \_\_\_\_\_

### Notes #4 - Solving by Elimination

You have already developed some useful strategies for solving a simple linear equation like  $3x + 5 = 10$ . You know that you can add or subtract the same quantity on both sides and preserve equality. The same is true for multiplication or division. These ideas, called the *Properties of Equality*, can help you develop another method for solving linear equations. This method involves combining separate linear equations (through the four basic operations) into one equation with only one variable. **Other names for this method are *Combination, Addition, or Elimination*.**

#### Examples:

1. 
$$\begin{cases} x + y = 3 \\ x - y = -9 \end{cases}$$

2. 
$$\begin{cases} 2x - 4y = 10 \\ -2x + 6y = -4 \end{cases}$$

#### Try It!

a. 
$$\begin{cases} 2x + y = 3 \\ -2x + y = 1 \end{cases}$$

b. 
$$\begin{cases} x + y = 30 \\ x - y = 6 \end{cases}$$

**Examples:**

3. 
$$\begin{cases} 6x - 7y = -4 \\ -4x - 7y = 26 \end{cases}$$

4. 
$$\begin{cases} x + 3y = 9 \\ x - 2y = -6 \end{cases}$$

**Try It!**

a. 
$$\begin{cases} 5x + 7y = 77 \\ 5x + 3y = 53 \end{cases}$$

b. 
$$\begin{cases} 9x - 3y = 24 \\ 7x - 3y = 20 \end{cases}$$

Now let's investigate some other systems that involve other uses of the elimination method.

5. 
$$\begin{cases} 2x + 5y = -1 \\ x + 2y = 0 \end{cases}$$

6. 
$$\begin{cases} 6x + 3y = 0 \\ -3x + 3y = 9 \end{cases}$$

**Try It!**

a. 
$$\begin{cases} 8x - 9y = 19 \\ 4x + y = -7 \end{cases}$$

b. 
$$\begin{cases} 4x - y = 6 \\ 3x + 2y = 21 \end{cases}$$