



Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

### SOLVING SYSTEMS BY ELIMINATION (LINEAR COMBINATIONS) WORKSHEET

**Example:** Solve the system  $2x + y = 5$   
 $4x - y = 13$  by elimination.

Step One: Write the two equations in standard form.

Step Two: Multiply one or both of the equations by a constant to obtain coefficients that are opposites for one of the variables. We already have opposites, so skip to step three.

Step Three: Add the two equations from Step Two.

$$\begin{array}{r} 2x + y = 5 \\ + 4x - y = 13 \\ \hline 6x = 18 \\ x = 3 \end{array}$$

Step Four: Substitute the value from Step Three into either one of the original equations to solve for

$$\begin{array}{l} 2(3) + y = 5 \\ \text{the other variable. } 6 + y = 5 \\ y = -1 \end{array}$$

Step Five: Write your answer as an ordered pair, and plug it in to the original system to see if the point is true for both equations.  $(3, -1)$

**Directions:** Solve each system of equations using linear combinations. Write your answer as an ordered pair. Make sure to check your solutions.

1.)  $x + y = 5$   
 $x + 2y = 7$

2.)  $x + 3y = 4$   
 $x - y = -8$

3.)  $5s + t = -2$   
 $2s + 3t = 7$

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

$$5.) \begin{cases} a - b = 1 \\ 2a + b = 2 \end{cases}$$

$$6.) \begin{cases} 2x + 3y = -5 \\ 4x - 2y = 14 \end{cases}$$

$$7.) \begin{cases} 2x + 2y = 10 \\ 3x - 3y = 9 \end{cases}$$

$$8.) \begin{cases} 3x + 5y = 41 \\ x + 2y = 16 \end{cases}$$

$$9.) \begin{cases} 3c + 6d = -6 \\ 5c - 2d = 14 \end{cases}$$

$$10.) \begin{cases} 3p + q = 4 \\ 3p + q = -1 \end{cases}$$

$$11.) \begin{cases} 2x + 3y = 25 \\ 3x - 4y = -5 \end{cases}$$

12) You are searching for two integers. The sum of twice the first integer and three times the second integer is nine. At the same time, the sum of three times the first integer and twice the second integer is one. Find the two integers.

13) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales, the school sold 3 senior citizen tickets and 1 child ticket for a total of \$38. The school took in \$52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.