Algebra I
Lesson 6.3 – Solving Systems by Elimination
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We found that graphing is not always the best method for solving systems. Likewise substitution is not always easy. When would substitution be difficult? Another method we can employ is **elimination.**

Vocabulary

Elimination – a method to solve systems of equations. **Add** the two equations together. When the equations are combined into one equation, one of the variables is eliminated. The end result is a single equation with one variable. (and guess what? Back to chapter 2, again)

When Sam went to lunch with his friends, he got a speeding ticket. He thought it wise to get a bouquet of flowers for his mom to accompany the news. He spent \$24.75 and bought 12 flowers. The bouquet was a mix of roses and daisies. The roses cost \$2.50 each and the daisies cost \$1.75 a piece. How many of each type of flower did Sam buy? Did the bouquet make the news of the traffic ticket easier for his mom?

$2.50r + 1.75d = 24.75$
$r + d = 12$

$2.50r + 1.75d = 24.75$
$(-1.75)(r + d) = (12)(-1.75)$ *distribute*

$2.50r + 1.75\cancel{d} = 24.75$
$-1.75r - 1.75\cancel{d} = -21$ *add*
$.75r = 3.75$
$r = 5$

$5 + d = 12$
$d = 7$

***Answer**: Sam bought 5 roses and 7 daisies. Mom was still really mad, but she hugged Sam and was glad he was safe.*

1. Identify what you need to answer.
2. Underline the facts as they relate to the equations.

3. Write a system of equations. Consider using initials of the flowers for the variables.

4. If we want to add these equations together so to eliminate one of the variables, what do we need to do? Choose a variable to eliminate. Multiply that equation by a number so that when equations are added together one of the variables cancels out.

5. Solve for the remaining variable.
6. Substitute the solution for the variable into one of the equations and solve for the remaining variable.

7. Make sure to answer the question completely using a sentence.

List some reasons why one method may be preferable over the other. Write an example.

Graphing:	**Substitution:**	**Elimination:**

Solve the system by elimination.

$$\begin{cases} x - 2y = -19 \\ 5x + 2y = 1 \end{cases}$$

$$\begin{cases} x + 3y = -7 \\ -x + 2y = -8 \end{cases}$$

$$\begin{cases} 5x + y = 0 \\ 5x + 2y = 30 \end{cases}$$

$$\begin{cases} 2x - 3y = 14 \\ 2x + y = -10 \end{cases}$$

$$\begin{cases} 3x + y = 17 \\ 4x + 2y = 20 \end{cases}$$

$$\begin{cases} 4x - y = -5 \\ -2x + 3y = 10 \end{cases}$$