

Essential Question: Are there other methods we can use to solve linear systems algebraically?

Do Now: Use the substitution method to solve the following linear system. *Don't forget to check your solution in both equations!*

$$4x + 3y = 16$$

$$2x - 3y = 8$$



Is there an easier way to solve the system from the Do Now?

Solving Linear Systems using Elimination

Examples:

1)
$$\begin{aligned} 3x - 5y &= -16 \\ 2x + 5y &= 31 \end{aligned}$$



1. Line up variable terms and constants.
2. Decide which variable term ("x" or "y") will be easier to **eliminate**. In order to eliminate a variable term, the coefficients must be **additive inverses** (*same number, opposite signs*).
3. **Add** each column to **eliminate** the desired variable (*addition property of equality*).
4. The resulting equation should have only **one variable**. Solve this simple equation.
5. Substitute the value of the variable into either of the **original** equations to get the value of the other variable.
6. Check your solution!

2) $4x + y = 7$
 $4x - 2y = -2$

3) $x + y = 10$
 $2x + 3y = 8$

4) $2x - 6y = -6$
 $7x - 8y = 5$



When using the **Elimination Method**, sometimes we need to _____
one or both equations by a number in order to create a pair of variable terms
that are additive inverses (_____).

Solve the following system of equations using the elimination method. *Remember to check your solution.*

1. $c - 2d = 14$
 $c + 3d = 9$

2. $a - 4b = -8$
 $a - 2b = 0$

3. $8a + 5b = 9$
 $2a - 5b = -4$

4. $-2m + 4n = 13$
 $6m + 4n = 9$

5. $4x - y = 10$
 $2x + 3y = 12$

6. $5x + 8y = 1$
 $3x + 4y = -1$