

SOLVING LINEAR SYSTEMS – ELIMINATION METHOD

If you have a linear system, you can solve it by adding or subtracting the equations in order to eliminate a variable.

BUT...what happens when the coefficients are NOT THE SAME????

- Steps:**
- 1) Choose the equation with only an x or y (coefficient of 1) and multiply it by a number to create a term that is the same as in the other equation.
 - 2) Add or subtract the two equations so that you eliminate either of the variables “ x ” or “ y ”.
 - 3) Find the solution for one variable.
 - 4) Substitute the solution into either of the original equations and solve for the other variable.
 - 5) Write a concluding statement " \therefore the solution is (x, y) ."

Examples:

1. Solve:
$$\begin{aligned} x + 3y &= 11 \\ 3x + 2y &= 19 \end{aligned}$$

Multiply one of the equations:

Add or subtract the equations to eliminate one of the variables and then solve:

Solve for the other variable:

Solution:

Multiply one of the equations:		
Add or subtract the equations to eliminate one of the variables and then solve:	Solve for the other variable:	Solution:

2. Solve: $3x - 4y = 16$
 $2x + y = 7$

Multiply one of the equations:		
Add or subtract the equations to eliminate one of the variables and then solve:	Solve for the other variable:	Solution:

Example:

A company hosted a winter holiday reception at a local banquet hall and served two different dinners. There were 200 people who attended the function.

Let x represent the # roast beef dinners and y represent the # of grilled chicken dinners.

This is represented by the equation: $x + y = 200$

The roast beef dinner cost \$21 per plate and the grilled chicken dinner cost \$15 per plate. The dinner cost the company a total of \$3720.

This is represented by the equation: $21x + 15y = 3720$

Q: How many roast beef dinners and grilled chicken dinners were served?

Multiply one of the equations:		
Add or subtract the equations to eliminate one of the variables and then solve:	Solve for the other variable:	Solution: