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Module 10 Solving Systems of Linear Equations and Inequalities

Lesson 2 Solving Systems of Linear Equations by Elimination

guided notes

Lesson Objective

- Solve systems of equations using the elimination method.

A solution to a system of equations is an ordered pair (x, y) that satisfies **all** the equations in the system.

1. Solve:

$$\begin{cases} x - 8y = -1 \\ 4x - 8y = 8 \end{cases}$$

$\left(3, \frac{1}{2}\right)$

2. Solve:

$$\begin{cases} x + 3y = -20 \\ -x + y = 0 \end{cases}$$

(–5, –5)

3. Solve:

$$\begin{cases} 7x - y = 0 \\ 2x + 2y = 0 \end{cases}$$

(0, 0)

Elimination Method:

- Make sure the equations have like terms aligned in **columns**.
- **Multiply** one or both equations by different numbers to eliminate a variable.
- Make the coefficients of either x or y **opposites**.
- Add the equations to **eliminate** one of the variables.
- **Solve** for the remaining variable.
- Substitute that value into either of the **original** equations.
- Solve for the other variable.
- Check the solution by making sure that the ordered pair satisfies **both** equations in the system.

If a system of equations is solved by elimination and the result is a false statement containing no variables, the system of equations has

no solution.

If a system of equations is solved by elimination and the result is a true statement containing no variables, the system of equations has an

infinite number of solutions.

4 Solve:

$$\begin{cases} 5x - 2y = 3 \\ 2x + 7y = 48 \end{cases}$$

(3, 6)

5 Solve:

$$\begin{cases} x - y = 4 \\ 2x - 2y = 8 \end{cases}$$

The system of equations has an infinite number of solutions.

6 Solve:

$$\begin{cases} x + 2y = 3 \\ 2x + 4y = 8 \end{cases}$$

The system of equations has no solution.