

3.4 Elimination

SWBAT use the elimination method to solve systems of linear equations.

Assignments:
HW20

Vocabulary Review

- ▶ System
 - ▶ A set of equations or inequalities that have the same variables
- ▶ Solution to a system
 - ▶ The value(s) that make *all* the equations or inequalities in the system true
- ▶ Term
 - ▶ A number, a variable, or numbers and variables multiplied together
- ▶ Coefficient
 - ▶ The number being multiplied to a variable
- ▶ Slope-Intercept Form
 - ▶ One of the forms of equations of lines; $y = mx + b$
- ▶ Standard Form
 - ▶ One of the forms of equations of lines; $Ax + By = c$

Solving systems of equations...

- ▶ Graphing works well when the equations are in *slope-intercept form*.
- ▶ What about when the equations are in *standard form*?
 - ▶ $x - 3y = 11$
 - ▶ $-x + 4y = -16$
- ▶ An easier way to solve these is by using the **elimination method**

The Elimination Method

Add the equations in the system to create a new equation in which one of the variables has been canceled out or **eliminated**.

- ▶ Step 1: Decide which variable to eliminate
 - ▶ Look at the **coefficients**. Are there any that are *opposites* (same number, different sign)?
- ▶ Step 2: If necessary, multiply one or both equations to make sure a variable will be eliminated
- ▶ Step 3: Add the equations.
- ▶ Step 4: Solve the new equation.
- ▶ Step 5: Substitute the value you found into one of the original equations and solve for the second variable.

Solve the systems by elimination

▶ Example 1:
$$\begin{aligned} x - 3y &= 11 \\ -x + 4y &= -16 \end{aligned}$$

▶ Example 2:
$$\begin{aligned} -5x + 4y &= 23 \\ -2x - 4y &= -2 \end{aligned}$$

1.
$$\begin{aligned} 2x + 8y &= 10 \\ 2x - 8y &= -6 \end{aligned}$$

2.
$$\begin{aligned} -3x - 2y &= -2 \\ -2x + 2y &= 2 \end{aligned}$$

3.
$$\begin{aligned} 5x + y &= 21 \\ -5x - y &= -21 \end{aligned}$$

4.
$$\begin{aligned} -7x - 9y &= -14 \\ 7x + 9y &= 17 \end{aligned}$$

Your turn! Solve the systems by elimination.

1. $2x + 8y = 10$
 $2x - 8y = -6$

2. $-3x - 2y = -2$
 $-2x + 2y = 2$

3. $5x + y = 21$
 $-5x - y = -21$

4. $-7x - 9y = -14$
 $7x + 9y = 17$

5. $-x + 8y = 3$
 $3x - 8y = 7$

6. $x - y = -3$
 $4x + y = -12$

7. $-x - 7y = -27$
 $x - y = -5$

8. $-x - 10y = 0$
 $x + y = -9$