Solving Systems of Equations by Elimination

LESSON 5.3 LEARNING GOALS:

1) Solve a system of two linear equations by elimination.

Common Core State Standards HSA-CED.A.3, HSA-REI.C.5, HSA-REI.C.6

LESSON 5.3 - Solving Systems of Two Linear **Equations by Elimination**

- **GRAPHING** a system of linear equations allows us to ESTIMATE the solution of the system.
- Solving a system of linear equations by the **SUBSTITUTION** method allows us to find an EXACT solution, but it is only efficient if there is a "bare" variable.
- The **ELIMINATION** method allows us to find an EXACT solution of a system of linear equations no matter what the equations look like.

SOLVING BY ELIMINATION

STEP 1: Multiply one or both of the equations by a constant to obtain coefficients that are the opposite of each other.

STEP 2: Add the revised equations from STEP 1. Combining like terms will eliminate one of the variables. Solve for that variable.

STEP 3: Substitute the value you found in STEP 2 into either of the original equations to solve for the remaining variable.

Solve this system of equations.

$$-5x + 7y = 11$$

$$5x - 3y = -19$$

$$-5x + 7(-2) = 11$$

$$-5x - 14 = 11$$

$$+14 + 14$$

$$-5x = 15$$

$$y = -2$$

$$x = -3$$

$$(-3, -2)$$

Solve this system of equations.

$$-1(6x + 5y) = (9)(-1)$$

$$6x - 2y = 30$$

$$-6x - 5y = -9$$

$$6x - 2y = 30$$

$$-7y = 21$$

$$-7 = -3$$

$$y = -3$$

$$6x + 5(-3) = 9$$

$$6x - 15 = 9$$

$$+15 + 15$$

$$\underline{6x} = 24$$

$$6 = 4$$

Solve this system of equations.

$$2(5x + 3y) = (11)2$$

$$-2x - 6y = 10$$

$$10x + 6y = 22$$

$$-2x - 6y = 10$$

$$\frac{3y}{3} = \frac{-9}{3}$$

$$x = -3$$

$$x = 4$$

$$(-3, 4)$$

5.3 NOTES - Solving Systems of Two Linear Equations by Elimination

Solve this system of equations.

$$-3(2x - 7y) = (-10)(-3)$$

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

$$-6x + 21y = 30$$

$$6x + 4y = 20$$

$$2x - 7(2) = -10$$

$$2x - 14 = -10$$

$$+14 + 14$$

$$2x = 4$$

$$2 = 4$$

$$x = 2$$

$$y = 2$$

$$(2, 2)$$

Solve this system of equations.

$$5(5x - 2y) = (-15)5$$

$$2(7x + 5y) = (18)2$$

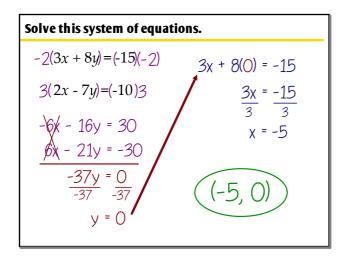
$$25x - 10y = -75$$

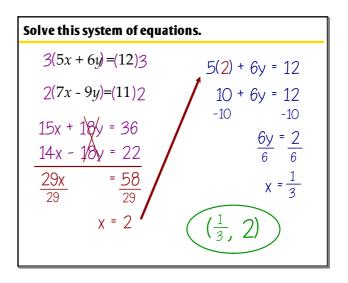
$$14x + 10y = 36$$

$$39x = -39$$

$$x = -1$$

$$(-1, -5)$$





HOMEWORK:

5.3 Worksheet - Solving Systems of Two Linear Equations by Elimination