

Content and Language Objective:

Students will discover another method for solving systems of equations known as the elimination method and be able to explain the process in their own words.

Lesson 23: Solving Systems of Equations Using Elimination

Date: November 3, 2015

Warm - Up

1. Convert from standard form to intercept form. $3x + 4y = 12$

$$\begin{array}{r} -3x \\ 4y = 12 - 3x \\ \hline \frac{4y}{4} = \frac{12}{4} - \frac{3x}{4} \end{array}$$

$$y = 3 - \frac{3}{4}x$$

2. Convert from point-slope form to y-intercept form. $y + 4 = -3(x + 1)$

$$\begin{array}{r} y + 4 = -3x - 3 \\ -4 \quad -4 \\ \hline y = -3x - 7 \end{array}$$

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When using the elimination method the two equations will be in standard form. There are four rules that need to be followed in order to use the elimination method.

The elimination method uses a lot of the same ideas as balancing an equation to help manipulate the equations. $Ax + By = C$

1. Two equations in standard form, with the same variables.
2. In order to use elimination you need to have the same variables.
3. In order to use elimination you need to have the same numbers attached to one of the two variables.
4. In order to use elimination you need to have a negative version and a positive version of the same number.

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$$5(4) - 3y = 18$$

$$\begin{array}{r} 2x + 3y = 10 \\ 5x - 3y = 18 \\ \hline 7x = 28 \\ \hline x = 4 \end{array}$$

$$2(4) + 3y = 10$$

$$\begin{array}{r} 8 + 3y = 10 \\ -8 \quad -8 \\ \hline 3y = 2 \\ \hline y = \frac{2}{3} \end{array}$$

$$\begin{array}{r} 5(4) - 3y = 18 \\ 20 - 3y = 18 \\ -20 \quad -20 \\ \hline -3y = -2 \\ y = \frac{2}{3} \end{array}$$

$$(4, \frac{2}{3})$$

$$y = \frac{2}{3}$$

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$$\begin{array}{r} -2x + 6y = 10 \\ 2x + 4y = 20 \\ \hline 10y = 30 \\ \frac{10}{10} \frac{30}{10} \\ y = 3 \end{array}$$
$$\begin{array}{r} -2x + 6(3) = 10 \\ -2x + 18 = 10 \\ -18 \quad -18 \\ \hline -2x = -8 \\ \frac{-2}{-2} \frac{-8}{-2} \\ x = 4 \end{array}$$

$(4, 3)$

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$$\begin{array}{r} 4x - 7y = 5 \\ 2x + 7y = 7 \\ \hline 6x = 12 \\ \hline 6 \quad 6 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} 4(2) - 7y = 5 \\ 8 - 7y = 5 \\ -8 \quad -8 \\ \hline -7y = -3 \\ \hline -7 \quad -7 \\ \hline y = 3/7 \end{array}$$

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$$\begin{array}{r} 7x + 8y = 12 \\ -7x - 4y = 16 \end{array}$$

