Learning Target:

Question/Main Ideas:	Notes:
Key Idea to Solving by Elimination	eliminate one variable
Example 1: Solving a System by Adding	Solve the system using the Elimination Method. $\begin{array}{r} 2x + 5y = 17 \\ +\quad 6x - 5y = -9 \\ \hline 8x = 8 \\ \dfrac{8}{8} \\ x = 1 \end{array}$ $2(1) + 5y = 17$ $2 + 5y = 17$ $5y = 15$ $y = 3$ $(1, 3)$
Now It's Your Turn	Solve the system using the Elimination Method. $\begin{array}{r} 5x - 6y = -32 \\ +\quad 3x + 6y = 48 \\ \hline \dfrac{8x}{8} = \dfrac{16}{8} \\ x = 2 \end{array}$ $3(2) + 6y = 48$ $6 + 6y = 48$ $\dfrac{-6 \quad -6}{6y = 42}$ $\dfrac{6y}{6} = \dfrac{42}{6} \quad y = 7$ $(2, 7)$
What if the Variables Don't Eliminate Just by Adding?	multiply by a constant
Example 2: Solving a System by Multiplying One Equation	Solve the system using the Elimination Method. $-2x + 15y = -32 \longrightarrow$ $3(7x - 5y = 17) \longrightarrow$ $(1, -2)$ $-2x + 15y = -32$ $\dfrac{21x - 15y = 51}{19x = 19}$ $\dfrac{19x}{19} = \dfrac{19}{19}$ $x = 1$ $7(1) - 5y = 17$ $-5y = 10$ $y = -2$

Now It's Your Turn

Solve the system using the Elimination Method.

$$6x + 5y = 19$$
$$3(-2x + 3y = 5)$$

$$\Rightarrow$$

$$6x + 5y = 19$$
$$-6x + 9y = 15$$
$$\overline{}$$
$$\frac{14y}{14} = \frac{34}{14}$$

$$y = \frac{17}{7}$$

$$\frac{-16}{7} \cdot \frac{1}{-2} = \frac{8}{7} = x$$

$$\left(\frac{8}{7}, \frac{17}{7}\right)$$

$$-2x + \frac{3}{1}\left(\frac{17}{7}\right) = 5$$
$$-2x + \frac{51}{7} = \frac{5}{1}$$
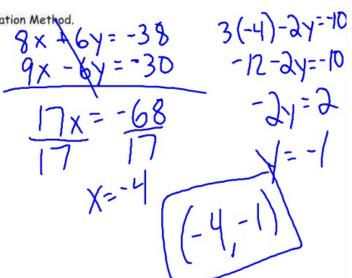$$-2x = \frac{35}{7} - \frac{51}{7}$$
$$\frac{-2x}{-2} = \frac{\frac{-16}{7}}{-2}$$

Example 3: Solving a Linear System by Multiplying Both Equations

Solve the system using the Elimination Method.

$$2(4x + 3y = -19)$$
$$3(3x - 2y = -10)$$

$$\Rightarrow$$

$$8x + 6y = -38$$
$$9x - 6y = -30$$
$$\overline{}$$
$$\frac{17x}{17} = \frac{-68}{17}$$

$$x = -4$$

$$3(-4) - 2y = -10$$
$$-12 - 2y = -10$$
$$-2y = 2$$
$$y = -1$$

$$(-4, -1)$$

Now it's your turn!

Solve the system using the Elimination Method.

$$3x - 2y = 2$$
$$5x - 5y = 10$$

$$15x - 10y = 10$$
$$15x - 15y = 30$$
$$\overline{}$$
$$5y = -20$$
$$y = -4$$

$$3x + 8y = 2$$
$$3x = -6$$
$$x = -2$$

$$(-2, -4)$$