

Name:		Date:
Obj: Solving systems of linear equations using elimination		Class/Period:
Questions/Main Ideas:	Notes:	
What do we know already?	<p>What is a Solution? An ordered Pair</p> <p>How do you solve by graphing? The Intersection</p> <p>How do you solve by substitution? Solve for a variable 1st</p> <p>Now we will be solving equations using elimination, Elimination is the easiest when the equation are in standard form $Ax+By=C$</p>	
Solving systems using addition and subtraction	<p>Elimination: Get rid of a variable</p> <p>Step 1: Put the equations in standard form. Standard form $Ax+By=C$</p> <p>Step 2: Determine which variable to eliminate. Look for variables that have the same coefficient</p> <p>Step 3: ADD or SUBTRACT the equation. Solve for the variable</p> <p>Step 4: plug back in to find the other variable. Substitute the value of the variable into the equation</p>	
Use Addition to Eliminate	<p>Example 1a:</p> $\begin{array}{r} x+y=5 \\ 3x-y=7 \\ \hline 4x=12 \\ \frac{4}{4} \quad \frac{12}{4} \\ \hline x=3 \end{array}$ $\begin{array}{r} x+y=5 \\ -3 \quad -3 \\ \hline 3+y=5 \\ \hline y=2 \end{array}$ <p>(3, 2)</p>	<p>Example 1b:</p> $\begin{array}{r} 2x+3y=11 \\ -2x+5y=13 \\ \hline 8y=24 \\ \frac{8}{8} \quad \frac{24}{8} \\ \hline y=3 \end{array}$ $\begin{array}{r} 2x+3y=11 \\ 2x+9=11 \\ \hline -9 \quad -9 \\ \hline 2x=2 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline x=1 \end{array}$ <p>(1, 3)</p>

<p>Guided Practice</p>	$\begin{array}{r} -5x - 6y = 8 \\ 5x + 2y = 4 \\ \hline -4y = 12 \\ -4 \quad -4 \\ \hline y = -3 \end{array}$ $\begin{array}{r} -5x - 6(-3) = 8 \\ -5x + 18 = 8 \\ -18 \quad -18 \\ \hline -5x = -10 \\ -5 \quad -5 \\ \hline x = 2 \end{array}$ <p>$(2, -3)$</p>	$\begin{array}{r} x - y = 3 \\ 2x + y = 1 \\ \hline 3x = 4 \\ \frac{3x}{3} = \frac{4}{3} \\ x = \frac{4}{3} \end{array}$ $\begin{array}{r} \frac{4}{3} - y = 3 \\ -\frac{4}{3} \quad -\frac{4}{3} \\ \hline -y = \frac{5}{3} \\ \frac{-y}{-1} = \frac{5}{3} \\ y = -\frac{5}{3} \end{array}$ <p>$(\frac{4}{3}, -\frac{5}{3})$</p>
<p>Use Subtraction to Eliminate</p>	<p>Example 2a:</p> $\begin{array}{r} 4x + 3y = 2 \\ -(5x + 3y = -2) \\ \hline -x = 4 \\ x = -4 \end{array}$ $\begin{array}{r} 4(-4) + 3y = 2 \\ -16 + 3y = 2 \\ +16 \quad +16 \\ \hline 3y = 18 \\ \frac{3y}{3} = \frac{18}{3} \\ y = 6 \end{array}$ <p>$(-4, 6)$</p>	<p>Example 2b:</p> $\begin{array}{r} 4x + y = 7 \\ -(4x - 2y = -2) \\ \hline 3y = 9 \\ \frac{3y}{3} = \frac{9}{3} \\ y = 3 \end{array}$ $\begin{array}{r} 4x + y = 7 \\ -4x + 2y = 2 \\ \hline 3y = 9 \\ \frac{3y}{3} = \frac{9}{3} \\ y = 3 \end{array}$ $\begin{array}{r} 4x + 3 = 7 \\ -3 \quad -3 \\ \hline 4x = 4 \\ \frac{4x}{4} = \frac{4}{4} \\ x = 1 \end{array}$ <p>$(1, 3)$</p>
<p>Guided Practice</p>	$\begin{array}{r} 7x - 2y = 5 \\ -(7x - 3y = -4) \\ \hline 7x - 2y = 5 \\ -7x + 3y = 4 \\ \hline y = 9 \end{array}$ $\begin{array}{r} 7x - 2(9) = 5 \\ 7x - 18 = 5 \\ +18 \quad +18 \\ \hline 7x = 23 \\ \frac{7x}{7} = \frac{23}{7} \\ x = \frac{23}{7} \end{array}$ <p>$(\frac{23}{7}, 9)$</p>	$\begin{array}{r} x + y = 1 \\ -2x + y = 4 \end{array}$

Arrange like Terms:

Example 3a:

$$8x - 4y = -4$$

$$4y = 3x + 14$$

$$3x - 3x$$

$$8x - 4y = -4 \rightarrow 8(2) - 4y = -4$$

$$3x + 4y = 14 \quad 16 - 4y = -4$$

$$\frac{5x = 10}{5} \quad \frac{-16 \quad -16}{-4y = -20}$$

$$\frac{5}{5} \quad \frac{-4y}{-4} = \frac{-20}{-4}$$

$$\boxed{x=2}$$

$$\frac{-4y}{-4} = \frac{-20}{-4}$$

$$\boxed{y=5}$$

$$(2, 5)$$

Example 3b:

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

$$2y = 3x + 6$$

Guided Practice



$$2x + 5y = 12$$

$$5y = 4x + 6$$

$$-4x - 4x$$

$$\begin{array}{r} 2x + 5y = 12 \\ -(-4x + 5y = 6) \end{array}$$

$$2x + 5y = 12 \rightarrow 2(1) + 5y = 12$$

$$4x - 5y = -6 \quad 2 + 5y = 12$$

$$\frac{6x = 6}{6} \quad \frac{-2 \quad -2}{5y = 10}$$

$$\frac{6}{6} \quad \frac{6}{6}$$

$$\boxed{x=1}$$

$$\frac{5y = 10}{5} \quad \frac{5}{5}$$

$$\frac{5}{5} \quad \frac{10}{5}$$

$$\boxed{y=2}$$

$$-8y + 6x = 36$$

$$6x - y = 15$$

Try on your own
using addition:

$$\begin{aligned}3x - y &= 30 \\ -3x + 7y &= 6\end{aligned}$$

$$\begin{aligned}-9x + 4y &= -17 \\ 9x - 6y &= 3\end{aligned}$$

Using Subtraction:

$$\begin{aligned}2x - y &= 7 \\ 2x + 7y &= 31\end{aligned}$$

$$\begin{aligned}5x + 6y &= 50 \\ -x + 6y &= 26\end{aligned}$$

Arranging like terms:

$$\begin{aligned}2x - y &= -11 \\ y &= -2x - 13\end{aligned}$$

$$\begin{aligned}11y - 3x &= 18 \\ -3x &= -16y + 33\end{aligned}$$

Summary: