

Solving Systems
of Equations
Graphic Organizer!

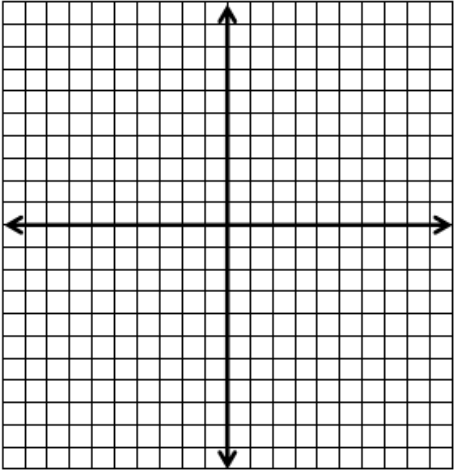
****FREE****

Casola
Classroom
Creations

Systems of Equations Graphic Organizer

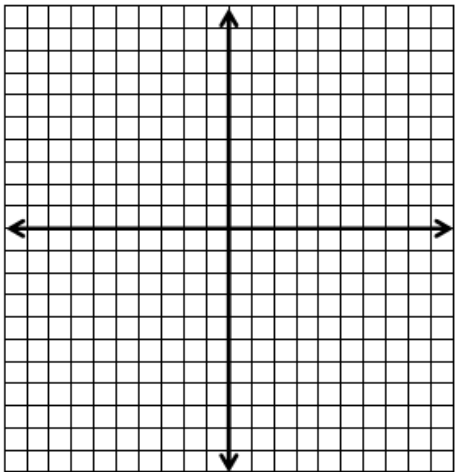
Name: _____ Date: _____ Class Period: _____

Directions: Solve the system of equation using each method. Then determine which method you prefer, and why.

Graphing	Substitution
	
Elimination	Which method do you prefer and why?
$\begin{aligned} y &= 3x + 2 \\ -4x + 2y &= 8 \end{aligned}$	

In the space below, write a system of equations that has no solution.

Directions: Solve the system of equation using each method. Then determine which method you prefer, and why.

<i>Graphing</i>	<i>Substitution</i>
	
Elimination	
<div style="border: 2px solid black; border-radius: 50%; width: 60%; margin: 0 auto; padding: 10px;"> $\begin{aligned} -3x + 7y &= 13 \\ 3x - 4y &= -1 \end{aligned}$ </div>	
	<p><i>Which method do you prefer and why?</i></p>

Suppose you add two linear equations that form a system, and you get the results below. How many solutions does each system have (one solution, no solutions, or infinitely many solutions)?

a) $x = 8$

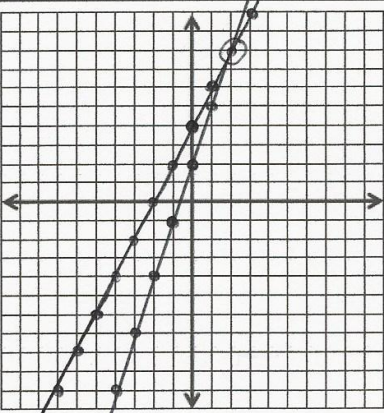
b) $0 = 4$

c) $0 = 0$

Systems of Equations Graphic Organizer

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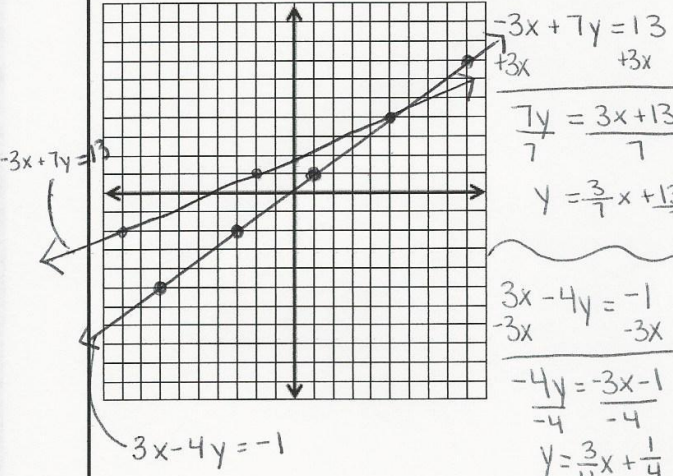
Directions: Solve the system of equation using each method. Then determine which method you prefer, and why.

Graphing	Substitution
 <p style="margin-left: 20px;"> $y = 3x + 2$ $m = 3$ $b = 2$ </p> <p style="margin-left: 20px;"> $-4x + 2y = 8$ $+4x \quad +4x$ <hr style="width: 50%; margin-left: 0;"/> $2y = 4x + 8$ $\frac{2y}{2} = \frac{4x + 8}{2}$ $y = 2x + 4$ </p> <p style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">(2, 8)</p>	<p>① $-4x + 2y = 8$ ② $y = 3x + 2$</p> <p>$-4x + 2(3x + 2) = 8$ $y = 3(2) + 2$</p> <p>$-4x + 6x + 4 = 8$ $y = 6 + 2$</p> <p style="margin-left: 40px;"> $\frac{-4x + 6x + 4}{2} = \frac{8}{2}$ $2x + 4 = 8$ $y = 8$ </p> <p style="margin-left: 40px;"> $\frac{-4 \quad -4}{2} = \frac{-8}{2}$ $2x = 4$ </p> <p style="margin-left: 40px;"> $\frac{2x}{2} = \frac{4}{2}$ $x = 2$ </p> <p style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">(2, 8)</p>
<div style="border: 1px solid black; border-radius: 50%; width: 60%; margin: 0 auto; padding: 10px;"> $y = 3x + 2$ $-4x + 2y = 8$ </div>	
<p>Elimination</p> <p> $y = 3x + 2$ $-3x \quad -3x$ $(-3x + y = 2) \cdot -2 \rightarrow 6x - 2y = -4$ $-4x + 2y = 8 \quad \rightarrow -4x + 2y = 8 \quad (+)$ </p> <p style="margin-left: 40px;"> $\frac{6x - 2y = -4}{-4x + 2y = 8}$ $\frac{+2x = 4}{2 \quad 2}$ $x = 2$ </p> <p style="margin-left: 40px;"> $-4x + 2y = 8$ $-4(2) + 2y = 8$ $-8 + 2y = 8$ $+8 \quad +8$ $2y = 16$ $y = 8$ </p> <p style="text-align: center; border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">(2, 8)</p>	<p style="text-align: center;">* Answers may vary *</p> <p>For me, substitution was the easiest because one of the equations in the system was already solved for 'y.'</p>
<p>Which method do you prefer and why?</p>	

In the space below, write a system of equations that has no solution.

Answers will vary! Students are correct as long as the two lines in their system are parallel.
 ex: $\begin{cases} y = 2x + 4 \\ y = 2x + 7 \end{cases}$ OR $\begin{cases} y = 6x - 1 \\ y = 6x + 100 \end{cases}$

Directions: Solve the system of equation using each method. Then determine which method you prefer, and why.

Graphing	Substitution
	$\begin{array}{r} 3x - 4y = -1 \\ -3x \quad -3x \\ \hline -4y = -3x - 1 \\ \frac{-4y}{-4} = \frac{-3x - 1}{-4} \\ y = \frac{3}{4}x + \frac{1}{4} \end{array}$ $\begin{array}{r} -3x + 7\left(\frac{3}{4}x + \frac{1}{4}\right) = 13 \\ -3x + \frac{21}{4}x + \frac{7}{4} = 13 \\ \frac{9}{4}x + \frac{7}{4} = 13 \\ \quad -\frac{7}{4} \quad -\frac{7}{4} \\ \hline \frac{9}{4}x = \frac{45}{4} \quad \frac{4}{9} \cdot \frac{9}{4}x = \frac{45}{4} \cdot \frac{4}{9} \rightarrow x = 5 \end{array}$ $\begin{array}{r} -3x + 7y = 13 \\ -3(5) + 7y = 13 \\ -15 + 7y = 13 \\ \quad +15 \quad +15 \\ \hline 7y = 28 \\ \frac{7y}{7} = \frac{28}{7} \\ y = 4 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(5, 4)</div>
<div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block;"> $\begin{array}{r} -3x + 7y = 13 \\ 3x - 4y = -1 \end{array}$ </div>	
<p>Elimination</p> $\begin{array}{r} -3x + 7y = 13 \\ (+) 3x - 4y = -1 \\ \hline 3y = \frac{12}{3} \\ y = 4 \end{array}$ $\begin{array}{r} -3x + 7y = 13 \\ -3x + 7(4) = 13 \\ -3x + 28 = 13 \\ \quad -28 \quad -28 \\ \hline -3x = -15 \\ \frac{-3x}{-3} = \frac{-15}{-3} \\ x = 5 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">(5, 4)</div>	<p style="text-align: center;">Which method do you prefer and why?</p> <p style="text-align: center;">*Answers may vary*</p> <p>I prefer the elimination method. Of the three methods, elimination was by far the least complicated because the linear equations have a pair of additive inverses (3 & -3) as the coefficients of the 'x' variables. This made solving by elimination simple, and solving by substitution/graphing extremely complex!</p>

Suppose you add two linear equations that form a system, and you get the results below. How many solutions does each system have (one solution, no solutions, or infinitely many solutions)?

a) $x = 8$

one solution

b) $0 = 4$

no solutions

c) $0 = 0$

infinitely many solutions

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