Solving Systems of Equations Graphic Organizer!

FREE

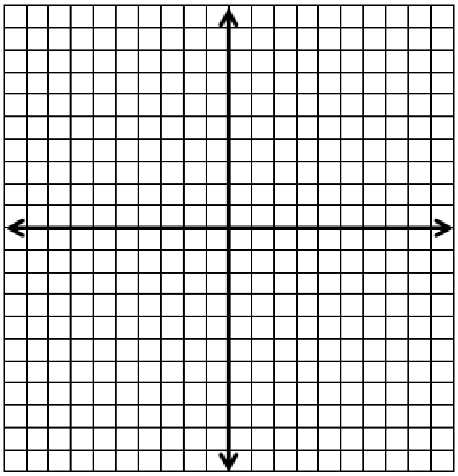
Casola Classroom Creations

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

$$y = 3x + 2$$
$$-4x + 2y = 8$$

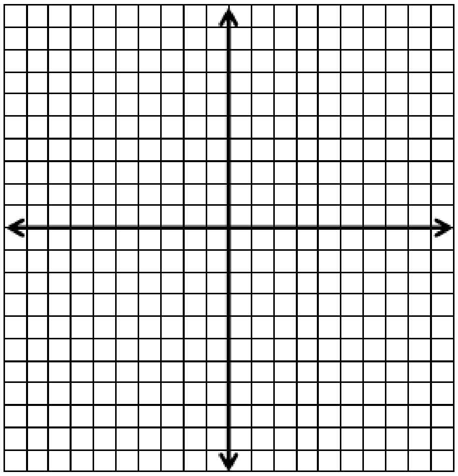
Elimination

Which method do you prefer and why?

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.

Graphing



Substitution

Elimination

$$-3x + 7y = 13$$
$$3x - 4y = -1$$

Which method do you prefer and why?

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) $0 = 0$

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$$y = 3x + 2$$
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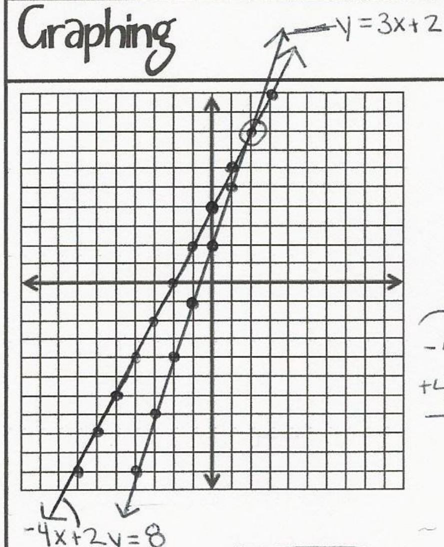
Graphing



y = 3x + 2
m = 3
b = 2

-4x + 2y = 8
+4x   +4x

2y/2 = (4x+8)/2

y = 2x + 4

(2,8)

Substitution

① -4x + 2y = 8
-4x + 2(3x+2) = 8
-4x + 6x + 4 = 8
2x + 4 = 8
  -4   -4
2x/2 = 4/2
x = 2

② y = 3x+2
y = 3(2)+2
y = 6+2
y = 8

(2, 8)

Elimination

y = 3x + 2
-3x   -3x
(-3x + y = 2)·-2 → 6x - 2y = -4
-4x + 2y = 8 → -4x + 2y = 8 (+)
+2x/2 = 4/2
x = 2

-4x + 2y = 8
-4(2) + 2y = 8
-8 + 2y = 8
+8   +8
2y = 16
y = 8

(2,8)

Which method do you prefer and why?

Answers may vary

For me, substitution was the easiest because one of the equations in the system was already solved for 'y.'

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

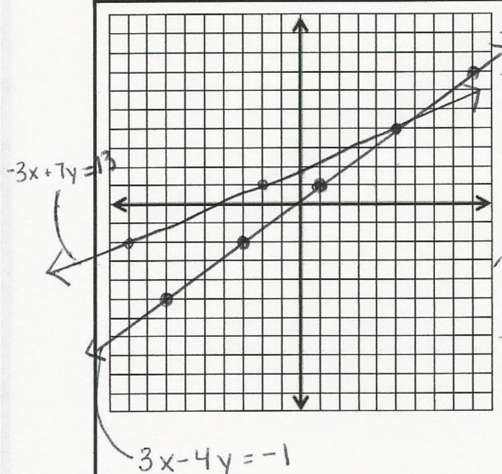
Answers will vary! Students are correct as long as the two lines in their system are parallel.

ex: { y = 2x + 4, y = 2x + 7 } OR { y = 6x - 1, y = 6x + 100 }

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

$$-3x + 7y = 13$$
$$3x - 4y = -1$$

Graphing



$-3x + 7y = 13$
$+3x \quad\quad +3x$
$\frac{7y}{7} = \frac{3x+13}{7}$
$y = \frac{3}{7}x + \frac{13}{7}$

$3x - 4y = -1$
$-3x \quad\quad -3x$
$\frac{-4y}{-4} = \frac{-3x-1}{-4}$
$y = \frac{3}{4}x + \frac{1}{4}$

Substitution

$3x - 4y = -1$
$-3x \quad\quad -3x$
$\frac{-4y}{-4} = \frac{-3x-1}{-4}$
$y = \frac{3}{4}x + \frac{1}{4}$

$-3x + 7\left(\frac{3}{4}x + \frac{1}{4}\right) = 13$
$-3x + \frac{21}{4}x + \frac{7}{4} = 13$
$\frac{9}{4}x + \frac{7}{4} = 13$
$-\frac{7}{4} \quad -\frac{7}{4}$
$\frac{4}{9} \cdot \frac{9}{4}x = \frac{45}{4} \cdot \frac{4}{9} \rightarrow x = 5$

$-3x + 7y = 13$
$-3(5) + 7y = 13$
$-15 + 7y = 13$
$+15 \quad\quad +15$
$\frac{7y}{7} = \frac{28}{7}$
$y = 4$

(5, 4)

Elimination

$-3x + 7y = 13$
$(+)\ 3x - 4y = -1$
$\frac{3y}{3} = \frac{12}{3}$
$y = 4$

$-3x + 7y = 13$
$-3x + 7(4) = 13$
$-3x + 28 = 13$
$-28 \quad -28$
$\frac{-3x}{-3} = \frac{-15}{-3}$
$x = 5$

(5, 4)

Which method do you prefer and why?

Answers may vary

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!

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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