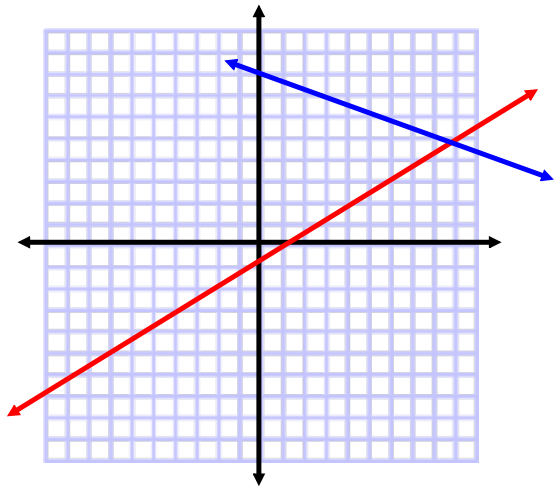
What About This System...Solution???



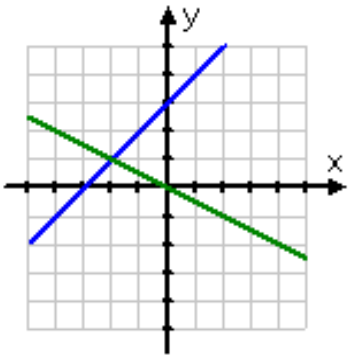
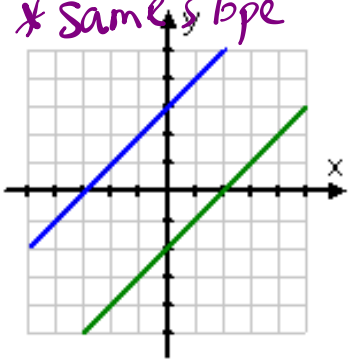
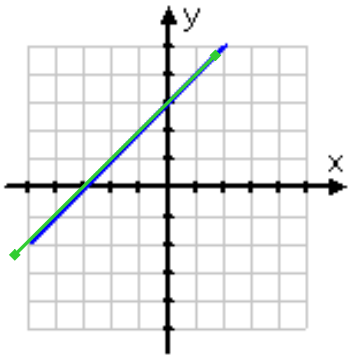
1) Need graph paper

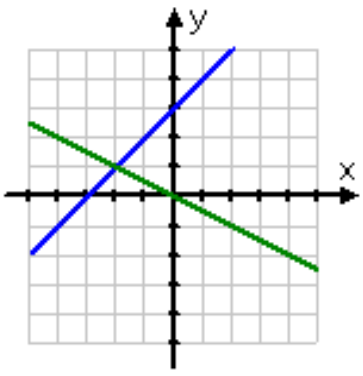
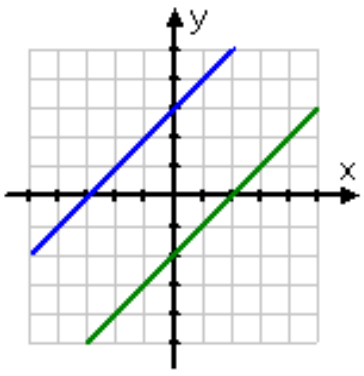
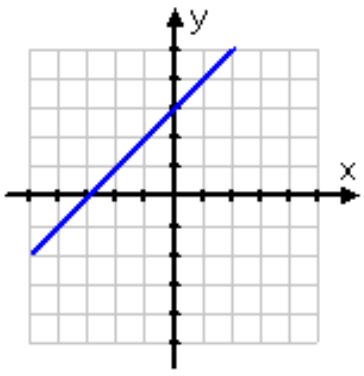
2) Accuracy?

3) Rational Solutions (decimals)?

Problems with the method???

When you are solving systems, you are, graphically, finding intersections of lines. For two-variable systems, there are then three possible types of solutions:

Intersection Point	Parallel Lines	Same Lines
Case 1	**Case 2**	**Case 3**
	 * same slope	
1 Solution	NO Solution	Infinite Solutions

Independent system: one solution and one intersection point	**Inconsistent system: no solution and no intersection point**	**Dependent system: the solution is the whole line**
		

Solving Systems of Equations Using Substitution

The method of solving "by substitution" works by solving one of the equations (you choose which one) for one of the variables (you choose which one), and then plugging this back into the other equation, "substituting" for the chosen variable and solving for the other. Then you back-solve for the first variable.

EXAMPLE...Substitution Method

- Solve the following system by substitution.

$$2x - 3y = -2 \quad (1)$$
$$4x + y = 24 \quad (2)$$

(2) $y = 24 - 4x$ ..... (3)

Sub (3) into (1)

$2x - 3(24 - 4x) = -2$

$2x - 72 + 12x = -2$

$14x = -2 + 72$

$\frac{14x}{14} = \frac{70}{14}$

$x = 5$ ..... (4)

Sub (4) into (3)

$y = 24 - 4x$

$= 24 - 4(5)$

$= 24 - 20$

$= 4$

Solution $(5, 4)$

STEPS...

1) Rearrange ONE equation to either 'x =' or 'y ='

[FIND THE LONE VARIABLE]

2) SUBSTITUTE this equation into the **other equation**

3) SOLVE this new equation with only 1 variable

4) Back substitute to get the other unknown variable.

EXAMPLE #2: $y = -4x - 18$ ①

$2x + 3y = -24$ ②

Sub ① into ②

$2x + 3(-4x - 18) = -24$

$2x - 12x - 54 = -24$

$-10x = -24 + 54$

$\frac{-10x}{-10} = \frac{30}{-10}$

$x = -3$ ..... ③

Sub ③ into ①

$y = -4x - 18$

$= -4(-3) - 18$

$= 12 - 18$

$= -6$

Solution $(-3, -6)$

YOUR TURN...

$-2x + y = 6$ ①

$-8x + 2y = 20$ ②

① $y = 2x + 6$ ..... ③

Sub ③ into ②

$-8x + 2(2x + 6) = 20$

$-8x + 4x + 12 = 20$

$-4x = 20 - 12$

$\frac{-4x}{-4} = \frac{8}{-4}$

$x = -2$ ..... ④

Sub ④ into ③

$y = 2x + 6$

$= 2(-2) + 6$

$= -4 + 6$

$= 2$

$(-2, 2)$

PRACTICE PROBLEMS..

ALL odd #'s

Worksheet - Solve by Substitution.pdf

SOLUTIONS...

Kuta Software - Infinite Algebra 1 Name_____

Solving Systems of Equations by Substitution

Date_____ Period____

Solve each system by substitution.

1) $y = 6x - 11$
$-2x - 3y = -7$
(2, 1)

2) $2x - 3y = -1$
$y = x - 1$
(4, 3)

3) $y = -3x + 5$
$5x - 4y = -3$
(1, 2)

4) $-3x - 3y = 3$
$y = -5x - 17$
(−4, 3)

5) $y = -2$
$4x - 3y = 18$
(3, −2)

6) $y = 5x - 7$
$-3x - 2y = -12$
(2, 3)

7) $-4x + y = 6$
$-5x - y = 21$
(−3, −6)

8) $-7x - 2y = -13$
$x - 2y = 11$
(3, −4)

9) $-5x + y = -2$
$-3x + 6y = -12$
(0, −2)

10) $-5x + y = -3$
$3x - 8y = 24$
(0, −3)

11) $x + 3y = 1$
$-3x - 3y = -15$
(7, −2)

12) $-3x - 8y = 20$
$-5x + y = 19$
(−4, −1)

13) $-3x + 3y = 4$
$-x + y = 3$
No solution

14) $-3x + 3y = 3$
$-5x + y = 13$
(−3, −2)

15) $6x + 6y = -6$
$5x + y = -13$
(−3, 2)

16) $2x + y = 20$
$6x - 5y = 12$
(7, 6)

17) $-3x - 4y = 2$
$3x + 3y = -3$
(−2, 1)

18) $-2x + 6y = 6$
$-7x + 8y = -5$
(3, 2)

19) $-5x - 8y = 17$
$2x - 7y = -17$
(−5, 1)

20) $-2x - y = -9$
$5x - 2y = 18$
(4, 1)

Attachments

Worksheet - Solve by Substitution.pdf