Warm Up...

Solve the following systems of equations:

$y = 2x - 3$
$-4x + 3y = -1$

???

$-4x + 3(2x-3) = -1$
$-4x + 6x - 9 = -1$
$2x = 9 - 1$
$2x = 8$
$x = 4$
$y = 2x - 3$
$= 2(4) - 3$
$= 8 - 3$
$= 5$
$(4, 5)$

$3x + 4y = 15$
$y = 6x - 3$

???

$3x + 4(6x-3) = 15$
$3x + 24x - 12 = 15$
$27x = 12 + 15$
$27x = 27$
$x = 1$
$y = 6x - 3$
$= 6(1) - 3$
$= 6 - 3$
$= 3$
$(1, 3)$

$x - 5y = -7$
$5x + 2y = -8$

???

$x = 5y - 7$
$5(5y-7) + 2y = -8$
$25y - 35 + 2y = -8$
$27y = 35 - 8$
$27y = 27$
$y = 1$
$x = 5y - 7$
$= 5(1) - 7$
$= 5 - 7$
$= -2$
$(-2, 1)$

Solving Systems of Equations Using Elimination Method

Objective is to **"ELIMINATE"** one of the variables by either adding or subtracting the two equations.

EXAMPLE #1:

$-4x + 3y = -4$
$4x - y = 12$

$2y = 8$
$y = 4$
$4x - y = 12$
$4x - 4 = 12$
$4x = 16$
$x = 4$
$(4, 4)$

STEPS...

1) Put equations in the Standard Form.

Ax + By = C

NOTE: Number the equations!!!

2) **Multiply equation(s) to get a common coefficient for either x or y terms.**

3) Add OR Subtract equations to ELIMINATE the terms.

4) SOLVE remaining equation for unknown

5) Back substitute to get other unknown

EXAMPLE #2:

$$-2x+6y=-18$$
$$4x-6y=12$$

$\frac{2x}{2} = \frac{-6}{2}$

$x=-3$

$-2x+6y=-18$

$-2(-3)+6y=-18$

$6+6y=-18$

$6y=-24$

$y=-4$

$(-3,-4)$

EXAMPLE #3 - Coefficients are the same sign...

$$3x-y=-11$$
$$3x-5y=-7$$

$4y=4$

$y=-1$

$3x-y=-11$

$3x-(-1)=-11$

$3x+1=-11$

$3x=-12$

$x=-4$

$(-4,-1)$

EXAMPLE #4: What if none of the coefficients are the same???

$x + 12y = 9$ ①
$-2x - 6y = 0$

① x 2 $2x + 24y = 18$
$-2x - 6y = 0$

$18y = 18$
$y = 1$

$-2x - 6y = 0$
$-2x - 6(1) = 0$
$-2x - 6 = 0$
$\frac{-2x}{-2} = \frac{6}{-2}$
$x = -3$

$(-3, 1)$

Example #5 - Getting a common coefficient

$2x + 4y = -8$ ① x 5 $10x + 20y = -40$
$-5x + 3y = 7$ ② x 2 $-10x + 6y = 14$

$26y = -26$
$y = -1$

$2x + 4y = -8$
$2x + 4(-1) = -8$
$2x - 4 = -8$
$\frac{2x}{2} = \frac{-4}{2}$
$x = -2$
$(-2, -1)$

PRACTICE PROBLEMS...

Worksheet - Solve by Elimination.pdf

Do #1 - 12

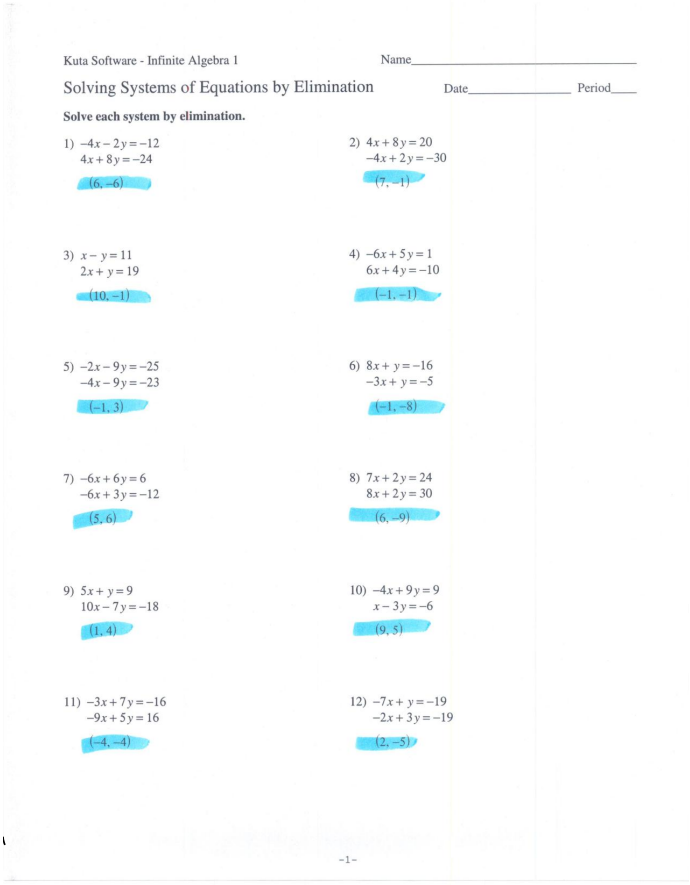
#3. $x - y = 11$
$2x + y = 19$

$3x = 30$
$x = 10$

$2x + y = 19$
$2(10) + y = 19$
$20 + y = 19$
$y = -1$

$(10, -1)$

Solutions...



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Solving Systems of Equations by Elimination Date_____ Period____

Solve each system by elimination.

1) $-4x - 2y = -12$
$4x + 8y = -24$
(6, −6)

2) $4x + 8y = 20$
$-4x + 2y = -30$
(7, −1)

3) $x - y = 11$
$2x + y = 19$
(10, −1)

4) $-6x + 5y = 1$
$6x + 4y = -10$
(−1, −1)

5) $-2x - 9y = -25$
$-4x - 9y = -23$
(−1, 3)

6) $8x + y = -16$
$-3x + y = -5$
(−1, −8)

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

8) $7x + 2y = 24$
$8x + 2y = 30$
(6, −9)

9) $5x + y = 9$
$10x - 7y = -18$
(1, 4)

10) $-4x + 9y = 9$
$x - 3y = -6$
(9, 5)

11) $-3x + 7y = -16$
$-9x + 5y = 16$
(−4, −4)

12) $-7x + y = -19$
$-2x + 3y = -19$
(2, −5)

-1-

13) $16x - 10y = 10$
$-8x - 6y = 6$
(0, −1)

14) $8x + 14y = 4$
$-6x - 7y = -10$
(4, −2)

15) $-4x - 15y = -17$
$-x + 5y = -13$
(8, −1)

16) $-x - 7y = 14$
$-4x - 14y = 28$
(0, −2)

17) $-7x - 8y = 9$
$-4x + 9y = -22$
(1, −2)

18) $5x + 4y = -30$
$3x - 9y = -18$
(−6, 0)

19) $-4x - 2y = 14$
$-10x + 7y = -25$
(−1, −5)

20) $3x - 2y = 2$
$5x - 5y = 10$
(−2, −4)

21) $5x + 4y = -14$
$3x + 6y = 6$
(−6, 4)

22) $2x + 8y = 6$
$-5x - 20y = -15$
Infinite number of solutions

23) $-14 = -20y - 7x$
$10y + 4 = 2x$
(2, 0)

24) $3 + 2x - y = 0$
$-3 - 7y = 10x$
(−1, 1)

Attachments

Worksheet - Solve by Elimination.pdf