Systems of Equations- Elimination Method

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AIM: I can solve a system of equation algebraically using *elimination.*

Warm Up: What is the solution to the following systems?

(a)

x	$y = 2x - 1$	$y = x + 2$
-5	-11	-3
-3	-7	-1
0	-1	2
3	5	5
5	9	7
7	13	9

Solution: (3, 5)

(b)

x	$y = 5x - 1$	$y = 5x + 2$
-3	-16	-13
-2	-11	-8
-1	-6	-3
0	-1	2
1	4	7
2	9	12

Solution: No solution

Solving a System of Equations by Elimination

1. Line up like terms for all equations
2. Look for opposite coefficients (like $3x$ and $-3x$) that will **eliminate** a variable. If you can't find one, you can make one by multiplying an equation by a number.
3. ADD each set of line terms to eliminate a variable, solve the remaining equation for the other variable.
4. Use your new found value to substitute and solve for the other missing variable.
5. Write the solution as an ordered pair (x, y).

Coordinate.

Exercise 1- Solve the following system:

$$\begin{aligned} 2x - 9y &= 17 \\ 5x + 9y &= 11 \end{aligned}$$

$7x = 28$

$\frac{7x}{7} = \frac{28}{7}$

$x = 4$

$5(x) + 9y = 11$

$5(4) + 9y = 11$

$20 + 9y = 11$

$-20 \quad -20$

$9y = -9$

$\frac{9y}{9} = \frac{-9}{9}$

$y = -1$

Solution $(4, -1)$

Exercise 2- Solve the following system of equations: $\begin{cases} 3y + x = 4 \\ y - 2x = 6 \end{cases}$

$3y + x = 4$

$-3(y - 2x = 6)$

$3y + x = 4$

$-3y + 6x = -18$

$7x = -14$

$\frac{7x}{7} = \frac{-14}{7}$

$x = -2$

$3y + x = 4$

$3y - 2 = 4$

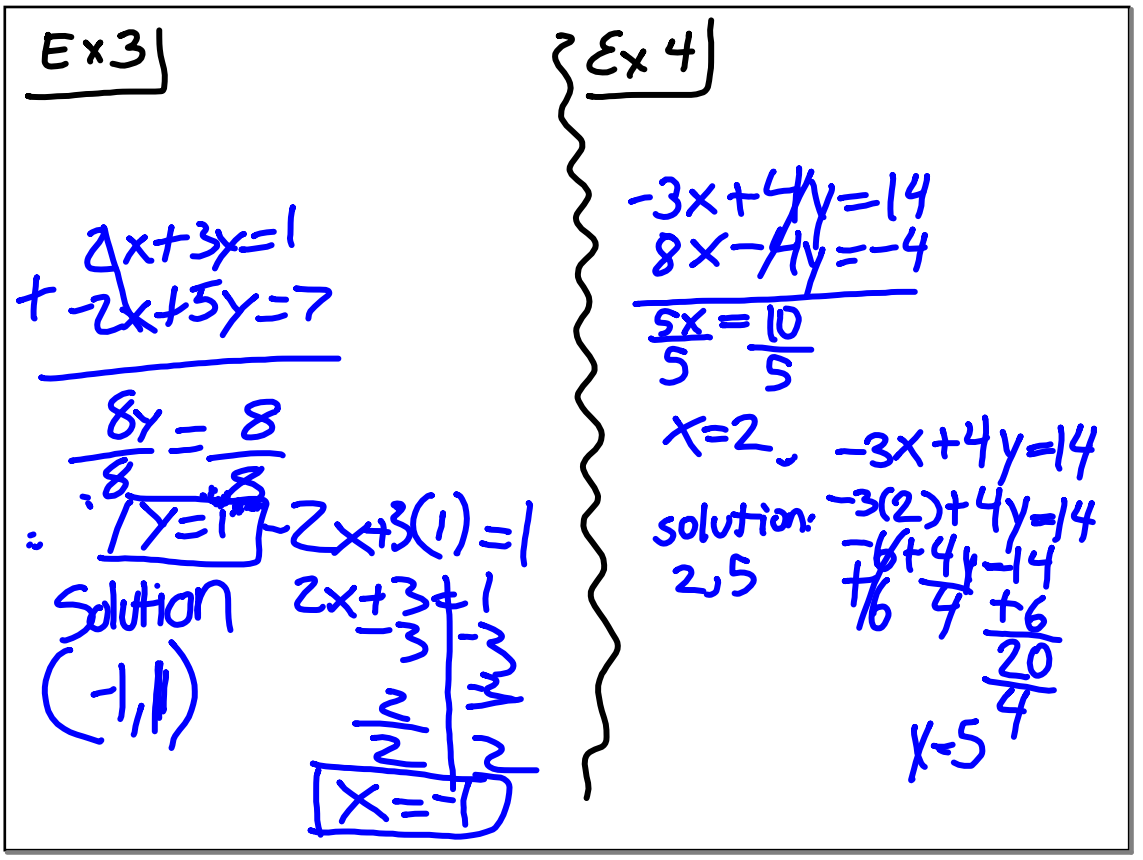
$+2 \quad +2$

$3y = 6$

$\frac{3y}{3} = \frac{6}{3}$

$y = 2$

Solution $(-2, 2)$


Ex 3
2x+3y=1
+ -2x+5y=7
8y = 8
8 8
y=1
2x+3(1)=1
2x+3=1
-3 -3
2x = -2
2 2
x=-1
Solution
(-1,1)
Ex 4
-3x+4y=14
8x-4y=-4
5x = 10
5 5
x=2
solution:
2,5
-3x+4y=14
-3(2)+4y=14
-6+4y=14
+6 +6
4y = 20
4 4
y=5