

Tuesday, February 18, 2020

$$\begin{array}{r} 2x + 3y = 20 \\ + -2x + y = 4 \\ \hline 0 + 4y = 24 \\ 4y = 24 \\ \text{\textcircled{y} = 6} \end{array}$$

1.6 Solving a Linear System Using Algebra - Elimination

When the coefficients of the same variable in both equations have the same (or opposite) value, you can eliminate that variable by subtracting (or adding) the two equations. You need to be sure that like terms are lined up before you add or subtract!

ex 1/ Add.

$$\begin{array}{r} x + y = 4 \\ \underline{2x - y = 5} \end{array}$$

ex 2/ Subtract.

$$\begin{array}{r} 3x - 4y = 7 \\ \underline{3x + 2y = 1} \end{array}$$

If the coefficients are not the same, you can make them the same by multiplying

ex 3/ $-2x - y = 4$

$$\underline{3x + 2y =}$$

ex 4/ $2x + 4y = 6$

$$\underline{x - y = 4}$$

$$\begin{array}{r} 2x + 3y = 20 \\ -2x + y = 4 \\ \uparrow \end{array}$$

Steps to Solve with Elimination:

Example: Solve using elimination.

$$\begin{aligned}2x + y &= 3 \\3x + 2y - 5 &= 0\end{aligned}$$

Practice Problems:

Solve using elimination.

1)
$$\begin{aligned}2y &= -3x + 13 \\-2x + 4y - 2 &= 0\end{aligned}$$

2)
$$\begin{aligned}\frac{1}{2}x + \frac{1}{3}y &= \frac{5}{6} \\ \frac{1}{2}y + \frac{3}{4}x &= \frac{5}{4}\end{aligned}$$

3) Find the point of intersection of the graphs defined by the linear system provided below.

$$\begin{aligned}3(x + 3) - 4y + 13 &= 0 \\x + 4(y - 3) &= 0\end{aligned}$$

4) Given the systems of equations below, determine if substitution or elimination is a more appropriate method of solving. Solve using the method that you choose.

a)
$$\begin{aligned}4x - 2y &= 5 \\x - 2y &= 2\end{aligned}$$

b)
$$\begin{aligned}y &= 3x - 5 \\2x - 3y &= 7\end{aligned}$$

