System of Equations Walkthrough

Elimination Method

$$\begin{cases} -2x+y=4 \\ 2x+3y=20 \end{cases}$$

In this example, we will be using the elimination method to solve a system of equations. By solving a system of equations, we discover where two lines would intersect on a graph.

The Elimination method is best used when two variables have the same absolute value but have different signs (for example, -5 and 5). In our example $-2x$ and $2x$ fit this requirement. We must add the two equations together to use this method.

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

Then we isolate the remaining variable by dividing by the coefficient.

$$\frac{4y}{4}=\frac{24}{4}$$

$$y=6$$

Now, we find the x-coordinate by plugging the y-value back into the original equations.

$-2x+6=4$

$-2x+6=4$
$\quad -6 \quad -6$

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

$$x=1$$

$2x+3(6)=20$

$2x+18=20$
$\quad -18 \quad -18$

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

$$x=1$$

Then ~~you~~ we solve for x.

Do any multiplication that the input needed.

Isolate variable and coefficient.

Divide by coefficient to finish isolation of variable

Write answer in coordinate format:

(x, y)

$(1, 6)$