

Solution of two simultaneous equations. The problem is to find the set of all solutions that satisfies both equations. These are called simultaneous equations.

$$\begin{cases} 3x + 4y = 10 \\ 2x + y = 5 \end{cases}$$

both sides of second equation are multiplied by 4

$$\begin{cases} 3x + 4y = 10 \\ 8x + 4y = 20 \end{cases}$$

The first equation is subtracted from second

$$\begin{cases} 3x + 4y = 10 \\ 5x = 10 \end{cases}$$

$\div 5$

$$\begin{cases} 3(2) + 4y = 10 \\ x = 2 \end{cases}$$

As a result, $x = 2$, this value is then substituted in the first equation

$$\begin{cases} 3(2) + 4y = 10 \\ x = 2 \end{cases}$$

6 is subtracted from both sides

$$\begin{cases} 4y = 10 - 6 \\ x = 2 \end{cases}$$

$\div 4$

$$\begin{cases} y = 1 \\ x = 2 \end{cases}$$

The solution is $\{(x = 2 ; y = 1)\}$