

July 09, 2018

Algebra

Solving Linear Equations by substitution method

This method is applied when at least one equation gives the value of one unknown in terms of the other.

Examples:

1. Solve the system
$$\begin{cases} 3x + 2y = 11 & (1) \\ y = 4x & (2) \end{cases}$$

Solution:

Substitute $4x$ for y in equation 1

$$= 3x + 2(4x) = 11$$

$$= 3x + 8x = 11$$

$$\frac{11x}{11} = \frac{11}{11}$$

$$x = 1$$

Substitute $x = 1$ for x in equation 2

$$y = 4x$$

$$y = 4(1)$$

$$y = 4$$

Therefore the solution is the ordered pair $(1, 4)$

To know if the solution is correct we will check using the system

$$\begin{cases} 3x + 2y = 11 \\ y = 4x \end{cases}$$

We will substitute the $(1, 4)$ in the equations

$$3x + 2y = 11$$

$$3(1) + 2(4) = 11$$

$$3 + 8 = 11$$

$$11 = 11$$

$$y = 4x$$

$$4 = 4(1)$$

$$4 = 4$$