

Use Substitution to Solve Systems of Equations

Study the example showing how to use substitution to solve a system of equations. Then solve problems 1–6.

Example

Solve the system of equations.

$$y = x - 3 \quad y + 2x = 3$$

Notice that the first equation tells you that $y = x - 3$, so substitute $x - 3$ for y in the second equation and solve for x .

$$\begin{aligned} y + 2x &= 3 \\ (x - 3) + 2x &= 3 \\ 3x - 3 &= 3 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

Now that you know the value of x , you can find the value of y . Substitute 2 for x in either equation and solve for y .

$$\begin{aligned} y &= x - 3 \\ y &= 2 - 3 \\ y &= -1 \end{aligned}$$

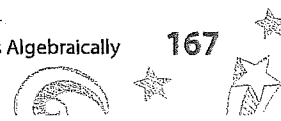
The solution is $(2, -1)$.

- 1** Substitute the value of x in the example into the second equation, $y + 2x = 3$. What value do you get for y ? Is it the same solution as in the example problem?

- 2** The solution in the example is $(2, -1)$. Explain what the graph of the system looks like.

- 3** Look at the system of equations below. Describe how you can use substitution to find the solution. Then find the solution.

$$y - 3x = 4 \quad y = x - 4$$



Solve.

- 4** Use substitution to solve the system of equations.

$$y + x = 3$$

$$y = 1.5x + 1$$

Show your work.

Solution: _____

- 5** The system of equations at the right shows x by itself on the left side of one equation. Solve the system by substituting for x instead of for y .

$$\begin{aligned}x &= -y - 2 \\ 0.5x + y &= 1\end{aligned}$$

Show your work.

Solution: _____

- 6** Fina wants to use substitution to solve the system of equations at the right. Explain what she needs to do first before using substitution. Then solve the system of equations.

$$\begin{aligned}2x - y &= 3 \\ -1.5x + 3y &= -18\end{aligned}$$

Group work : Together with your group complete the two examples

x	y
0	10
1	6
2	2
3	-2
4	-6

Find the slope by choosing two points from the table:

The "b" or y-intercept is _____.

The equation of the line displayed in the table above is: $y =$ _____.

x	y
2	15
1	10
0	5
4	25
3	20

Find the slope by choosing two points from the table:

The "b" or y-intercept is _____.

The equation of the line displayed in the table above is: $y =$ _____.

ON YOUR OWN

Can you write an equation given this set of points?

$(0, 16), (1, 17.50), (2, 19)$

The "b" or y-intercept is _____.

Find the slope:

The equation of the line displayed in the table above is _____.

