

Solving Systems Example No. 1

Solve the system of equations below.

$$\begin{cases} y = 4x - 12 \\ y = x + 3 \end{cases}$$

Step 1. For each equation above, the right side equals y . So they're equal!

$$4x - 12 = x + 3$$

Step 2. Gather all the x 's on one side of the equation.

$$\begin{array}{r} 4x - 12 = x + 3 \\ -x \quad -x \end{array}$$

$$3x - 12 = 3$$

Step 3. Gather all the non-variables on the other side and divide to solve.

$$\begin{array}{r} 3x - 12 = 3 \\ +12 \quad +12 \end{array}$$

$$\begin{array}{r} 3x = 15 \\ \div 3 \quad \div 3 \end{array}$$

$$x = 5$$

Step 4. Plug your value for x into the first equation to solve for y .

$$\begin{array}{l} y = 4x - 12 \\ y = 4(5) - 12 \\ y = 20 - 12 \\ y = 8 \end{array}$$

Step 5. Make sure your values for x and y work in the second equation.

$$\begin{array}{l} y = x + 3 \\ 8 = 5 + 3 \end{array}$$

$$8 = 8$$

☺ Since $x = 5$ and $y = 8$ work for both equations, we know we got it right! ☺