

General Equation - Part II

Objective A: to solve unknown number (x) from equation of the form $ax + b = cx + d$. Note: In this form, a, b, c, and d represent known numbers.

Steps to solve for x in the equation $2x + 3 = 5x - 9$

First step: Removing $5x$ to left hand side by subtracting $5x$ from each side of the equation because your ultimate goal is to get an answer for x (ultimate form of solution is variable $x =$ one specific number).

$$\text{Ex: } 2x + 3 - 5x = 5x - 9 - 5x$$

Second step: simplifying equation in first step. You get:

$$-3x + 3 = -9$$

Third step: Isolating the variable term by subtracting 3 from each side of the equation. You get:

$$-3x + 3 - 3 = -9 - 3$$

Fourth step: Simplifying the equation in the third step. You get:

$$-3x = -12$$

Fifth step: As you have seen in fourth step, you need to end with x rather than $-3x$ (note: $1x = x$). To do this divide the coefficient of x (in this example, -3) from each side of equation:

$$\frac{-3x}{-3} = \frac{-12}{-3}$$

Sixth step: Simplify the equation in the fifth step. Your final answer:

$$x = 4$$

Checking: The solution is 4. You should verify this by checking this solution.

Objective B: To solve for x in an equation containing groupings.

Steps for example: $4 + 5(2x - 3) = 3(4x - 1)$

First step: Use the Distribution Property to expand the equation. Then simply. You get:

$$4 + 10x - 15 = 12x - 3 \text{ (distribution)}$$

$$10x - 11 = 12x - 3 \text{ (simply)}$$

Second step: Remove 12x by subtracting 12x from each side of the equation. Your ultimate goal is to get an answer for x in the form of $x =$ one specific number).

$$10x - 11 - 12x = 12x - 12x - 3$$

Third step: Simplifying the equation in the second step, you get:

$$-2x - 11 = -3$$

Fourth step: Remove the constant - 11 to the right hand side by adding +11 to each side of the equation. You get:

$$-2x - 11 + 11 = -3 + 11$$

Fifth step: Simplifying the equation in fourth step, you get:

$$- 2x = 8$$

Sixth step: Divide the coefficient of x (in this example, -2) from each side of equation:

$$\frac{-2x}{-2} = \frac{8}{-2}$$

Seventh step: Simplify the equation in the sixth step. You get your final answer:

$$x = - 4$$

Checking: The solution is -4. You should verify this by checking this solution.