

CHAPTER 4 Equations

4.2 Solve Multi-Step Equations

Solving an Equation Involving Multiple Terms and Checking

Example:

a) Solve the equation $5x + 3 = 2x - 6$.

b) Solve the equation $4y - 5 = -2y + 7$. Check your solution.

Solution:

$$\begin{aligned} \text{a)} \quad & 5x + 3 = 2x - 6 \\ & 5x + 3 - 2x = 2x - 6 - 2x \\ & 3x + 3 = -6 \\ & 3x + 3 - 3 = -6 - 3 \\ & 3x = -9 \\ & \frac{3x}{3} = \frac{-9}{3} \\ & x = -3 \end{aligned}$$

The solution is $x = -3$.

$$\begin{aligned} \text{b)} \quad & 4y - 5 = -2y + 7 \\ & 4y - 5 + 2y + 5 = -2y + 7 + 2y + 5 \\ & 6y = 12 \\ & \frac{6y}{6} = \frac{12}{6} \\ & y = 2 \end{aligned}$$

Check: Substitute $y = 2$.

$$\begin{array}{ll} \text{L.S.} = 4y - 5 & \text{R.S.} = -2y + 7 \\ = 4(2) - 5 & = -2(2) + 7 \\ = 8 - 5 & = -4 + 7 \\ = 3 & = 3 \end{array}$$

$$\text{L.S.} = \text{R.S.}$$

Therefore, $y = 2$ is the correct solution.

Practice:

1. Solve: $3x - 5 = x - 3$.

2. Solve and check: $7y + 13 = -3y - 7$.

Answers:

1. $x = 1$ 2. $y = -2$