

Variables on Both Sides

7th Grade

Collect the letters on one side and the numbers on the other.

Get all the variable terms onto one side and all the constants onto the other, then solve as a two-step equation.

$$5x + 2 = 3x + 10$$

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$$x = 4$$

Subtract $3x \rightarrow 2x + 2 = 10$.

$$7 - 2x = x + 1$$

$$x = 2$$

Add $2x \rightarrow 7 = 3x + 1$.

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

$$x = 3$$

Expand first: $2x + 6 = 4x$.

No solution case

$$3x + 1 = 3x + 5$$

The x cancels and $1 = 5$ is false. No solution.

If everything cancels and you get a true statement like $5 = 5$, every number works.