

Solving Equations

7th Grade

One-step to multi-step equations and inequalities, solved in order.

THE BALANCE RULE

Whatever you do to one side, do to the other.

Undo in reverse order of operations: + and – first, then $\times$ and $\div$.

ONE STEP

subtract 7 from both sides

$$x + 7 = 12$$

$$x = 12 - 7 = 5$$

TWO STEP

add 4, then divide by 3

$$3x - 4 = 11$$

$$3x = 15 \rightarrow x = 5$$

VARIABLES BOTH SIDES

collect variables on one side

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

$$2x = 8 \rightarrow x = 4$$

DISTRIBUTIVE

expand the bracket first

$$2(x + 3) = 14$$

$$2x + 6 = 14 \rightarrow x = 4$$

FRACTIONS

multiply everything by the denominator

$$x/4 + 1 = 6$$

$$x/4 = 5 \rightarrow x = 20$$

INEQUALITIES

Multiply or divide by a negative $\rightarrow$ flip the sign.

$-2x > 8 \rightarrow x < -4$. Everything else works exactly like an equation.

ALWAYS CHECK Put your answer back into the original equation. Both sides must match.