

# LINEAR EQUATIONS

## == STEP CARDS ==



### 1 READ IT

Read the equation carefully. Identify the variable and what is being asked.



$$3x + 5 = 11$$

### 2 REMOVE BRACKETS

If there are brackets, multiply to remove them first.

Example:

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

$$2x + 6 = 14$$

### 3 COLLECT LIKE TERMS

Simplify each side of the equation by collecting like terms.

Example:

$$3x + 5x - 4 = 2x + 6$$

$$8x - 4 = 2x + 6$$

### 4 ISOLATE THE VARIABLE TERM

Use addition or subtraction to move all constant terms to the other side. Keep the variable terms on one side.

Example:

$$8x - 4 = 2x + 6$$

$$8x - 2x = 6 + 4$$



### 5 SIMPLIFY AGAIN

Simplify both sides of the equation.

Example:

$$8x - 2x = 6 + 4$$

$$6x = 10$$



### 6 ISOLATE THE VARIABLE

Use multiplication or division to get the variable by itself.

Example:

$$6x = 10$$

$$x = \frac{10}{6}$$



### 7 SIMPLIFY THE SOLUTION

Simplify your answer as much as possible.

Example:

$$x = \frac{10}{6}$$

$$x = \frac{5}{3}$$



### 8 CHECK YOUR SOLUTION

Substitute your answer back into the original equation.

If both sides are equal, your solution is correct.

$$\text{LHS} = \text{RHS}$$

### 9 ONE STEP EQUATIONS

Only one operation to solve.

Example:

$$4x = 20$$

$$x = 5$$



### 10 TWO STEP EQUATIONS

Two operations to solve. Do the opposite operations in reverse order.

Example:

$$2x + 3 = 11$$

$$x = 4$$



### 11 NO SOLUTION (CONTRADICTION)

Simplifies to a false statement.

Example:

$$2x + 5 = 2x + 9$$

$$0 = 4 \rightarrow \text{No solution}$$



### 12 INFINITE SOLUTIONS

Simplifies to a true statement.

Example:

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

$$0 = 0 \rightarrow \text{Infinitely many solutions}$$



#### KEY VOCABULARY

#### EQUATION

A statement that two expressions are equal.

#### TERM

A number, variable or product of a number and a variable.

#### LIKE TERMS

Terms with the same variable raised to the same power.

#### CONSTANT

A fixed number with no variable.

#### SOLUTION

The value of the variable that makes the equation true.