



# How to Solve Equations and Find Missing Numbers

KS3 Ages 11-14 ⌚ 3 min read

## What is an Equation?

An **equation** is like a puzzle where you need to find a missing number. It's a statement that says two things are equal. For example,  $x + 5 = 12$  means "some number plus 5 equals 12"—and your job is to work out what that number is.

The letter **x** (or any letter) stands for the missing number we need to find. This missing number is called the **unknown**.

Think of it like a seesaw at the playground. When both sides are balanced, they weigh the same. An equation works the same way—both sides of the equals sign must stay balanced.

## The Golden Rule: Keep Both Sides Equal

The most important rule in solving equations is this: whatever you do to one side of the equation, you must do to the other side. This keeps everything balanced.

If we have  $x + 5 = 12$ , we need to get **x** on its own. To do this, we remove the **5** from the left side. But if we take away **5** from the left, we must also take away **5** from the right to keep it balanced:

$$x + 5 - 5 = 12 - 5$$

This simplifies to  $x = 7$ .

Think of it like sharing sweets between two friends. If one person loses **5** sweets, the other person must lose **5** sweets too, so it stays fair.

## Steps to Solve Any Equation

**Step 1:** Identify what you need to get rid of on the side with the **x**.

**Step 2:** Do the opposite operation. If you're adding, subtract. If you're subtracting, add. If you're multiplying, divide. If you're dividing, multiply.

**Step 3:** Do that same operation to both sides of the equation.

**Step 4:** Simplify until **x** stands alone.

**Step 5:** Check your answer by putting the number back into the original equation.

Think of it like unwrapping a present. If something is added around your answer, you peel it away. If something is multiplied around it, you divide it away.

## A Quick Example

Let's solve  $3x = 15$ .

Here, **x** is being multiplied by **3**. To undo multiplication, we divide both sides by **3**:

$$3x \div 3 = 15 \div 3$$

This gives us  $x = 5$ .

To check:  $3 \times 5 = 15$  ✓ Correct!

Once you practise these steps, solving equations becomes a satisfying puzzle where you're in control of finding the answer.