Explain Like I'm 10

Reflection and Rotation: Two Ways to Transform Shapes

KS4 MATHEMATICS GEOMETRY TRANSFORMATIONS Ages 11-14 ⏰ 3 min read

What Are Reflections and Rotations?

In mathematics, a **transformation** is when you change the position or direction of a shape without changing its size or what it looks like. Two of the most important transformations are **reflections** and **rotations**. Both move shapes around, but they do it in completely different ways.

What Is a Reflection?

A **reflection** is like creating a mirror image of a shape. When you reflect a shape, you flip it across a line called a **mirror line** (or **line of symmetry**). The shape ends up on the opposite side of the line, and it looks like it's been flipped.

Imagine you draw a triangle on one side of a piece of paper, then fold the paper in half. The crease is your mirror line. When you unfold it, the triangle's reflection appears on the other side, facing the opposite direction.

Think of it like: looking in a bathroom mirror. Your reflection is the same size and shape as you, but it's flipped—your left hand becomes your right hand in the mirror.

What Is a Rotation?

A **rotation** is when you spin a shape around a fixed point, called the **centre of rotation**. The shape turns like a wheel spinning around an axle. You need **3 things** to describe a rotation: the centre point, the direction (clockwise or anticlockwise), and the **angle** (how many degrees it turns).

Common rotations are **90 degrees**, **180 degrees**, and **270 degrees**. A **360-degree** rotation brings the shape all the way around to where it started.

Think of it like: spinning a pizza plate on your finger. The pizza doesn't flip over—it just turns around the centre point until it faces a new direction.

Key Differences

The easiest way to remember the difference: **reflections flip shapes across a line**, while **rotations spin shapes around a point**. When you reflect a shape, it reverses —like a mirror image. When you rotate a shape, it just turns, staying exactly the same but facing a different direction. Both transformations keep the shape's size and angles the same—they only change where the shape is.