How to Draw a Quadratic Function Graph

KS4 MATHEMATICS | ALGEBRA | GRAPHING | Ages 14-16 | ⏰ 4 min read

What Is a Quadratic Function?

A **quadratic function** is a type of mathematical equation that always contains an **x squared** (written as x^2) term. The general form is $y = ax^2 + bx + c$. When you draw the graph of a quadratic function, you get a beautiful U-shaped or upside-down U-shaped curve called a **parabola**.

Think of it like a ball thrown in the air. The path the ball takes through the air is a parabola—it goes up, reaches a peak, then comes back down.

Step 1: Find the Line of Symmetry

Every parabola has a vertical line running down its middle called the **line of symmetry**. You can find it using the formula: $x = -b \div 2a$. This tells you where the parabola's centre line is positioned on your graph.

Step 2: Find the Turning Point (Vertex)

The **turning point**, or **vertex**, is where the parabola reaches its highest or lowest point. Substitute your x-value from the line of symmetry back into the original equation to find the y-value. Now you have coordinates for the turning point!

Think of it like finding the peak of a mountain (or bottom of a valley)—this is the most important point on your curve.

Step 3: Find Key Points

Choose at least **5 points** on either side of the line of symmetry. Pick simple x-values (like −2, −1, 0, 1, 2) and substitute each into your equation to calculate the corresponding y-values. Write these as coordinates (x, y) on a table.

Step 4: Plot Your Points

On **graph paper**, mark each point you've calculated. Use a pencil so you can make corrections. Remember that parabolas are symmetrical—if you have a point on one

side, its mirror image should appear on the other side.

Step 5: Draw the Smooth Curve

Connect your plotted points with a **smooth, curved line**—not straight lines! Your parabola should flow gently, passing through all your points. Make sure both ends of your curve point upwards (if a is positive) or downwards (if a is negative).

Think of it like joining dots with a piece of string that naturally curves—your pencil should follow that smooth path.

Top Tips for Success

Always use **graph paper** for accuracy. Check that your curve is symmetrical by folding your paper along the line of symmetry. The turning point should be at the highest or lowest part of the curve. Plot extra points if your curve looks bumpy or uneven.