Parabola factorised form (a=1 only)

Factorised Form ($a = 1$)

Key idea

With $a = 1$: $y = (x-p)(x-q)$. The roots are $x = p$ and $x = q$. The axis of symmetry is the midpoint of p and q.

Reading roots and axis

For $y = (x-2)(x-6)$: roots 2 and 6. Axis: $x = \dfrac{2+6}{2} = 4$.

Finding the turning point

Same parabola, at $x = 4$: $y = (4-2)(4-6) = 2(-2) = -4$. Turning point $(4, -4)$.

Common mistake

Read the bracket signs carefully. In $y = (x+2)(x-5)$, the roots are -2 and 5, not 2 and -5.

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Building the Equation from Roots

From two roots

Roots 1 and 8: each bracket is zero at that root, so $y = (x - 1)(x - 8)$.

Repeated root

Touches the x-axis once, at $x = 3$: $y = (x-3)^2$. Both roots equal, so the axis is also $x = 3$.

Common mistake

The turning point isn't always on the x-axis just because the roots are – it usually sits above or below.

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