JCHL Algebra 15 — Sketching Quadratic Curves

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How to use this worksheet: these are the exact questions worked in this tutorial, in order. Try each one yourself first — the time it is posed in the video is shown, so you can pause before Paul solves it. Final answers are at the back; the full method is in the video.

Worked examples (in the video)

Example 1. Sketch $x^2 + 7x + 12 = 0$ (factorise for the roots; constant = y-crossing; sign of x^2 = shape). *(worked 00:19–09:03)*.

Example 2. Sketch $-2x^2 + 5x + 3 = 0$ (flip the sign to factorise; shape and y-intercept come from the ORIGINAL). *(worked 09:58–17:36)*.

Example 3. Sketch $x^2 + 3x = 0$ (no constant). *(worked 17:45–22:00)*.

Questions

(a). Sketch $x^2 + 6x + 8 = 0$.

Posed at 22:44 in the tutorial.

(b). Sketch $-x^2 - 8x + 9 = 0$.

Posed at 23:55 in the tutorial.

(c). Sketch $2x^2 + 9x = 0$.

Posed at 25:22 in the tutorial.

(d). Sketch $x^2 + 6x + 9 = 0$ (equal roots).

Posed at 28:04 in the tutorial.

Answers

You can find the final answers to these questions below — pause the video and check yourself; the worked method is in the tutorial.

Example 1. Roots -4 and -3; y-axis at 12; $+x^2$ → U-shape

Example 2. Roots $-\frac{1}{2}$ and 3; y-axis at 3; $-x^2$ → n-shape

Example 3. $x(x+3) = 0$ → roots 0 and -3; U-shape through the origin

(a). $(x+2)(x+4)$ → roots -2, -4; y-axis 8; U-shape

(b). Flip → $(x-1)(x+9)$ → roots 1, -9; y-axis 9; n-shape (original $-x^2$)

(c). $x(2x+9)$ → roots 0, $-\frac{9}{2}$; U-shape through the origin

(d). $(x+3)(x+3)$ → touches the x-axis at -3; y-axis 9; U-shape

Overlaps with these tutorials

Builds on: Algebra 13 (solving by factorising).

Next: Algebra 16 — Generate the Quadratic Equation (working backwards from the roots).