

# LCOL Algebra 16 — Sketching Quadratic Curves

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**ON THE LCOL PAST PAPERS · Examined in 1 question-part, 2015 (main sitting) | 2015: P1 Q4(c)**

**How to use this sheet:** 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

*Final answers only — pause the video and check yourself; the worked method is in the tutorial.*

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

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

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

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

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

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

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

## Overlaps with these tutorials

**LCOL Algebra 11-14 (factorising and solving quadratics).** You must be able to do both before sketching — do them first.

**LCOL Algebra 17 — Generating Quadratic Equations.** The same roots/shape/y-intercept facts, used in the forward direction. Comes next.