

Algebra 11 — Solving Cubic Equations

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ON THE LCHL PAST PAPERS · 2025 P1 Q1(c) (main sitting, 10 marks) · 2024 P1 Q6(a) (main sitting, 10 marks) · 2024 P1 Q7(b)(i) (deferred, 20 marks) · 2024 P1 Q7(b)(ii) (deferred, 20 marks) · 2023 P1 Q4(b)(i) (deferred, 5 marks) · 2023 P1 Q4(b)(ii) (deferred, 15 marks) · 2022 P1 Q1(c)(i) (main sitting) · 2022 P1 Q3(b) (deferred, 10 marks) · 2022 P1 Q5(b)(i) (main sitting, 15 marks) · 2022 P1 Q8(c)(i) (deferred, 5 marks) · 2021 P1 Q2(b) (main sitting, 20 marks) · 2020 P1 Q1(a)(i) (main sitting, 10 marks) · 2019 P1 Q4(b)(ii) (main sitting, 10 marks) · 2018 P1 Q2(b) (main sitting, 10 marks) · 2017 P1 Q5(a) (main sitting, 15 marks) · 2015 P1 Q2 (main sitting, 25 marks)

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. Solve $x^3 + 3x^2 - 46x - 48 = 0$ (worked 00:48–09:54).

Questions

Q1.i. Solve $2x^3 + x^2 - 13x + 6 = 0$

Posed at 10:13 in the tutorial.

Q1.ii. Solve $x^3 - 4x^2 - x + 4 = 0$

Posed at 10:13 in the tutorial.

Q1.iii. Solve $2x^3 + 7x^2 + 7x + 2 = 0$

Posed at 10:13 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. $x = -8, x = -1, x = 6$

Q1.i. $x = 2, x = \frac{1}{2}, x = -3$

Q1.ii. $x = 1, x = 4, x = -1$

Q1.iii. $x = -1, x = -\frac{1}{2}, x = -2$

Overlaps with these tutorials

Algebra 13 — Long Division. The dedicated deep-dive on this video's hardest step. Do Algebra 11 first.

Algebra 2 — Factorising Quadratics. The second half of every cubic solve.

Algebra 12 — Nature of Cubic Roots. Same pipeline, but stops at the quadratic and tests its discriminant instead of solving.