

Algebra 17 — Surd Equations

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ON THE LCHL PAST PAPERS · 2025 P1 Q1(b) (main sitting, 10 marks) · 2025 P1 Q8(e)(i) (main sitting, 7 marks) · 2025 P1 Q8(e)(ii) (main sitting, 7 marks) · 2024 P1 Q1(a) (main sitting, 10 marks) · 2024 P1 Q10(c)(i) (main sitting, 8 marks)

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. $\sqrt{3x - 5} + 1 = x$ — single surd (worked 00:22–03:55).

Example 2. $\sqrt{3x - 2} = \sqrt{x - 2} + 2$ — two surds (worked 04:01–08:48).

Questions

Q1. Solve for x : $\sqrt{2 - 7x} + 2x = 0$

Posed at 08:53 in the tutorial.

Q2. Solve for x : $\sqrt{5x + 1} + \sqrt{x + 1} = 6$

Posed at 08:53 in the tutorial.

Answers

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

Example 1. $x = 3$ or $x = 2$ — both verify

Example 2. $x = 6$ or $x = 2$ — both verify

Q1. $x = -2$ only ($x = \frac{1}{4}$ is extraneous: $\frac{1}{2} + \frac{1}{2} = 1 \neq 0$)

Q2. $x = 3$ only ($x = 24$ is extraneous: $\sqrt{121} + \sqrt{25} = 11 + 5 = 16 \neq 6$)

Overlaps with these tutorials

Algebra 4 — JC Fractions. The surd arithmetic ($\sqrt{a} \times \sqrt{a} = a$, conjugates) this video runs on. Do Algebra 4 first.

Algebra 15 — Modulus Equations. Squaring away a modulus is the conceptually identical operation.

Algebra 2 — Factorising Quadratics. Every squared surd equation ends in one of these.