Algebra 15 — Modulus Equations

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ON THE LCHL PAST PAPERS · 2025 P1 Q1(a) (main sitting, 10 marks) · 2025 P1 Q10(c) (main sitting, 6 marks) · 2025 P1 Q1(b) (deferred, 10 marks) · 2023 P1 Q1(a) (main sitting, 10 marks) · 2023 P2 Q4(a)(ii) (main sitting, 10 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. Solve |x − 5| = 3, by splitting AND by squaring *(worked 02:14–07:38)*.

Example 2. |4x + 7| < 1 *(worked 07:38–12:00)*.

Questions

Q1. Solve $|3x - 2| = 19$

Posed at 12:13 in the tutorial.

Q2. Find range of x for which $|2x + 1| \geq 9$

Posed at 12:13 in the tutorial.

Q3. Solve $|x - 2| = |2x - 1|$ (modulus on **both sides**)

Posed at 12:13 in the tutorial.

Answers

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

Example 1. x = 2 or x = 8 (both methods agree)

Example 2. −2 < x < −3/2

Q1. $x = 7$ or $x = -\frac{17}{3}$

Q2. $x \leq -5$ or $x \geq 4$

Q3. $x = 1$ or $x = -1$

Overlaps with these tutorials

Algebra 6 — Inequalities. Squared modulus inequalities land exactly there — factor, sketch, read off. Do Algebra 6 first.

Algebra 17 — Surd Equations. Squaring to remove a modulus is the identical move to squaring to remove a surd.

Algebra 16 — Modulus Graphs. What these solutions look like on the coordinate plane.