

LCOL Algebra 21 — Simultaneous Equations By Substitution

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ON THE LCOL PAST PAPERS · Examined in 5 question-parts, 2017-2024 (main sittings) | 2024: P1 Q3(c) · 2021: P1 Q4(b) · 2020: P1 Q2(b) · 2019: P1 Q4(b) · 2017: P1 Q4(b)

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 $x + y = 7$ and $x^2 + y^2 = 25$. (worked 00:11-14:38).

Example 2. Solve $3x - y = 5$ and $2x^2 - 2y^2 + 14x = 8$. (worked 14:50-30:02).

Questions

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

Posed at 30:02 in the tutorial.

Q2. Solve $a + 2b + 1 = 0$ and $a^2 - ab + b^2 = 3$.

Posed at 30:02 in the tutorial.

Answers

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

Example 1. $x = 7 - y \rightarrow y^2 - 7y + 12 = 0 \rightarrow (3, 4)$ and $(4, 3)$

Example 2. $y = 3x - 5 \rightarrow 8x^2 - 37x + 29 = 0 \rightarrow (1, -2)$ and $(\frac{29}{8}, \frac{47}{8})$

Q1. $x = y - 3 \rightarrow y^2 - 4y + 3 = 0 \rightarrow (0, 3)$ and $(-2, 1)$

Q2. $a = -2b - 1 \rightarrow 7b^2 + 5b - 2 = 0 \rightarrow (1, -1)$ and $(-\frac{11}{7}, \frac{2}{7})$

Overlaps with these tutorials

LCOL Algebra 20 — Linear Simultaneous Equations. The elimination method for when there's no square — do that first.

LCOL Algebra 11 & 14 (factorising and solving quadratics). The middle of every substitution question is exactly that.