



Cambridge International AS & A Level

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MATHEMATICS**9709/32**

Paper 3 Pure Mathematics 3

May/June 2025**1 hour 50 minutes**

You must answer on the question paper.

You will need: List of formulae (MF19)

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

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[5]

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- [illegible]

- 3 On an Argand diagram shade the region whose points represent complex numbers z which satisfy both the inequalities $|z - 3i| \leq 2$ and $\frac{1}{4}\pi \leq \arg(z - 1 - 2i) \leq \frac{3}{4}\pi$. [5]

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- By first forming a quartic equation in x or y , find the square roots of $-1 - 4\sqrt{5}i$ in exact Cartesian form. [5]

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[2]

[2]

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- 7 (a) Express $7 \sin \theta + 24 \cos \theta$ in the form $R \cos(\theta - \alpha)$, where $R > 0$ and $0 < \alpha < \frac{1}{2}\pi$. Give the value of α correct to 4 decimal places. [3]

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[4]

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$$\sin 2\theta \frac{dx}{d\theta} = (4x + 3) \cos 2\theta,$$

and $x = 0$ when $\theta = \frac{1}{12}\pi$.

Solve the differential equation and obtain an expression for x in terms of θ .

[7]

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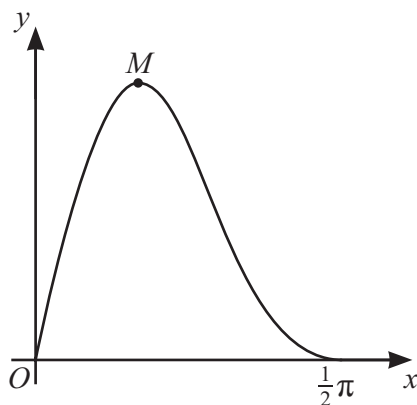
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[6]

[illegible]

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The diagram shows the graph of $y = 5 \sin 2x \cos^2 x$ for $0 \leq x \leq \frac{1}{2}\pi$ and its maximum point M .

- (a) Find the exact x -coordinate of M .

[6]

(a) Find the exact x -coordinate of M .





(b) By using the substitution $u = \cos x$, find the area of the region bounded by the curve, the x -axis between $x = 0$ and $x = \frac{1}{4}\pi$, and the line $x = \frac{1}{4}\pi$. [5]

[5]

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