



Cambridge International AS & A Level

CANDIDATE NAME



CENTRE NUMBER

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CANDIDATE NUMBER

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MATHEMATICS

9709/33

Paper 3 Pure Mathematics 3

October/November 2024

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.





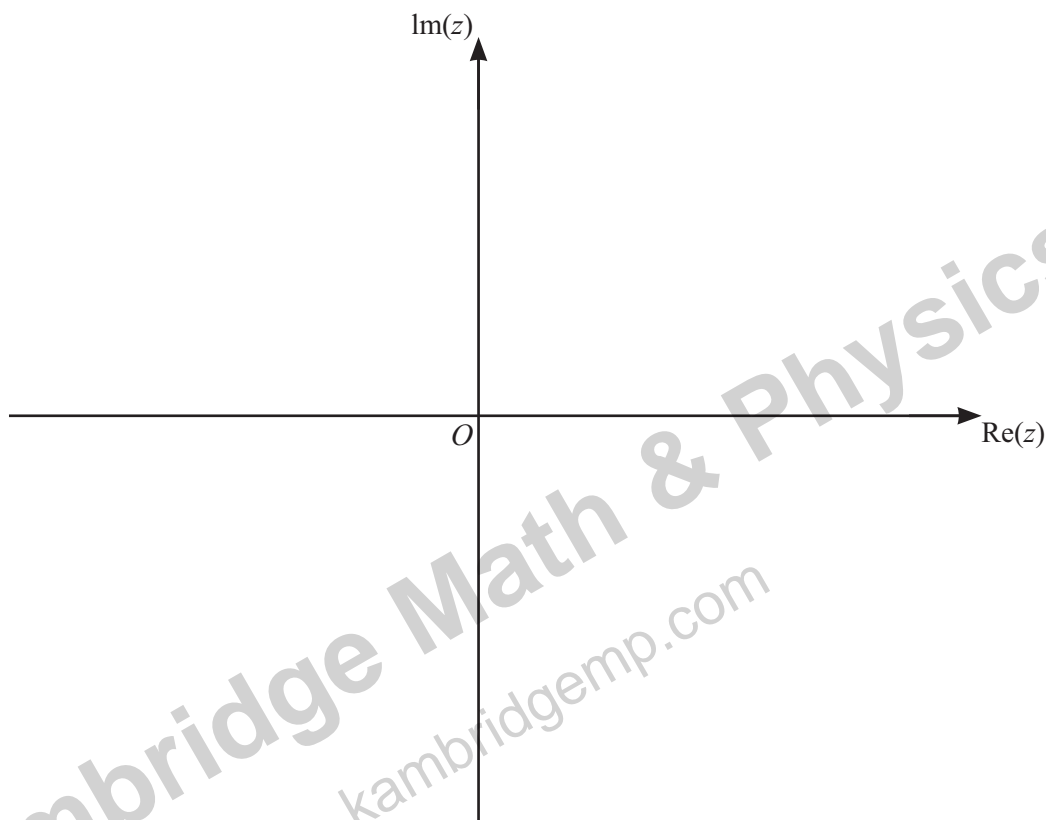
1 The complex number z satisfies $|z| = 2$ and $0 \leq \arg z \leq \frac{1}{4}\pi$.

(a) On the Argand diagram below, sketch the locus of the points representing z .

[2]

(b) On the **same diagram**, sketch the locus of the points representing z^2 .

[2]





(b) Solve the equation $\cos^4 \alpha - \sin^4 \alpha = 4 \sin^2 \alpha \cos^2 \alpha$ for $0^\circ \leq \alpha \leq 180^\circ$.

[3]

Handwriting practice area consisting of multiple horizontal dotted lines.

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(c) The point A on line l has coordinates $(0, 1, 1)$. The point B on line m has coordinates $(0, 2, -8)$.

Find the exact area of triangle APB .

[3]

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(b) It is given that when $t = 0$, $h = 50$.

Find the time taken for the depth of water in the tank to reach 80 cm. Give your answer correct to 2 significant figures. [5]

Area with horizontal dotted lines for writing the answer.

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Additional page

If you use the following page to complete the answer to any question, the question number must be clearly shown.

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