

Cambridge International AS & A Level

CANDIDATE
NAME

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CENTRE
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**MATHEMATICS****9709/33**

Paper 3 Pure Mathematics 3

October/November 2022**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.

- 5 (a) On a sketch of an Argand diagram, shade the region whose points represent complex numbers z satisfying the inequalities $|z + 2| \leq 2$ and $\text{Im } z \geq 1$. [4]

- (b) Find the greatest value of $\arg z$ for points in the shaded region. [2]

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(b) Verify by calculation that p lies between 2.5 and 3. [2]

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(c) Use an iterative formula based on the equation in part (a) to determine p correct to 2 decimal places. Give the result of each iteration to 4 decimal places. [3]

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