



# Cambridge International AS & A Level

CANDIDATE  
NAME

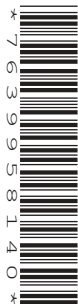
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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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## FURTHER MATHEMATICS

9231/12

Paper 1 Further Pure Mathematics 1

May/June 2020

2 hours

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 **16** pages. Blank pages are indicated.

1 Let  $a$  be a positive constant.

(a) Sketch the curve with equation  $y = \frac{ax}{x+7}$ .

[2]









(c) Sketch *C*.

[3]









The plane  $\Pi$  contains  $l_1$  and is parallel to the vector  $\mathbf{i} + \mathbf{k}$ .

- (b) Find the equation of  $\Pi$ , giving your answer in the form  $ax + by + cz = d$ . [4]

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- (c) Find the acute angle between  $l_2$  and  $\Pi$ . [3]

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