



# Cambridge International AS & A Level

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## MATHEMATICS

9709/22

Paper 2 Pure Mathematics 2

May/June 2026

1 hour 15 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. Do **not** use correction fluid or tape.
- 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 50.
- The number of marks for each question or part question is shown in brackets [ ].

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[illegible]

[illegible]



A graph showing the relationship between  $\ln y$  (vertical axis) and  $x$  (horizontal axis). The origin is labeled  $O$ . A straight line is plotted, passing through the points  $(1.5, 3.22)$  and  $(4.0, 4.69)$ .

The variables  $x$  and  $y$  satisfy the equation  $y = ka^{x+2}$ , where  $k$  and  $a$  are positive constants. The graph of  $\ln y$  against  $x$  is a straight line passing through the points  $(1.5, 3.22)$  and  $(4.0, 4.69)$ , as shown in the diagram.

Find the values of  $k$  and  $a$  correct to 2 significant figures. [5]

[illegible]

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5 (a) Solve the inequality  $|4x - 7| \leq |2x + 3|$ . [4]

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(b) Hence, find the smallest and largest integers,  $N$ , that satisfy the inequality

$$\left| 4 \ln\left(\frac{1}{2}N\right) - 7 \right| \leq \left| 2 \ln\left(\frac{1}{2}N\right) + 3 \right|. \quad [3]$$

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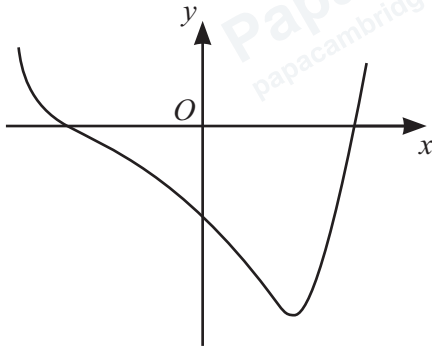
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The diagram shows the curve with equation  $y = f(x)$ , where

$$f(x) = ax^4 + 4x^3 - 3ax^2 - 21x - 18$$

and  $a$  is a constant. It is given that  $(x + 2)$  is a factor of  $f(x)$ .

(a) Find the value of  $a$ .

[2]

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(b) Show that the positive root of the equation  $f(x) = 0$  satisfies the equation

$$x = \sqrt[3]{3x + 4.5}.$$

[3]

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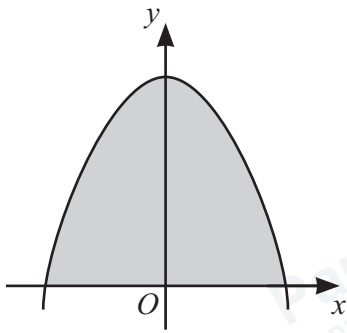




- (c) Use an iterative formula based on the equation  $x = \sqrt[3]{3x+4.5}$  to find the positive root of the equation  $f(x) = 0$  correct to 4 significant figures. Give the result of each iteration to 6 significant figures.

[3]

7



The diagram shows part of the curve with equation  $y = 8 \cos 2x - \frac{1}{\cos^2 2x}$ . The shaded region is bounded by the curve and the  $x$ -axis.

Find the exact area of the shaded region.

[7]

[illegible]



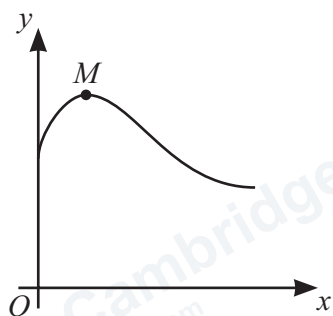
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$$x = 6t - \sin 2t, \quad y = 3 \cos 2t + 5 \sin t,$$

**(a)** Find the gradient of the curve at the point for which  $t = 0$ .

[4]

[illegible]



[5]

[illegible]

This image shows a full page of blank handwriting practice paper. It features multiple sets of horizontal lines. Each set consists of a solid top line, a dashed middle line, and a solid bottom line, providing a guide for letter height and placement. The paper is white with light gray or blue lines. There are faint, diagonal watermarks across the page that read "PapaCambridge.com".



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