



Cambridge International AS & A Level

CANDIDATE
NAME
CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

9709/11

Paper 1 Pure Mathematics 1

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.



BLANK PAGE





[4]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

- 2** The equation of a curve is such that $\frac{dy}{dx} = 4(2x-5)^3 - 9x^{\frac{1}{2}}$. The curve passes through the point $A\left(4, -\frac{11}{2}\right)$.

(a) Find the gradient of the normal to the curve at the point A . [2]

This image shows a full page of primary-ruled paper. It features ten sets of horizontal dashed lines, each set consisting of three parallel lines. These lines are evenly spaced vertically across the entire page, providing a guide for handwriting practice. The background is white, and there are no margins or other markings present.

(b) Find the equation of the curve. [4]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

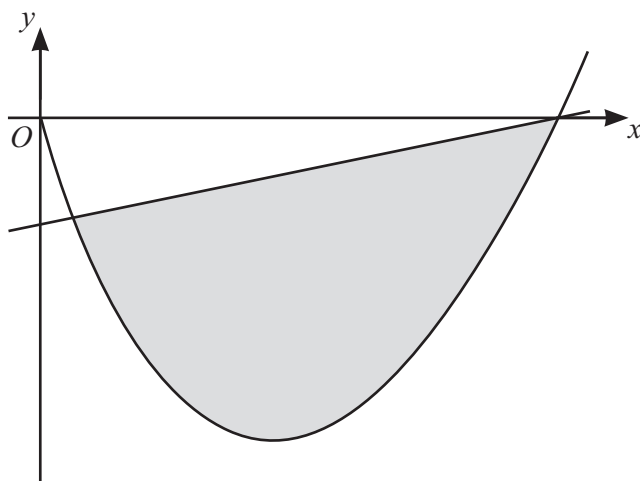


- (a) Find the tenth term of the progression. Give your answer correct to 3 significant figures. [5]

[illegible]

- (b)** Find the exact value of the sum to infinity of the progression. [2]

[illegible]



Find the area of the shaded region between the curve and the line.

[5]

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.



- (i) $(2 - px)^5$ [2]

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[illegible]

$$\textbf{(ii)} \quad \left(1 - \frac{1}{2}x\right)^4 \qquad [2]$$

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[illegible]

- (b) Given that the coefficient of x^2 in the expansion of $(2 - px)^5 \left(1 - \frac{1}{2}x\right)^4$ is 93, find the possible values of the constant p . [3]

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[illegible]

- [illegible]



(b) Given instead that $p = 4$, find the set of values of k for which the curve and the line do not intersect. [5]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

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- (a) A point P is moving along the curve in such a way that its y -coordinate is decreasing at 5 units per second.

Find the rate at which the x -coordinate of point P is changing when $x = 2$. [4]

[illegible]

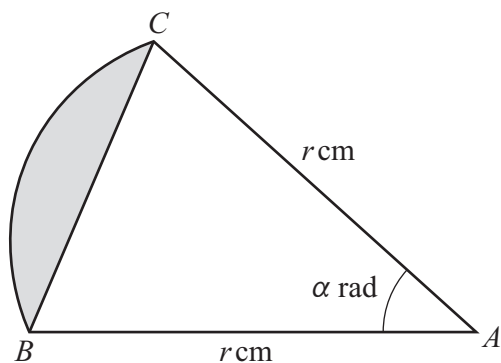


[5]

[illegible]

- Find the area of the triangle formed by the tangents to the circle at P and Q , and the line $x = -2$. [8]

[illegible]



The diagram shows a sector ABC of a circle with centre A and radius r cm. The angle BAC is α radians, where $0 < \alpha < \frac{1}{2}\pi$.

- (a)** It is given that the area of the triangle ABC is 4 cm^2 and the area of the sector ABC is $8\alpha\text{ cm}^2$.

Find the exact area of the shaded segment.

[4]

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for handwriting practice. There are no margins, text, or other markings on the page.

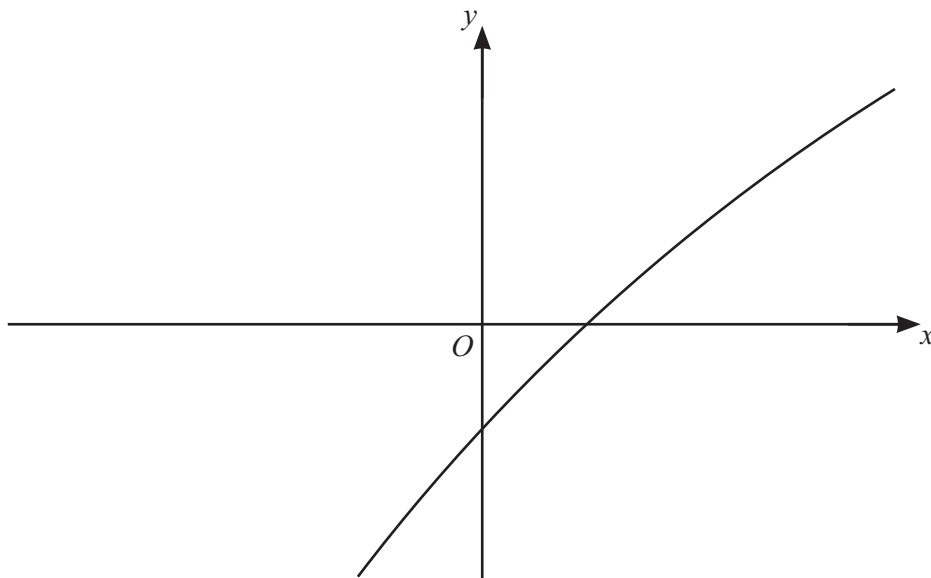


- Find the area of the shaded segment. Give your answer correct to 3 significant figures. [4]

[illegible]

$$g(x) = 3\sqrt{x+2} - 5 \quad \text{for } x \geq -2.$$

- [illegible]



(b) On the diagram sketch the graph of $y = g^{-1}(x)$ together with any relevant mirror line.



- (c) Find an expression for $g^{-1}(x)$. [2]

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- (d) State the range of g^{-1} . [1]

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The function h is defined by

$$h(x) = x - 2 \quad \text{for } x \geq 0.$$

- (e) Find the value of $g^{-1}h(4)$. [1]

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- (f) Explain why the composite function hg^{-1} cannot be formed. [1]

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[illegible]





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