



Cambridge International AS & A Level

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MATHEMATICS

9709/11

Paper 1 Pure Mathematics 1

May/June 2026

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. 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 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.



[4]

[illegible]

- 2 (a) Find the expansion of each of the following expressions, in ascending powers of x , up to and including the term in x^2 .

(i) $(1 + 2x)^5$ [2]

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(ii) $(3 + x^2)^6$ [1]

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- (b) Hence, find the coefficient of x^2 in the expansion of $(1 + 2x)^5(3 + x^2)^6$. [2]

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- 3** The curve with equation $y = x^3$ is stretched with scale factor 4 in the x -direction and then translated by $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$.

Find the equation of the transformed curve. You do not need to simplify your answer.

[3]

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[5]



5 The equation of a curve is

$$y = -\frac{1}{2}x + \sqrt{x^3 - 3x - 2}.$$

Find an equation of the normal to the curve at the point $(6, 11)$. Give your answer in the form $ax + by + c = 0$, where a , b and c are integers to be found.

[5]

[illegible]



- 6** The 10th, 11th and 12th terms of two different arithmetic progressions are $p+6$, $4p$ and p^2 respectively.

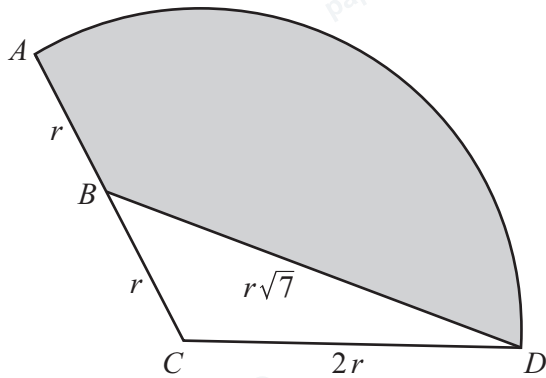
Find the difference between the 20th terms of the two progressions.

[6]

[illegible]



7



The diagram shows a sector ACD of a circle with centre C and radius $2r$. The midpoint of AC is B . The length of BD is $r\sqrt{7}$.

- (a) Find the exact perimeter of the shaded region. Give your answer in terms of π and r . [4]

Blank handwriting practice lines.





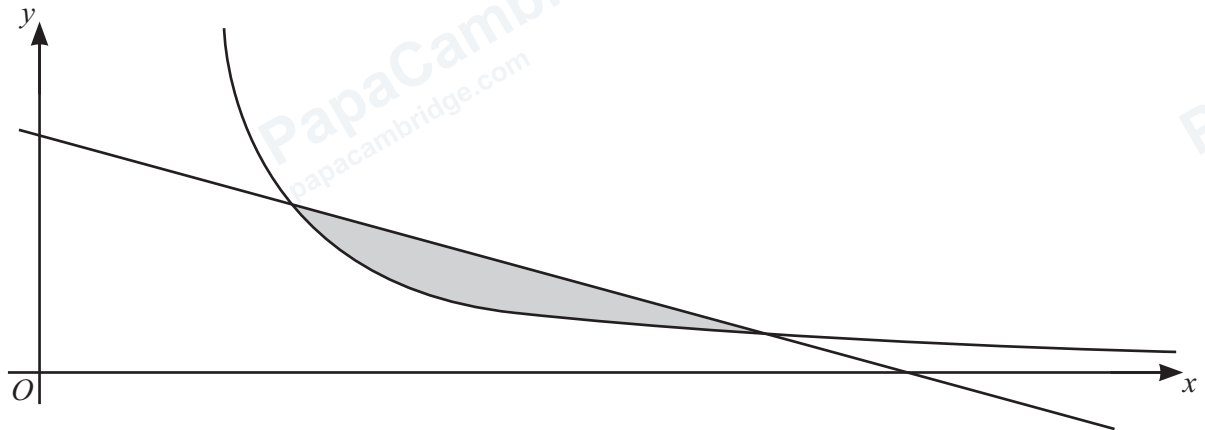
(b) Find the exact area of the shaded region. Give your answer in terms of π and r .

[4]

[illegible]



8



The diagram shows part of the curve with equation $y = \frac{5}{2x-1}$ and the line $y = 7 - 2x$.

Find the exact volume formed when the shaded region is rotated through 360° about the x -axis. [8]

[illegible]



9709/11/M/J/26

[Turn over



9 Functions f and g are defined by

$$f(x) = x - 3 \quad \text{for } x \in \mathbb{R},$$

$$g(x) = x^3 - 8a \quad \text{for } x \in \mathbb{R},$$

where a is a positive constant.

(a) Find an expression for $g^{-1}(x)$.

[2]

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(b) It is given that $gf(-1) + 20a^2 = 0$.

(i) Find the value of a .

[4]

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- (ii) Find the set of values of the constant k for which the equation $gf(x) = fg(x) + k$ has no real solutions.

[5]

[illegible]



- 10** The equation of a curve is such that $\frac{d^2y}{dx^2} = 3x^2 - 6$. The point $P(2, 3)$ is a stationary point on the curve.
- (a)** By evaluating $\frac{d^2y}{dx^2}$ at P , determine the nature of this stationary point. [1]

- (b) Find the equation of the curve. [5]





- (c) (i) Find the exact x -coordinates of any other stationary points. You may use the relationship $x^3 - (k+4)x + 2k \equiv (x-2)(x^2 + 2x - k)$ if necessary. [3]

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- (ii) Determine the nature of these stationary points. [2]

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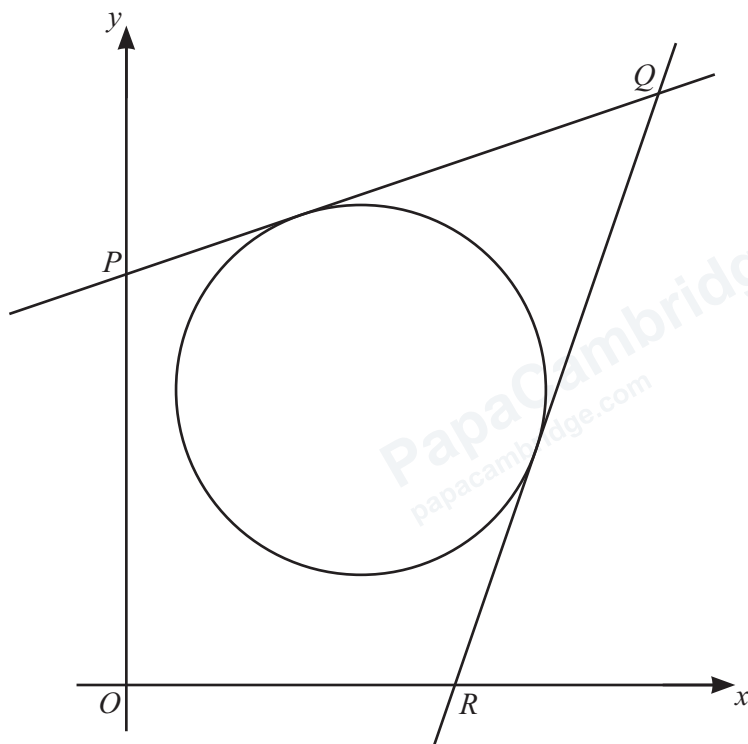
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11



The diagram shows a circle with equation

$$(x-8)^2 + (y-10)^2 = 40.$$

The tangent to the circle at the point $(6, 16)$ meets the y -axis at the point P . The tangent to the circle at the point $(14, 8)$ meets the x -axis at the point R . The two tangents meet at the point Q .

Find the exact area of the quadrilateral $OPQR$.

[9]

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Handwriting practice area with 20 sets of horizontal dotted lines.



[illegible]

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