

Please write clearly in block capitals.

Centre number

Candidate number

Surname

Forename(s)

Candidate signature

I declare this is my own work.

INTERNATIONAL AS

MATHEMATICS

(9660/MA01) Unit P1 Pure Mathematics

Wednesday 6 May 2026

08:00 UK Time

Time allowed: 1 hour 30 minutes

Materials

- For this paper you must have the OxfordAQA Booklet of Formulae and Statistical Tables (enclosed).
- You may use a graphical calculator.

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.

Advice

- Unless stated otherwise, you may quote formulae, without proof, from the booklet.
- Show all necessary working; otherwise marks may be lost.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	



Answer **all** questions in the spaces provided.

- 1** The n th term of a sequence is u_n where

$$u_{n+1} = u_n - 9$$

The fifth term $u_5 = 130$

- 1 (a) (i)** Find the value of u_1

Circle your answer.

[1 mark]

148

157

166

175

- 1 (a) (ii)** Find the value of n for which $u_n = 76$

Circle your answer.

[1 mark]

10

11

12

13



- 1 (b)** The n th term of the sequence can be written in the form

$$u_n = p - qn$$

where p and q are integers.

Find the value of p and the value of q

[2 marks]

$p =$ _____ $q =$ _____

- 1 (c)** State the mathematical name given to this type of sequence.

[1 mark]

5

Turn over for the next question

Turn over ►



2 (a) Expand

$$\left(3x^{\frac{5}{2}} + x^{\frac{1}{2}}\right)\left(5x^{\frac{3}{2}} - 4x^{-\frac{1}{2}}\right)$$

Simplify your answer.

[2 marks]

Answer _____

2 (b) By first rationalising the denominator, show that

$$\frac{9\sqrt{10} + 2\sqrt{3}}{\sqrt{10} + \sqrt{3}} = m - \sqrt{n}$$

where m and n are integers.**[4 marks]**



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6



3 It is given that

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

3 (a) Use the Factor Theorem to show that $(x - 3)$ is a factor of $f(x)$

[2 marks]

3 (b) By first writing $f(x)$ as the product of $(x - 3)$ and a three-term quadratic factor, express $f(x)$ in the form

$$(x + a)(x + b)^2$$

where a and b are constants.

[3 marks]

Answer _____



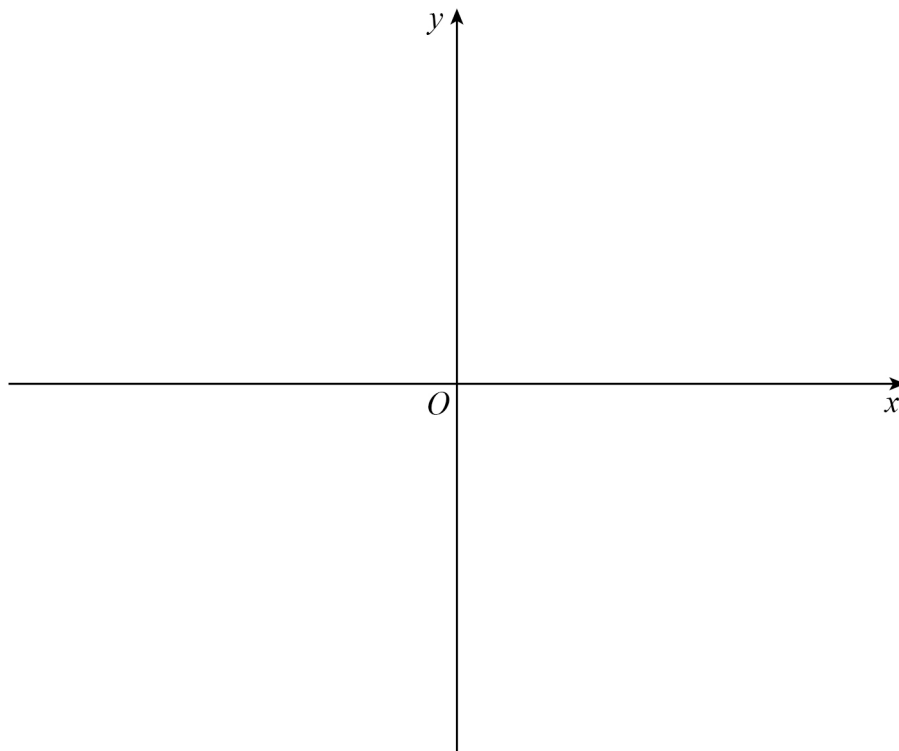
- 3 (c)** The graph of $y = f(x)$ is mapped onto the graph of $y = f(-x)$

Sketch the graph of the curve $y = f(-x)$ on the axes in **Figure 1**

Show on your graph the coordinates of any points where the curve cuts or touches the axes.

[3 marks]

Figure 1



8

Turn over for the next question

Turn over ►



- 4** The first three terms of an arithmetic series are

$$t + 6, \quad t^2 - 4t - 12 \quad \text{and} \quad 4t^2 - 25t - 70$$

where t is a constant.

- 4 (a)** Show that the possible values of t satisfy

$$t^2 - 8t - 20 = 0$$

[2 marks]

- 4 (b)** You are given that every term in the series is positive.

- 4 (b) (i)** The k th term is equal to three times the 8th term.

Find the value of k

[5 marks]



[3 marks]

10

Give your answer to two decimal places.

[illegible]

Answer

[2 marks]

[illegible]

Turn over ►



The coordinates of A are $(13, 5)$ and the coordinates of C are $(3, -9)$

Give your answer in the form $px + qy + r = 0$ where p , q and r are integers.

[5 marks]

[illegible]

Answer



[4 marks]

[illegible]

Answer _____

9

Turn over ►



- 7** A student uses the trapezium rule with six ordinates (five strips) to find an estimate for the value of

$$\int_0^2 f(x) \, dx$$

where $f(x) = (2x - 3)^2 (2^{2x-3}) + 0.5$

- 7 (a) (i)** The student starts their calculation by producing a table of values.

Complete their table in **Figure 3**, giving your values to four decimal places.

[2 marks]

Figure 3

x	0	0.4	0.8	1.2	1.6	2
$f(x)$	1.625	1.5534		0.7375		2.5

- 7 (a) (ii)** Hence use the trapezium rule with six ordinates (five strips) to find an estimate for the value of $\int_0^2 f(x) \, dx$

Give your answer to three decimal places.

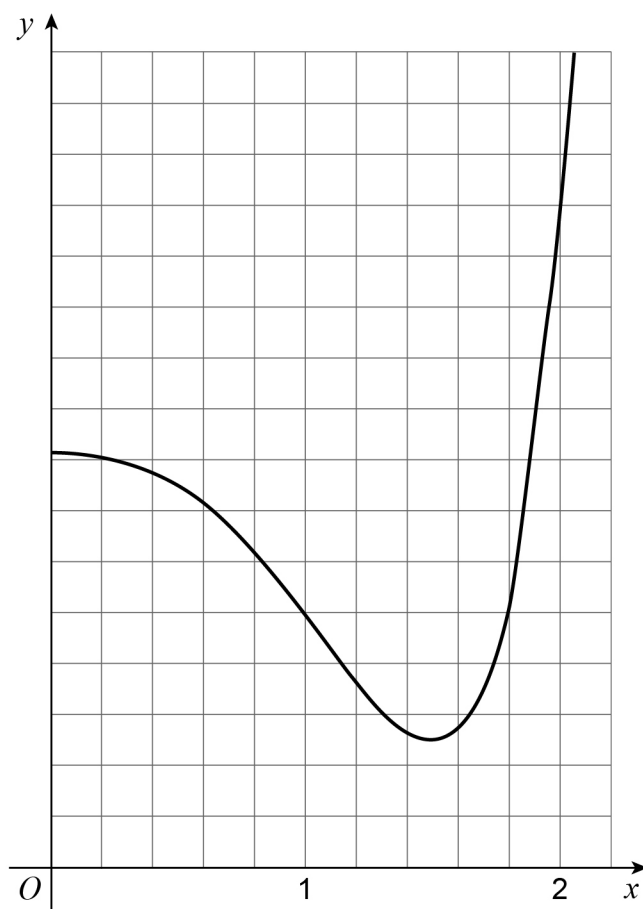
[3 marks]

Answer _____



7 (b) Figure 4 shows part of the curve with equation $y = f(x)$

Figure 4



The student claims that using the trapezium rule with six ordinates (five strips) would lead to an **overestimate** for the actual value of $\int_0^2 f(x) \, dx$

Draw the five trapezia on **Figure 4** and explain why the student's claim is correct.

[2 marks]

7



8

$$y = \frac{81}{x^2} + 4\sqrt{x} - 5$$

The point $Q(9, 8)$ lies on G

The line L is the tangent to G at Q

8 (a)

$$y = \frac{4}{9}x + 4$$

[5 marks]

[illegible]

8 (b)

$$y = \frac{1}{3}x^2 - \frac{23}{9}x - 50$$

Find the values of x for which H lies on or above L

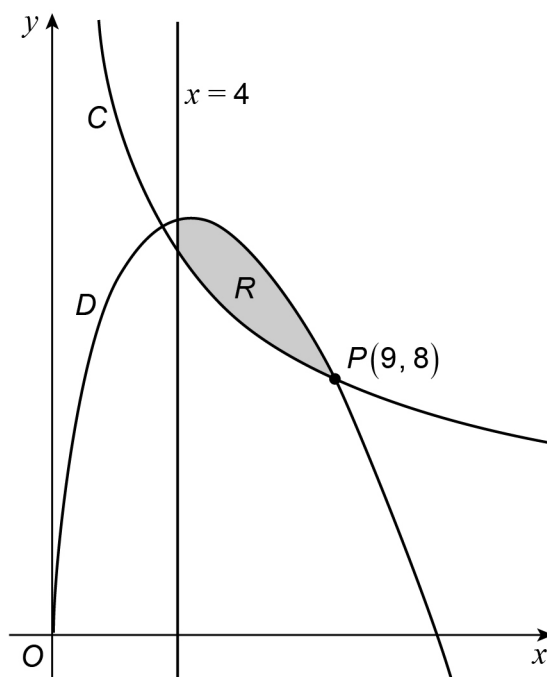
[4 marks]

[illegible]

Answer _____

- 9 **Figure 5** shows the curves C and D , the line $x = 4$ and the finite shaded region R

Figure 5



Curve C has equation $y = 24x^{-\frac{1}{2}}$

Curve D has equation $y = 9x^{\frac{1}{2}} + x - x^{\frac{3}{2}} - 1$

Curves C and D intersect at the point $P(9, 8)$

The finite shaded region R is bounded by C , D and the line $x = 4$

- 9 (a) It is given that $\int_k^9 24x^{-\frac{1}{2}} dx = 48$ where k is a constant.

Show that $k = 4$

[2 marks]

9 (b) Find $\int \left(9x^{\frac{1}{2}} + x - x^{\frac{3}{2}} - 1 \right) dx$

[2 marks]

Answer _____

9 (c) Use **part (a)** and **part (b)** to find the area of R

[3 marks]

Answer _____

9 (d) The curve D is mapped onto a curve E by the translation $\begin{bmatrix} 0 \\ 3 \end{bmatrix}$

Use your answer to **part (c)** to find the area of the finite region bounded by C , E and the lines $x = 4$ and $x = 9$

[2 marks]

Answer _____

9

Turn over ►



10 (a) Show that $r = \pm \frac{3}{5}$

[4 marks]

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10 (b) In the case when $r = \frac{3}{5}$, find the sum to infinity of the series.

[3 marks]

Answer _____

7

END OF QUESTIONS



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