Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Friday 8 May 2026

Morning (Time: 1 hour 30 minutes)

Paper reference **WMA11/01**

Mathematics

International Advanced Subsidiary/Advanced Level
Pure Mathematics P1

You must have:
Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 10 questions in this question paper. The total mark for this paper is 75.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ▶

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1. Find

$$\int \left(3x + \frac{2}{x}\right)^2 \mathrm{d}x$$

giving the answer in simplest form.

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Question 1 continued

(Total for Question 1 is 5 marks)

2. The line l_1 has equation $y = 10 - 3x$

The line l_2

- is perpendicular to l_1
- intersects l_1 at the point P with x coordinate 4

(a) Find an equation for l_2 writing the answer in the form $ax + by + c = 0$, where a, b and c are integers.

(3)

Given that

- line l_1 cuts the y-axis at the point M
- line l_2 cuts the y-axis at the point N

(b) find the area of triangle MPN, making your method clear.

(3)

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Question 2 continued

(Total for Question 2 is 6 marks)

3. A triangular plot of land, ABC, has area $60\ \text{m}^2$

Given

- $AB = 15\ \text{m}$
- $AC = 10\ \text{m}$
- angle $BAC = \theta°$

(a) show that $\sin\theta° = \frac{4}{5}$

(1)

Given also that $\theta°$ is the **largest** angle in the triangle,

(b) find the length of the side BC, in metres, to 3 significant figures,

(3)

(c) find the size of the **smallest** angle in the triangle, in degrees, to one decimal place.

(2)

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Question 3 continued

(Total for Question 3 is 6 marks)

4. **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

$$f(x) = x^3 - 2x^2\sqrt{x} + 14 \qquad x > 0$$

(a) Solve the equation

$$f'(x) = 0$$

(5)

(b) (i) Show that the equation

$$f''(x) = 66$$

can be written as

$$4x - 5x^{\frac{1}{2}} - 44 = 0$$

(ii) Hence, using algebra, show that $x = 16$ is the only solution of the equation

$$f''(x) = 66$$

(5)

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Question 4 continued

Question 4 continued

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Question 4 continued

(Total for Question 4 is 10 marks)

5. The curve C has equation

$$y = -2x^2 + 12x + 7$$

(a) Write $-2x^2 + 12x + 7$ in the form $a(x + b)^2 + c$, where a, b and c are constants.

(3)

The point P is the maximum point on C.

(b) Find the coordinates of P.

(2)

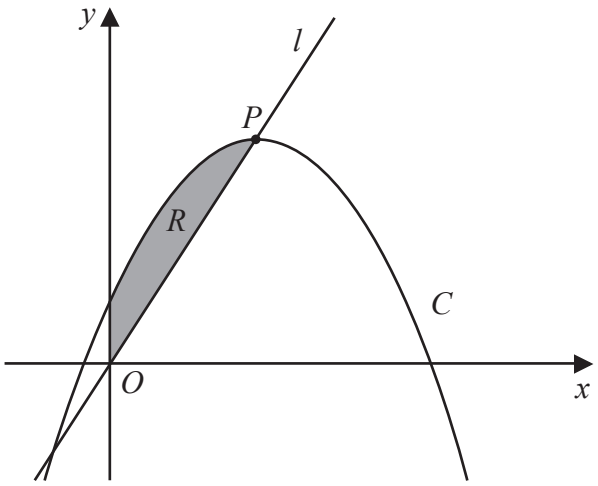


Figure 1

Figure 1 shows a sketch of the curve C and a line l.

The line l passes through the point P and the origin O.

The region R, shown shaded in Figure 1, is bounded by C, l and the y-axis.

(c) Use inequalities to define R.

(2)

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Question 5 continued

(Total for Question 5 is 7 marks)

6.

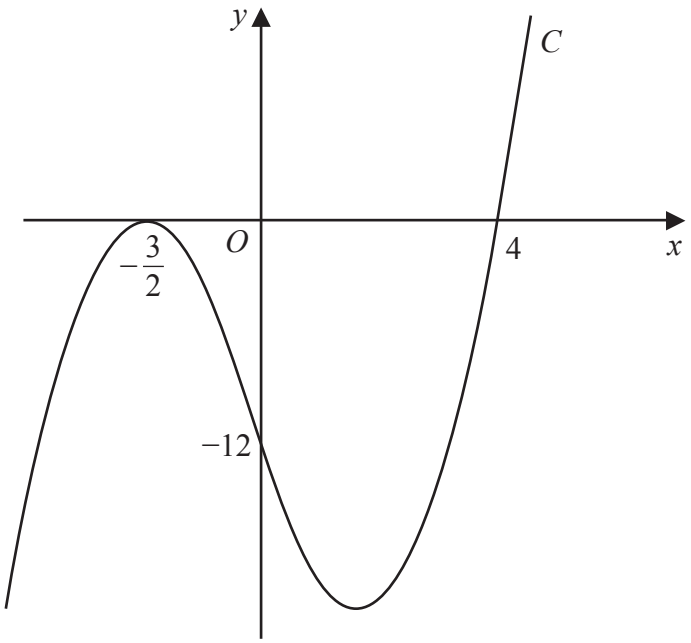


Figure 2

Figure 2 shows a sketch of the curve C with equation $y = \mathrm{f}(x)$.

The curve C

- touches the x-axis at $-\frac{3}{2}$
- cuts the x-axis at 4
- cuts the y-axis at -12

Given that $\mathrm{f}(x)$ is a cubic function,

(a) find $\mathrm{f}(x)$. You may leave the answer in a factorised form.

(3)

The line with equation $y = 2x - 12$ cuts C at $(0, -12)$ and at two further points, P and Q.

(b) Use algebra to find the exact x coordinates of P and Q.
Give each answer in simplest form.

(*Solutions relying entirely on calculator technology are not acceptable.*)

(4)

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Question 6 continued

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Question 6 continued

(Total for Question 6 is 7 marks)

7.

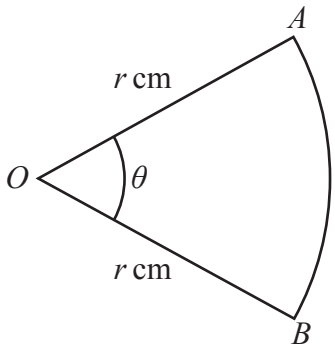


Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows a sector AOB of a circle, centre O.

The radius OA of the sector is r cm and angle AOB is θ radians.

Given that

- the **area** of sector AOB is $1\,\text{cm}^2$
- the **perimeter** of sector AOB is $8\,\text{cm}$

(a) write down two different equations involving r and θ.

(2)

Given that $r > 2$

(b) solve the two simultaneous equations in part (a) to find the exact value of r and the exact value of θ.
Write each answer in the form $a + b\sqrt{c}$ where a, b and c are integers.

(*Solutions relying on calculator technology are not acceptable.*)

(5)

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Question 7 continued

(Total for Question 7 is 7 marks)

8. A curve C has equation $y = \mathrm{f}(x),\ x > 0$

The point P with x coordinate $\frac{1}{4}$ lies on C.

Given that

- $\mathrm{f}'(x) = 10 + \dfrac{5\sqrt{x} - 4}{2x^2}$
- the tangent to C at P has equation $y = kx + 2$, where k is a constant

(a) (i) find the value of k

(ii) find the equation of the normal to C at P.
Give the answer in the form $y = mx + c$, where m and c are constants.

(6)

(b) Find $\mathrm{f}(x)$.

(5)

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Question 8 continued

Question 8 continued

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Question 8 continued

(Total for Question 8 is 11 marks)

9.

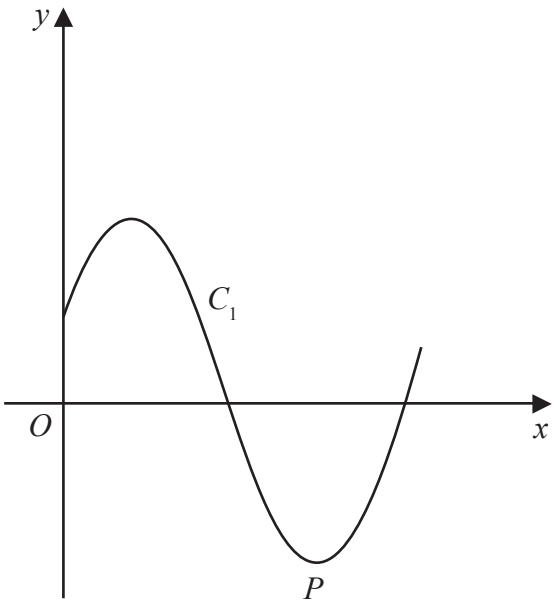


Figure 4

The curve C_1 has equation $y = \sin\left(x + \frac{\pi}{8}\right)$

Figure 4 shows a sketch of C_1 in the interval $0 \leqslant x < 2\pi$

The point P is a minimum turning point on C_1 and is shown in Figure 4.

(a) State the x coordinate of P.

(1)

(b) State the number of roots of the equation

$$\sin\left(x + \frac{\pi}{8}\right) = \sin\left(\frac{\pi}{8}\right)$$

in the interval $0 \leqslant x < 101\pi$, giving a reason for your answer.

(2)

The curve C_2 has equation $y = -5\sin\left(x + \frac{\pi}{8}\right)$

The point Q is the minimum turning point on C_2 in the interval $0 \leqslant x < 2\pi$

(c) State the coordinates of Q.

(2)

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Question 9 continued

(Total for Question 9 is 5 marks)

10. The curve C has equation

$$y = \frac{3k}{x - 2k} \qquad x \neq 2k$$

where k is a positive constant.

(a) Sketch a graph of C.
Show on your sketch the coordinates of the point where C crosses a coordinate axis.

(3)

The line l has equation $x + y = 12$

Given that l is a tangent to C,

(b) show that

$$k^2 - 15k + 36 = 0$$

(4)

The line l meets C at a point P.

Given that P lies below the x-axis,

(c) find the coordinates of P.

(*Solutions relying entirely on calculator technology are not acceptable.*)

(4)

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Question 10 continued

Question 10 continued

(Total for Question 10 is 11 marks)

TOTAL FOR PAPER IS 75 MARKS

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