

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Wednesday 21 October 2020

Morning (Time: 1 hour 30 minutes)

Paper Reference **WMA12/01**

Mathematics

International Advanced Subsidiary/Advanced Level
Pure Mathematics P2

You must have:

Mathematical Formulae and Statistical Tables (Lilac), 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 9 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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- $$\left(2 - \frac{x}{4}\right)^{10}$$

(4)

- $$\left(3 - \frac{1}{x}\right)^2 \left(2 - \frac{x}{4}\right)^{10}$$

(3)

Question 1 continued

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Question 1 continued

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Question 1 continued

Lined area for writing the answer to Question 1 continued.

(Total 7 marks)

Q1



$$y = \frac{2^x}{\sqrt{(5x^2 + 3)}}$$

x	-0.25	0	0.25	0.5	0.75
y	0.462		0.653		0.698

$$\int_{-0.25}^{0.75} \frac{2^x}{\sqrt{(5x^2 + 3)}} \, dx$$

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Question 2 continued

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(Total 4 marks)

Q2





Question 3 continued

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Question 3 continued

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(Total 10 marks)

Q3



4. The points P and Q have coordinates $(-11, 6)$ and $(-3, 12)$ respectively.

Given that PQ is a diameter of the circle C ,

- (a) (i) find the coordinates of the centre of C ,

- (ii) find the radius of C .

(4)

- (b) Hence find an equation of C .

(2)

- (c) Find an equation of the tangent to C at the point Q giving your answer in the form $ax + by + c = 0$ where a , b and c are integers to be found.

(3)

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Question 4 continued

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Question 4 continued

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(Total 9 marks)

Q4



- (e) State, with a reason, which of the solutions to the equation in part (c) is **not** a sensible value for n . (1)

Question 5 continued

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Question 5 continued

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Question 5 continued

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(Total 11 marks)

Q5



6.

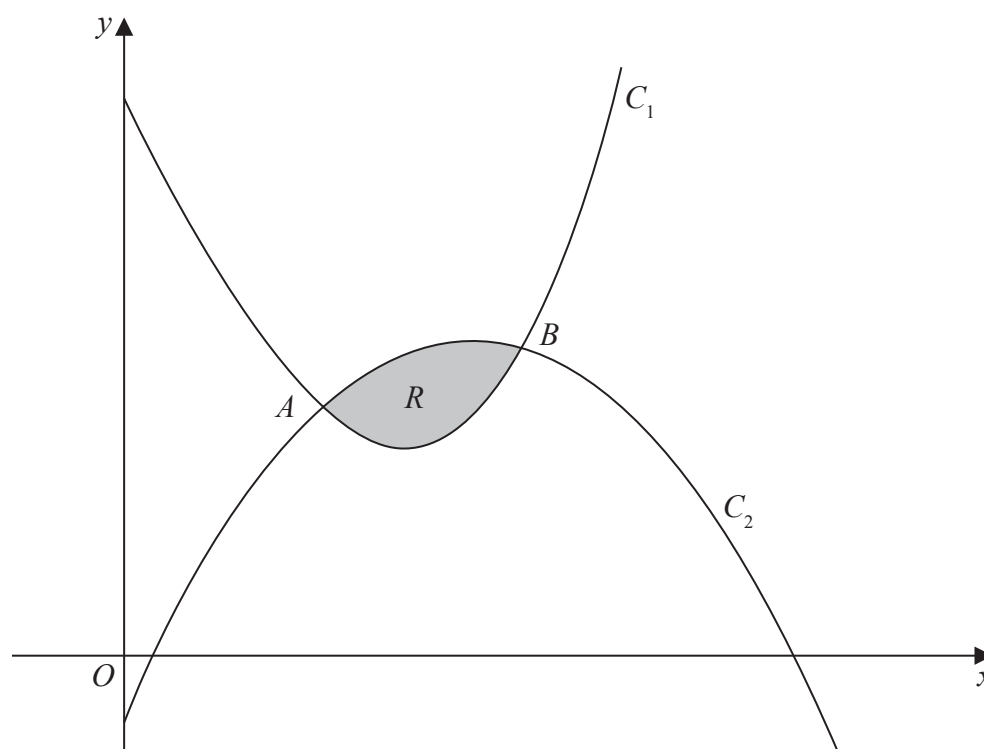


Figure 1

Figure 1 shows a sketch of part of the curves C_1 and C_2 with equations

$$\begin{aligned} C_1 : y &= x^3 - 6x + 9 & x &\geq 0 \\ C_2 : y &= -2x^2 + 7x - 1 & x &\geq 0 \end{aligned}$$

The curves C_1 and C_2 intersect at the points A and B as shown in Figure 1.

The point A has coordinates $(1, 4)$.

Using algebra and showing all steps of your working,

- (a) find the coordinates of the point B . (4)

The finite region R , shown shaded in Figure 1, is bounded by C_1 and C_2

- (b) Use algebraic integration to find the exact area of R . (5)



Question 6 continued

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Question 6 continued

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Question 6 continued

Lined area for writing the answer to Question 6.

(Total 9 marks)

Q6



$$\tan \theta + \frac{1}{\tan \theta} \equiv \frac{1}{\sin \theta \cos \theta} \quad \theta \neq \frac{n\pi}{2} \quad n \in \mathbb{Z} \quad (3)$$

(Solutions based entirely on graphical or numerical methods are not acceptable.)

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Question 7 continued

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(Total 7 marks)

Q7



- (c) Hence find the sum of the first 13 terms of the series, giving your answer to 2 decimal places. (3)

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Question 8 continued

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Question 8 continued

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(Total 8 marks)

Q8



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Question 9 continued

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Question 9 continued

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Q9

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(Total 10 marks)

TOTAL FOR PAPER IS 75 MARKS

END

