

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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Pearson Edexcel International Advanced Level

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.

Turn over ►

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Question 1 continued

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Q1

(Total 5 marks)





Question 2 continued

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Q2

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Question 3 continued

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Q3

(Total 6 marks)



Question 4 continued

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Q4

(Total 5 marks)



- (3)

Question 5 continued

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Question 5 continued

Lined area for writing the answer to Question 5.



Question 5 continued

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Q5

(Total 8 marks)



6. In this question you must show all stages of your working.

Solutions relying on calculator technology are not acceptable.

A curve C has equation $y = f(x)$ where

$$f(x) = 2(x + 1)(x - 3)^2$$

(a) Sketch a graph of C .

Show on your graph the coordinates of the points where C cuts or meets the coordinate axes.

(3)

(b) Write $f(x)$ in the form $ax^3 + bx^2 + cx + d$, where a, b, c and d are constants to be found.

(3)

(c) Hence, find the equation of the tangent to C at the point where $x = \frac{1}{3}$

(4)

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Question 6 continued

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Question 6 continued

Lined area for writing the answer to Question 6.



Question 6 continued

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Q6

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(Total 10 marks)



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The diagram shows a circular sector with center O and angle θ . The sector is bounded by radii OA and OC and the arc AC . The region outside the sector but within the circle is labeled X . A line segment AB connects point A on the arc to point B outside the circle. A line segment BC connects point B to point C on the arc. The angle θ is indicated at the center O between the radii OA and OC .

Question 7 continued

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Question 7 continued

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Question 7 continued

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Q7

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(Total 10 marks)



Question 8 continued

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Question 8 continued

Lined area for writing the answer to Question 8.



Question 8 continued

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Q8

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(Total 10 marks)



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

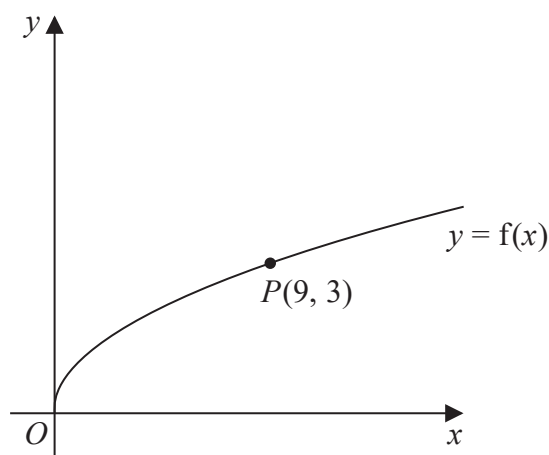


Figure 5

Figure 5 shows a sketch of the curve with equation $y = f(x)$ where

$$f(x) = \sqrt{x} \quad x > 0$$

The point $P(9, 3)$ lies on the curve and is shown in Figure 5.

On the next page there is a copy of Figure 5 called Diagram 1.

- (a) On Diagram 1, sketch and clearly label the graphs of

$$y = f(2x) \quad \text{and} \quad y = f(x) + 3$$

Show on each graph the coordinates of the point to which P is transformed.

(3)

The graph of $y = f(2x)$ meets the graph of $y = f(x) + 3$ at the point Q .

- (b) Show that the x coordinate of Q is the solution of

$$\sqrt{x} = 3(\sqrt{2} + 1)$$

(3)

- (c) Hence find, in simplest form, the coordinates of Q .

(3)



A Cartesian coordinate system with a horizontal x-axis and a vertical y-axis. The origin is labeled O . A curve, labeled $y = f(x)$, starts at the origin and increases as it moves to the right. A point on the curve is marked with a black dot and labeled $P(9, 3)$.

Diagram 1

Turn over for a copy of Diagram 1 if you need to redraw your graphs.



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Question 9 continued

Lined area for writing the answer to Question 9.



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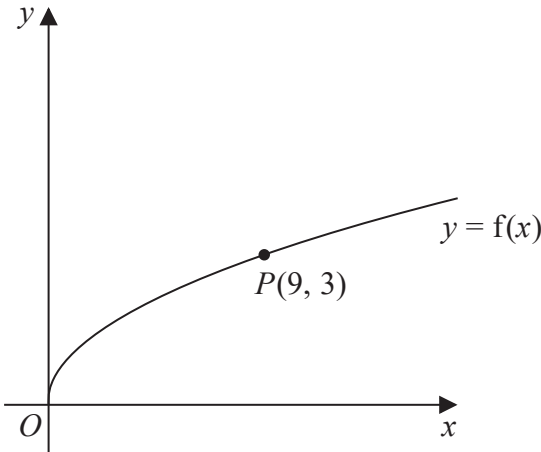
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Question 9 continued

Lined area for writing the answer to Question 9.

Only use this copy if you need to redraw your graphs.



Copy of Diagram 1

(Total 9 marks)

Q9





Question 10 continued

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TOTAL FOR PAPER IS 75 MARKS

END