

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 9 October 2019

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 (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 11 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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Question 1 continued

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Q1

(Total 5 marks)



- Given that the height, H metres, of the tree, t years after it was planted in the ground, can be modelled by the equation

where a and b are constants,

- (4)

- (1)

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Question 2 continued

Lined area for writing the answer to Question 2.

(Total 5 marks)

Q2



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

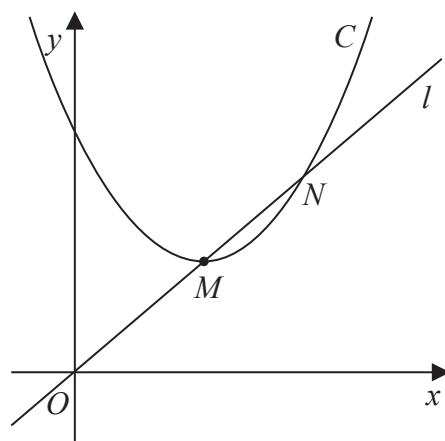


Figure 2

Figure 2 shows a sketch of the curve C with equation $y = x^2 - 5x + 13$

The point M is the minimum point of C .

The straight line l passes through the origin O and intersects C at the points M and N as shown.

Find, showing your working,

- (a) the coordinates of M , (3)

- (b) the coordinates of N . (5)

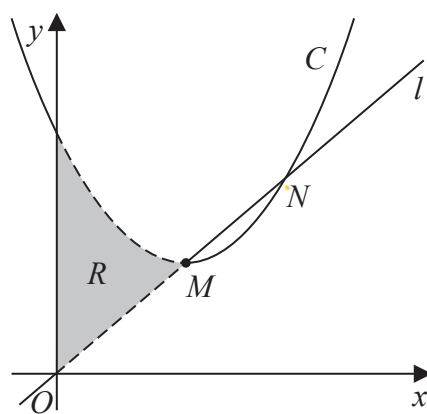


Figure 3

Figure 3 shows the curve C and the line l . The finite region R , shown shaded in Figure 3, is bounded by C , l and the y -axis.

- (c) Use inequalities to define the region R . (2)

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Question 3 continued

Handwriting practice area with 30 horizontal lines.

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Question 3 continued

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Question 3 continued

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Q3

(Total 10 marks)



- (b) the length of diagonal BD , in cm, to one decimal place.

(2)

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Question 4 continued

Lined area for writing the answer to Question 4.

(Total 5 marks)

Q4



Question 5 continued

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(Total 7 marks)

Q5



(a) Sketch a graph of C , stating the equation of the horizontal asymptote and the coordinates of the point of intersection with the x-axis.

The line with equation $y = 10 - 2x$ is a tangent to C .

(b) Find the possible values for k .

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Question 6 continued

Lined area for writing the answer to Question 6.

(Total 8 marks)

Q6



Question 7 continued

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(Total 6 marks)

Q7



8. Solve, using algebra, the equation

$$x - 6x^{\frac{1}{2}} + 4 = 0$$

Fully simplify your answers, writing them in the form $a + b\sqrt{c}$, where a , b and c are integers to be found.

(5)

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Question 8 continued

Lined area for writing the answer to Question 8.

(Total 5 marks)

Q8



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Question 9 continued

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(Total 4 marks)

Q9



10.

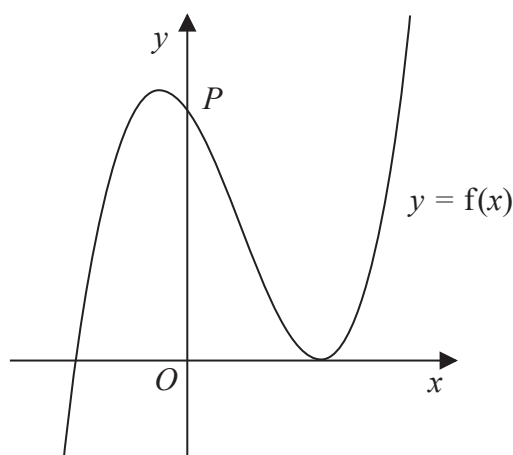


Figure 6

Figure 6 shows a sketch of part of the curve with equation $y = f(x)$, where

$$f(x) = (2x + 5)(x - 3)^2$$

- (a) Deduce the values of x for which $f(x) \leq 0$ (2)

The curve crosses the y -axis at the point P , as shown.

- (b) Expand $f(x)$ to the form

$$ax^3 + bx^2 + cx + d$$

where a , b , c and d are integers to be found. (3)

- (c) Hence, or otherwise, find

- (i) the coordinates of P ,
(ii) the gradient of the curve at P . (2)

The curve with equation $y = f(x)$ is translated two units in the positive x direction to a curve with equation $y = g(x)$.

- (d) (i) Find $g(x)$, giving your answer in a simplified factorised form.
(ii) Hence state the y intercept of the curve with equation $y = g(x)$. (3)

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Question 10 continued

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Question 10 continued

Lined area for writing the answer to Question 10.

(Total 10 marks)

Q10



The point $P\left(4, \frac{32}{3}\right)$ lies on the curve.

- $f''(x) = \frac{4}{\sqrt{x}} - 3$
- $f'(x) = 5$ at P

(a) the equation of the tangent to the curve at P , writing your answer in the form $y = mx + c$, where m and c are constants to be found,

(b) $f(x)$.

(8)

Question 11 continued

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Q11

Question 11 continued

Lined area for writing the answer to Question 11.

(Total 10 marks)

TOTAL FOR PAPER IS 75 MARKS

END

