

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 22 May 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 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. The curve  $C$  has equation  $y = \frac{1}{8}x^3 - \frac{24}{\sqrt{x}} + 1$

- (3)

(b) Find the equation of the tangent to  $C$  at the point  $P$ . Write your answer in the form  $y = mx + c$ , where  $m$  and  $c$  are constants to be found.

(3)

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Question 1 continued

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(Total 6 marks)

Q1





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Question 2 continued

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(Total 5 marks)

Q2



3.

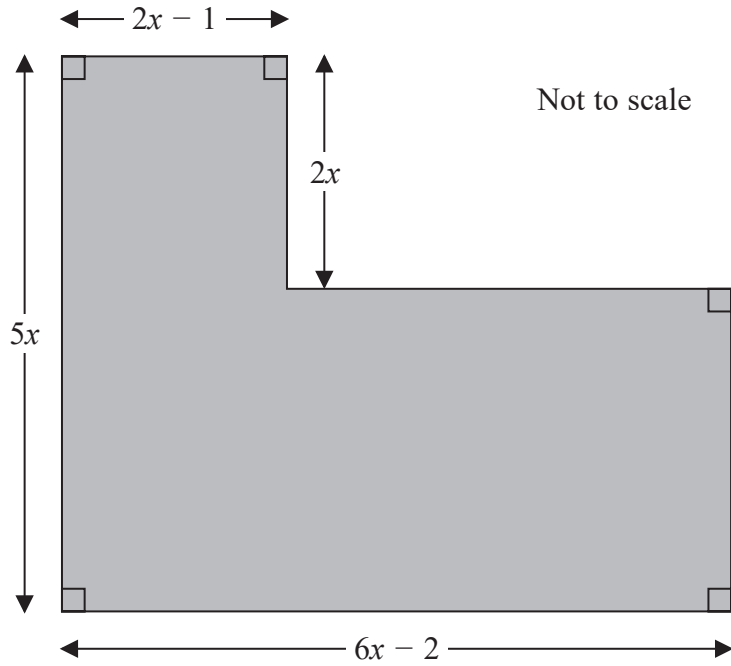


**Figure 1**

Figure 1 shows the plan of a garden. The marked angles are right angles.

The six edges are straight lines.

The lengths shown in the diagram are given in metres.

Given that the perimeter of the garden is greater than 29 m,

(a) show that  $x > 1.5$  m

(3)

Given also that the area of the garden is less than  $72 \text{ m}^2$ ,

(b) form and solve a quadratic inequality in  $x$ .

(5)

(c) Hence state the range of possible values of  $x$ .

(1)

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Question 3 continued

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### Question 3 continued

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Question 3 continued

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(Total 9 marks)

Q3



4. Find

$$\int \frac{4x^2 + 1}{2\sqrt{x}} dx$$

giving the answer in its simplest form.

(5)

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Question 4 continued

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(Total 5 marks)

Q4



5. (a) Find, using algebra, all real solutions of

$$2x^3 + 3x^2 - 35x = 0 \quad (3)$$

- (b) Hence find all real solutions of

$$2(y - 5)^6 + 3(y - 5)^4 - 35(y - 5)^2 = 0 \quad (4)$$

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Question 5 continued

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Q5



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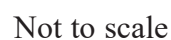
Question 6 continued

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(Total 7 marks)

Q6





Question 7 continued

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Question 7 continued

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Question 7 continued

Handwriting practice area with 20 horizontal lines.

(Total 10 marks)

Q7





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Question 8 continued

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### Question 8 continued

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Question 8 continued

Lined area for writing the answer to Question 8.

(Total 9 marks)

Q8

Mark box for Question 8.



9.

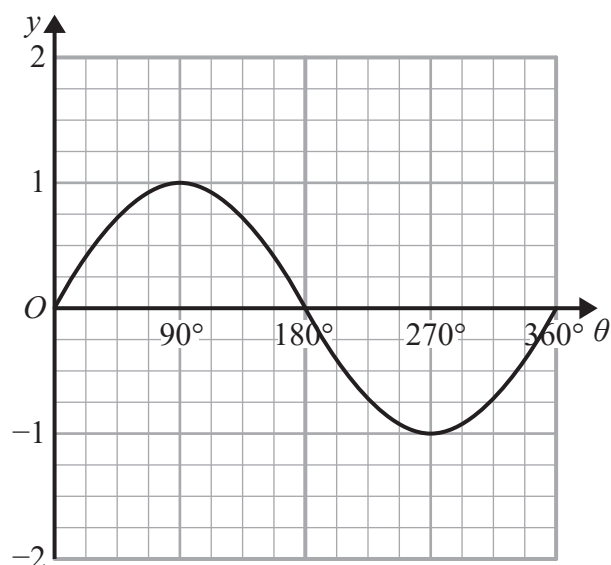


**Figure 3**

Figure 3 shows a plot of the curve with equation  $y = \sin \theta$ ,  $0 \leq \theta \leq 360^\circ$

(a) State the coordinates of the minimum point on the curve with equation

$$y = 4 \sin \theta, \quad 0 \leq \theta \leq 360^\circ$$

(2)

A copy of Figure 3, called Diagram 1, is shown on the next page.

(b) On Diagram 1, sketch and label the curves

(i)  $y = 1 + \sin \theta$ ,  $0 \leq \theta \leq 360^\circ$

(ii)  $y = \tan \theta$ ,  $0 \leq \theta \leq 360^\circ$

(2)

(c) Hence find the number of solutions of the equation

(i)  $\tan \theta = 1 + \sin \theta$  that lie in the region  $0 \leq \theta \leq 2160^\circ$

(ii)  $\tan \theta = 1 + \sin \theta$  that lie in the region  $0 \leq \theta \leq 1980^\circ$

(3)

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Question 9 continued

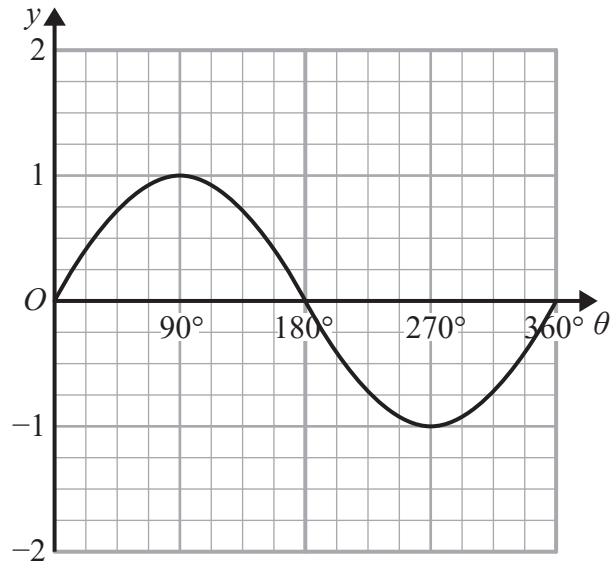


Diagram 1

Q9

(Total 7 marks)





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Question 10 continued

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**TOTAL FOR PAPER IS 75 MARKS**