

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

A Level Clouds 出品

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 allowed 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 ►



Pearson

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

(a) Find $\frac{dy}{dx}$, giving the answer in its simplest form.

(3)

The point $P(4, -3)$ lies on C .

(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

Handwriting practice area with horizontal lines.

(Total for Question 1 is 6 marks)

2. The point A has coordinates $(-1, 5)$ and the point B has coordinates $(4, 1)$.

The line l passes through the points A and B .

- (a) Find the gradient of l .

(2)

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

(2)

The point M is the midpoint of AB .

The point C has coordinates $(5, k)$ where k is a constant.

Given that the distance from M to C is $\sqrt{13}$

- (c) find the exact possible values of the constant k .

(4)

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Question 2 continued

Lined area for writing the answer to Question 2.

Question 2 continued

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Question 2 continued

Handwriting practice area with 30 horizontal lines.

(Total for Question 2 is 8 marks)

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Figure 1 shows a semicircle with centre O and radius 3 cm. XY is the diameter of this semicircle. The point Z is on the circumference such that angle $XOZ = 1.3$ radians. The shaded region enclosed by the chord XZ , the arc ZY and the diameter XY is a template for a badge.

(a) the length of the chord XZ ,

(2)

(b) the perimeter of the template $XZYX$,

(4)

(c) the area of the template. (4)

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Question 3 continued

Lined area for writing the answer to Question 3 continued.

Question 3 continued

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Question 3 continued

Handwriting practice area with horizontal lines.

(Total for Question 3 is 10 marks)

4. The point $P(2, 3)$ lies on the curve with equation $y = f(x)$.

State the coordinates of the image of P under the transformation represented by the curve with equation

(a) $y = f(x + 2)$ (1)

(b) $y = -f(x)$ (1)

(c) $2y = f(x)$ (1)

(d) $y = f(x) - 4$ (1)

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Question 4 continued

Handwriting practice area with horizontal lines.

(Total for Question 4 is 4 marks)

5. A curve has equation $y = f(x)$.

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

Given that

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

find

- (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,

(2)

- (b) $f(x)$.

(8)

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Question 5 continued

Lined area for writing the answer to Question 5.

Question 5 continued

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(Total for Question 5 is 10 marks)

6.

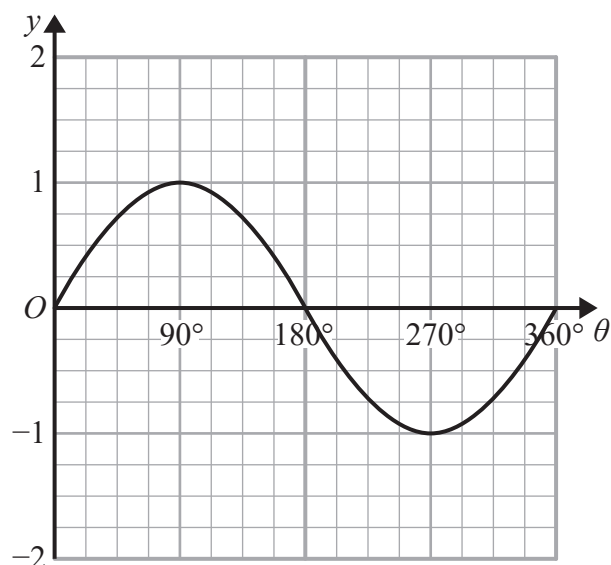


Figure 2

Figure 2 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 2, 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)

Question 6 continued

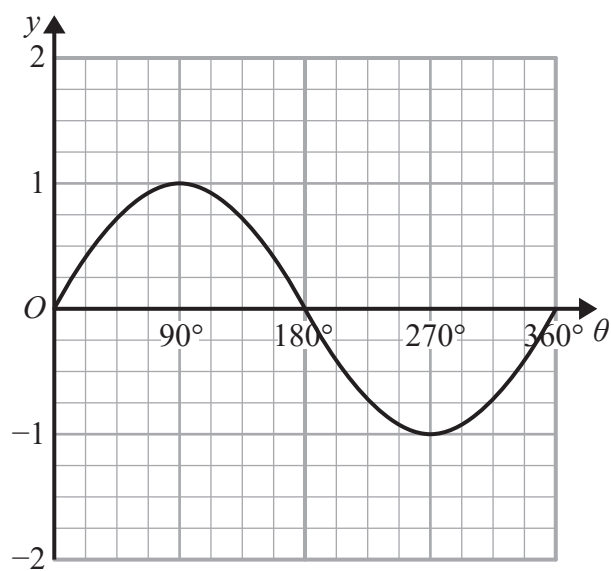


Diagram 1

(Total for Question 6 is 7 marks)

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

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

- (b) Hence find all real solutions of

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

Question 7 continued

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(Total for Question 7 is 7 marks)

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

Given

$$f(x) = 2x^{\frac{5}{2}} - 40x + 8 \quad x > 0$$

- (a) solve the equation $f'(x) = 0$ (4)

- (b) solve the equation $f''(x) = 5$ (3)

Question 8 continued

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(Total for Question 8 is 7 marks)

9. Given that

$$y = \frac{64x^6}{25}, \quad x > 0$$

express each of the following in the form kx^n where k and n are constants.

(a) $y^{\frac{1}{2}}$

(3)

(b) $(25y)^{\frac{2}{3}}$

(2)

Question 9 continued

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(Total for Question 9 is 5 marks)

10. Find the range of values of x for which

(a) $4(x - 2) \leq 2x + 1$ (2)

(b) $(2x - 3)(x + 5) > 0$ (3)

(c) **both** $4(x - 2) \leq 2x + 1$ **and** $(2x - 3)(x + 5) > 0$ (1)

Question 10 continued

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(Total for Question 10 is 6 marks)

11.

$$f(x) = 3x^2 + x - \frac{4}{\sqrt{x}} + 6x^{-3}, \quad x > 0$$

Find $\int f(x) dx$, simplifying each term.

(5)

Question 11 continued

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(Total for Question 11 is 5 marks)

TOTAL FOR PAPER IS 75 MARKS