

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

WMA12/01

Mathematics

International Advanced Subsidiary/Advanced Level
Pure Mathematics P2

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.
- 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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Q1

(Total 7 marks)

Q1

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

The curve C has equation

$$y = 27x^{\frac{1}{2}} - x^{\frac{3}{2}} - 20 \quad x > 0$$

- (a) Find $\frac{dy}{dx}$, giving each term in simplest form. (2)
- (b) Hence find the coordinates of the stationary point of C . (4)
- (c) Find $\frac{d^2y}{dx^2}$ and hence determine the nature of the stationary point of C . (2)

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Question 2 continued

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Q2

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Question 3 continued

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Q3

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4. Using the laws of logarithms, solve

$$\log_3(32 - 12x) = 2\log_3(1 - x) + 3$$

(5)

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Q4

(Total 5 marks)



5.

where A and B are integers.

Given that

- when $f(x)$ is divided by $(x - 1)$ the remainder is k
- when $f(x)$ is divided by $(x + 1)$ the remainder is $-10k$
- k is a constant

(a) show that

$$11A + 9B = 83 \quad (3)$$

Given also that $(3x - 2)$ is a factor of $f(x)$,

(b) find the value of A and the value of B . (3)

(c) Hence find the quadratic expression $g(x)$ such that

$$f(x) = (3x - 2)g(x) \tag{2}$$

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(Total 8 marks)**Q5**

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Question 6 continued

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Q6

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Question 7 continued

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Question 8 continued

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Question 8 continued

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Question 8 continued

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Q8

(Total 9 marks)



9.

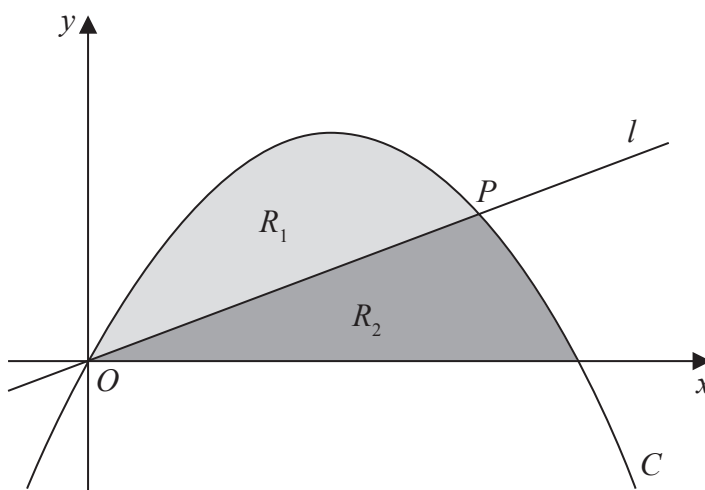
**Figure 2**

Figure 2 shows

- the curve C with equation $y = x - x^2$
- the line l with equation $y = mx$, where m is a constant and $0 < m < 1$

The line and the curve intersect at the origin O and at the point P .

- (a) Find, in terms of
- m
- , the coordinates of
- P
- .

(2)The region R_1 , shown shaded in Figure 2, is bounded by C and l .

- (b) Show that the area of
- R_1
- is

$$\frac{(1-m)^3}{6}$$

(5)The region R_2 , also shown shaded in Figure 2, is bounded by C , the x -axis and l .Given that the area of R_1 is equal to the area of R_2

- (c) find the exact value of
- m
- .

(3)

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Question 9 continued

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Q9

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10. (i) Prove by counter example that the statement

“if p is a prime number then $2p + 1$ is also a prime number”

is not true.

(1)

(ii) Use proof by exhaustion to prove that if n is an integer then

$$5n^2 + n + 12$$

is always even.

(4)

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Q10

(Total 5 marks)

END

TOTAL FOR PAPER IS 75 MARKS