Please check the examination details be	elow before ente	ering your candidate	information	
Candidate surname		Other names		
Centre Number Candidate N	lumber			
Pearson Edexcel Inter	rnation	al Advan	ced Level	
Time 1 hour 30 minutes	Paper reference	WMA	11/01	
Mathematics				
International Advanced S	ubsidiar	v/Advanced	l Level	
Pure Mathematics P1	an Sidiai	<i>,,,,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Pule Mathematics P1				
You must have: Mathematical Formulae and Statistic	cal Tables (Ye	llow), 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.

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1. Find

$$\int \left(\frac{8x^3}{5} - \frac{2}{3x^4} - 1\right) \mathrm{d}x$$

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(Total 4 marks)	



- 2. $f(x) = 11 4x 2x^2$
 - (a) Express f(x) in the form

$$a + b(x + c)^2$$

where a, b and c are integers to be found.

(3)

(b) Sketch the graph of the curve C with equation y = f(x), showing clearly the coordinates of the point where the curve crosses the y-axis.

(2)

(c) Write down the equation of the line of symmetry of C.

(1)

Question 2 continued	Leave blank	;
	Q2	
(Total 6	marks)	_



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

Solutions relying on calculator technology are not acceptable.

(i)

$$f(x) = (x + \sqrt{2})^2 + (3x - 5\sqrt{8})^2$$

Express f(x) in the form $ax^2 + bx\sqrt{2} + c$ where a, b and c are integers to be found.

(3)

(ii) Solve the equation

$$\sqrt{3}\left(4y - 3\sqrt{3}\right) = 5y + \sqrt{3}$$

giving your answer in the form $p+q\sqrt{3}$ where p and q are simplified fractions to be found.

(4)

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Question 3 continued

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4.

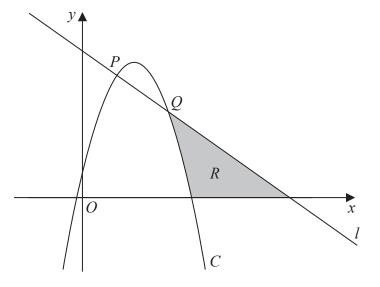


Figure 1

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

Solutions relying on calculator technology are not acceptable.

Figure 1 shows a line l with equation x + y = 6 and a curve C with equation $y = 6x - 2x^2 + 1$

The line l intersects the curve C at the points P and Q as shown in Figure 1.

(a) Find, using algebra, the coordinates of P and the coordinates of Q.

(4)

The region R, shown shaded in Figure 1, is bounded by C, l and the x-axis.

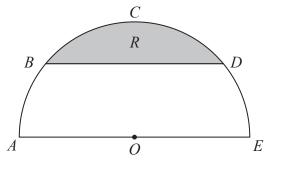
(b) Use inequalities to define the region R.

(3)

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5.



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Figure 2

Figure 2 shows a plan view of a semicircular garden ABCDEOA

The semicircle has

- centre O
- diameter AOE
- radius 3 m

The straight line BD is parallel to AE and angle BOA is 0.7 radians.

(a) Show that, to 4 significant figures, angle *BOD* is 1.742 radians.

(1)

The flowerbed R, shown shaded in Figure 2, is bounded by BD and the arc BCD.

(b) Find the area of the flowerbed, giving your answer in square metres to one decimal place.

(3)

(c) Find the perimeter of the flowerbed, giving your answer in metres to one decimal place.

(3)



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Question 5 continued	



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	Q5
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6. The curve C has equation y = f(x) where x > 0

Given that

$$\bullet \qquad f'(x) = \frac{(x+3)^2}{x\sqrt{x}}$$

- the point P(4, 20) lies on C
- (a) (i) find the value of the gradient at P
 - (ii) Hence find the equation of the tangent to C at P, giving your answer in the form ax + by + c = 0 where a, b and c are integers to be found.

(4)

(b)	Find	f(x),	simp	lifying	your	answer.
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7.

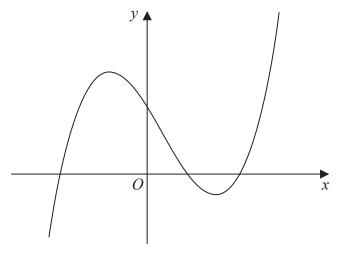


Figure 3

Figure 3 shows a sketch of part of the curve with equation y = f(x), where

$$f(x) = (x+4)(x-2)(2x-9)$$

Given that the curve with equation y = f(x) - p passes through the point with coordinates (0, 50)

(a) find the value of the constant p.

(2)

Given that the curve with equation y = f(x + q) passes through the origin,

(b) write down the possible values of the constant q.

(2)

(c) Find f'(x).

(4)

(d) Hence find the range of values of x for which the gradient of the curve with equation y = f(x) is less than -18

(3)

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	Q7
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8. The line l_1 has equation

$$2x - 5y + 7 = 0$$

(a) Find the gradient of l_1

(1)

Given that

- the point A has coordinates (6, -2)
- the line l_2 passes through A and is perpendicular to l_1
- (b) find the equation of l_2 giving your answer in the form y = mx + c, where m and c are constants to be found.

(3)

The lines l_1 and l_2 intersect at the point M.

(c) Using algebra and showing all your working, find the coordinates of M.

(Solutions relying on calculator technology are not acceptable.)

(3)

Given that the diagonals of a square ABCD meet at M,

(d) find the coordinates of the point C.

(2)



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9.

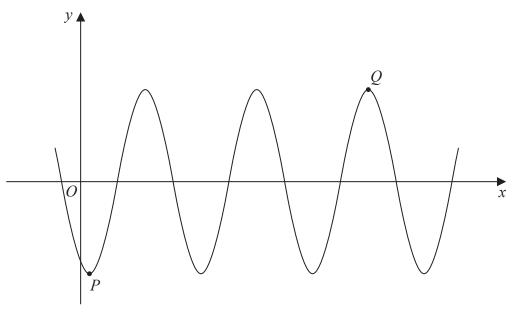


Figure 4

Figure 4 shows part of the curve with equation

$$y = A\cos(x - 30)^{\circ}$$

where A is a constant.

The point P is a minimum point on the curve and has coordinates (30, -3) as shown in Figure 4.

(a) Write down the value of A.

(1)

The point Q is shown in Figure 4 and is a maximum point.

(b) Find the coordinates of Q.

(3)

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10. The curve C has equation

$$y = \frac{1}{x^2} - 9$$

(a) Sketch the graph of *C*.

On your sketch

- show the coordinates of any points of intersection with the coordinate axes
- state clearly the equations of any asymptotes

(4)

The curve *D* has equation $y = kx^2$ where *k* is a constant.

Given that C meets D at 4 distinct points,

(b) find the range of possible values for k.

(5)



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Question 10 continued	



(Total 9 marks

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