Paper Refe	erence (c	ompl	ete b	elow))	Centre No.		Surname	, v		
						Candidate No.		Signature			
Paper Reference(s)									Examiner'	s use only	

6664

Edexcel GCE Pure Mathematics C2 Advanced Subsidiary Specimen Paper

Time:	1	hour	30	minutes
I IIII C.	-	HOGI	\mathcal{L}	IIIIIIACOS

Materials required for examination	Items included with question papers
_	Nil

Candidates may use any calculator EXCEPT those with the facility for symbolic algebra, differentiation and/or integration. Thus candidates may NOT use calculators such as the Texas Instruments TI 89, TI 92, Casio CFX 9970G, Hewlett Packard HP 48G..

Instructions to Candidates

Tour candidate details are printed next to the bar code above. Check that these are correct and sign your name in the signature box above.

If your candidate details are incorrect, or missing, then complete ALL the boxes above. When a calculator is used, the answer should be given to an appropriate degree of accuracy. You must write your answer for each question in the space following the question.

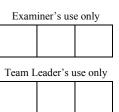
If you need more space to complete your answer to any question, use additional answer sheets

Information for Candidates

A booklet 'mathematical Formulae and Statistical Tables' is provided. Full marks may be obtained for answers to ALL questions. This paper has 9 questions.

Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled. You must show sufficient working to make your methods clear to the examiner. Answers without working may gain no credit



Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

1. Find the first 3 terms, in ascending powers of x, of the binomial expansion of $(2 + 3x)^6$.	Leave blank
(4)	

Find an equation for C. (4)

	x	1	1.5	2	2.5	3		
	у	1.414	2.092	3.000			1	
Calculate, Use the vi 2 decimal	alues fro	m the tal	ole and y					
								(4)
•••••					•••••			••••••
		• • • • • • • • • • • • • • • • • • • •		•••••				
•••••		• • • • • • • • • • • • • • • • • • • •		•••••				
		• • • • • • • • • • • • • • • • • • • •						
	•••••	•••••				• • • • • • • • • • • • • • • • • • • •		
		•••••						
		• • • • • • • • • • • • • • • • • • • •		•••••	•••••			
	•••••	•••••						
		•••••				•••••		

4. Solve, for $0 \le x < 360^\circ$, the equation	Le
$3\sin^2 x = 1 + \cos x,$	
giving your answers to the nearest degree. (7)	

Leave 5. Figure 1 blank 8 mm8 mm 8 mm 8 mm The shaded area in Fig. 1 shows a badge ABC, where AB and AC are straight lines, with AB = AC = 8 mm. The curve BC is an arc of a circle, centre O, where OB = OC = 8 mm and O is in the same plane as ABC. The angle BAC is 0.9 radians. (a) Find the perimeter of the badge. **(2)** (b) Find the area of the badge. **(5)**

Leave blank

6.	At the beginning of the year 2000 a company bought a new machine for £15 000. Each year the value of the machine decreases by 20% of its value at the start of the year.	Leave blank
	(a) Show that at the start of the year 2002, the value of the machine was £9600. (2)	
	When the value of the machine falls below £500, the company will replace it.	
	(b) Find the year in which the machine will be replaced. (4)	
	To plan for a replacement machine, the company pays £1000 at the start of each year into a savings account. The account pays interest at a fixed rate of 5% per annum. The first payment was made when the machine was first bought and the last payment will be made at the start of the year in which the machine is replaced.	
	(c) Using your answer to part (b), find how much the savings account will be worth immediately after the payment at the start of the year in which the machine is replaced.	
	(4)	
•••••		

 Leave

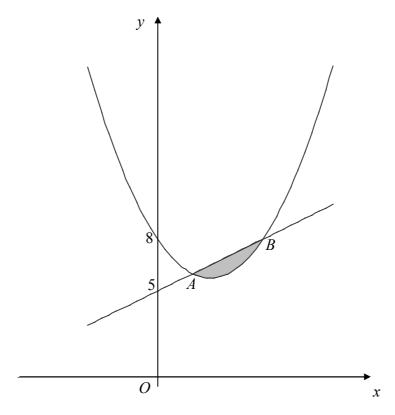
7. (a) Use the factor theorem to show that $(x + 1)$ is a factor of		Leave
$x^3 - x^2 - 10x - 8$.	<i>y</i> =-	
(b) Find all the solutions of the equation $x^3 - x^2 - 10x - 8 = 0$.	(2) (4)	
(c) Prove that the value of x that satisfies		
$2 \log_2 x + \log_2 (x - 1) = 1 + \log_2 (5x + 4) $ (I)		
is a solution of the equation		
$x^3 - x^2 - 10x - 8 = 0.$	(4)	
(d) State, with a reason, the value of x that satisfies equation (I).	(2)	
	••••••	
	•••••	
	••••••	

Leave blank

8.



Leave blank



The line with equation y = x + 5 cuts the curve with equation $y = x^2 - 3x + 8$ at the points A and B, as shown in Fig. 2.

(a) Find the coordinates of the points A and B.

(5)

(b) Find the area of the shaded region between the curve and the line, as shown in Fig. 2.

(7)

•••••		
•••••	•••••	
	•••••	

Leave blank

9.

Figure 3

Leave blank

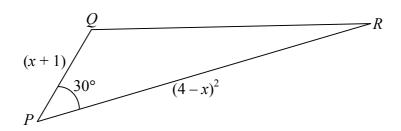


Figure 3 shows a triangle PQR. The size of angle QPR is 30°, the length of PQ is (x+1) and the length of PR is $(4-x)^2$, where $x \in \mathbb{R}$.

(a) Show that the area A of the triangle is given by

$$A = \frac{1}{4}(x^3 - 7x^2 + 8x + 16).$$

(3)

(b) Use calculus to prove that the area of $\triangle PQR$ is a maximum when $x = \frac{2}{3}$. Explain clearly how you know that this value of x gives the maximum area.

(6)

(c) Find the maximum area of ΔPQR .

(1)

(d) Find the length of QR when the area of ΔPQR is a maximum.

(3)

	_			
	Leave blank			
END				