Centre No.						Pape	r Refer	ence			Surname	Initial(s)
Candidate No.	;			6	6	6	3	/	0	1	Signature	

Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1 Advanced Subsidiary



Examiner's use only							
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Team L	eade	r's u	ise only				
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Ouestion

Wednesday 10 January 2007 – Afternoon Time: 1 hour 30 minutes

Mathematical Formulae (Green)

Items included with question papers

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Calculators may NOT be used in this examination.

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Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.

Check that you have the correct question paper.

You must write your answer for each question in the space following the question.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 10 questions in this question paper. The total mark for this question paper is 75.

There are 20 pages in this question paper. Any blank pages are indicated.

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.

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Total



Civan that		
Given that	$y = 4x^3 - 1 + 2x^{\frac{1}{2}}, x > 0,$	
dv	y = 4x - 1 + 2x, $x > 0$,	
find $\frac{\mathrm{d}y}{\mathrm{d}x}$.		
		(4)
		(Total 4 marks)

(a) Express $\sqrt{108}$ in the form $a\sqrt{3}$, where a is an integer.	(1)
(b) Express $(2 - \sqrt{3})^2$ in the form $b + c\sqrt{3}$, where b and c are integers to be found.	
	(3)



3. Given that

$$f(x) = \frac{1}{x}, \quad x \neq 0,$$

(a) sketch the graph of y = f(x) + 3 and state the equations of the asymptotes.

(4)

(b) Find the coordinates of the point where y = f(x) + 3 crosses a coordinate axis.

(2)

		Leave blank
4. Solve the simultaneous equations		Dialik
4. Solve the simultaneous equations		
	y = x - 2,	
	$y^2 + x^2 = 10.$	
	(7)	



Find the set of possible values of k .	
	(4)

found.	(2)
b) Find $\int (4+3\sqrt{x})^2 dx$.	
J	(3)



Leave blank

7. The curve C has equation y = f(x), $x \ne 0$, and the point P(2, 1) lies on C. Given that

$$f'(x) = 3x^2 - 6 - \frac{8}{x^2},$$

(a) find f(x).

(5)

(b) Find an equation for the tangent to C at the point P, giving your answer in the form y = mx + c, where m and c are integers.

(4)

10

Leave
blank

- **8.** The curve *C* has equation $y = 4x + 3x^{\frac{3}{2}} 2x^2$, x > 0.
 - (a) Find an expression for $\frac{dy}{dx}$.

(3)

(b) Show that the point P(4, 8) lies on C.

(1)

(c) Show that an equation of the normal to C at the point P is

$$3y = x + 20$$
.

(4)

The normal to C at P cuts the x-axis at the point Q.

(d) Find the length PQ, giving your answer in a simplified surd form.

(3)



Question 8 continued	



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9.	Ann has some sticks that are all of the same length. She arranges them in squares and has made the following 3 rows of patterns:			
	Row 1	0		
	Row 2			
	Row 3			
		es that 4 sticks are required to make the single square in the first row, 7 sticks to make in the second row and in the third row she needs 10 sticks to make it		
		an expression, in terms of n , for the number of sticks required to make a similar gement of n squares in the n th row.	ır	
		(3	6)	
		nues to make squares following the same pattern. She makes 4 squares in the ad so on until she has completed 10 rows.	e	
	(b) Find t	he total number of sticks Ann uses in making these 10 rows.		
		(3	6)	
	Ann started with 1750 sticks. Given that Ann continues the pattern to complete k rows but does not have sufficient sticks to complete the $(k+1)$ th row,			
	(c) show	that k satisfies $(3k-100)(k+35) < 0$.	6)	
		the value of k .		
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Question 9 continued	P



- 10. (a) On the same axes sketch the graphs of the curves with equations
 - (i) $y = x^2(x-2)$,

(3)

(ii)
$$y = x(6-x)$$
,

(3)

and indicate on your sketches the coordinates of all the points where the curves cross the x-axis.

(b) Use algebra to find the coordinates of the points where the graphs intersect.

(7)

		Q10
	(Total 13 marks)	
TOTAL FO	R PAPER: 75 MARKS	