Centre No.					Раре	er 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**

Monday 21 May 2007 – Morning

Time: 1 hour 30 minutes



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Examiner's use only

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Materials required for examination	Items included with question papers
Mathematical Formulae (Green)	Nil

Calculators may NOT be used in this examination.

#### **Instructions to Candidates**

In the boxes above, write your centre number, candidate number, your surname, initials 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 11 questions in this question paper. The total mark for this paper is 75.

There are 24 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 should show sufficient working to make your methods clear to the Examiner. Answers without working may not gain full credit.

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http://www.xtremepapers.net

Simplify $(3 + \sqrt{5})(3 - \sqrt{5})$ .	(2)

	Leave blank
2. (a) Find the value of $8^{\frac{4}{3}}$ .	
(b) Simplify $\frac{15x^{\frac{4}{3}}}{3x}$ . (2)	
	02
(Total 4 marks)	Q2

H 2 6 1 0 7 A 0 3 2 4

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3. Given that $y = 3x^2 + 4\sqrt{x}$ , $x > 0$ , find	
3. Given that $y = 5x^2 + 4 \sqrt{x}, x > 0$ , find	
dy	
(a) $\frac{dy}{dx}$ ,	
$\mathbf{d}x$	(2)
.2	
(b) $\frac{d^2y}{d^2y}$	
(b) $\frac{d^2y}{dx^2}$ ,	(2)
<del></del>	(2)
(c) $\int y  dx$ .	
(c) $\int y dx$ .	
J	(3)
	, ,

uestion 3 continued	Lea blai
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	Q3

equence.	
a) Find the amount she saves in Week 200.	
	(3)
b) Calculate her total savings over the complete 200 week period.	
b) Carediate her total savings over the complete 200 week period.	(3)

	Leave blank
Question 4 continued	
	Q4
(Total 6 marks)	

5.

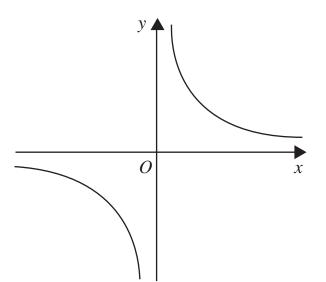


Figure 1

Figure 1 shows a sketch of the curve with equation  $y = \frac{3}{x}$ ,  $x \ne 0$ .

- (a) On a separate diagram, sketch the curve with equation  $y = \frac{3}{x+2}$ ,  $x \ne -2$ , showing the coordinates of any point at which the curve crosses a coordinate axis.
- (b) Write down the equations of the asymptotes of the curve in part (a).

(2)

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	Q5

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6.	(a)	By eliminating <i>y</i> from the equations	
		y = x - 4,	
		$2x^2 - xy = 8,$	
		show that	
		$x^2 + 4x - 8 = 0.$	
			(2)
	(b)	Hence, or otherwise, solve the simultaneous equations	
		y = x - 4,	
		$2x^2 - xy = 8,$	
		giving your answers in the form $a \pm b\sqrt{3}$ , where a and b are integers.	
			(5)
			_

	Leave blank
Question 6 continued	
	<b>Q6</b>
(Total 7 marks)	

(a) Show that $k^2 - 4k - 12 > 0$ .	
(a) Show that k 1 12 2 0.	(2)
(b) Find the set of possible values of $k$ .	(4)

Question 7 continued	Leav
guestion / continued	
	Q7

Leave	
blank	

<b>o.</b>	A sequence	$a_1, a_2, a_3, \dots$	is defined by

$$a_1 = k$$
,

$$a_{n+1}=3a_n+5, n\geqslant 1,$$

where k is a positive integer.

(a) Write down an expression for  $a_2$  in terms of k.

**(1)** 

(b) Show that  $a_3 = 9k + 20$ .

**(2)** 

(c) (i) Find  $\sum_{r=1}^{4} a_r$  in terms of k.

(ii) Show that  $\sum_{r=1}^{4} a_r$  is divisible by 10.

(4)	


uestion 8 continued	Lea blai
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	Q8

	The curve C with equation $y = f(x)$ passes through the point $(5, 65)$ .
	Given that $f'(x) = 6x^2 - 10x - 12$ ,
	(a) use integration to find $f(x)$ .
	(4)
	(b) Hence show that $f(x) = x(2x+3)(x-4)$ . (2)
	(c) In the space provided on page 17, sketch $C$ , showing the coordinates of the points
	where $C$ crosses the $x$ -axis. (3)
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Question 9 continued	Leave blank
	<b>Q9</b>
(Total 9 marks)	

<ul> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>	<ul> <li>(a) Show that the length of PQ is √170.</li> <li>(4)</li> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(5)</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>		e curve C has equation $y = x^2(x-6) + \frac{4}{x}$ , $x > 0$ .	
<ul> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>	<ul> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>	The	points P and Q lie on C and have x-coordinates 1 and 2 respectively.	
<ul> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>	<ul> <li>(b) Show that the tangents to C at P and Q are parallel.</li> <li>(c) Find an equation for the normal to C at P, giving your answer in the form ax + by + c = 0, where a, b and c are integers.</li> </ul>	(a)	Show that the length of $PQ$ is $\sqrt{170}$ .	<i>(</i> <b>4</b> )
(c) Find an equation for the normal to $C$ at $P$ , giving your answer in the form $ax + by + c = 0$ , where $a$ , $b$ and $c$ are integers.	(c) Find an equation for the normal to $C$ at $P$ , giving your answer in the form $ax + by + c = 0$ , where $a$ , $b$ and $c$ are integers.			(4)
(c) Find an equation for the normal to $C$ at $P$ , giving your answer in the form $ax + by + c = 0$ , where $a$ , $b$ and $c$ are integers.	(c) Find an equation for the normal to $C$ at $P$ , giving your answer in the form $ax + by + c = 0$ , where $a$ , $b$ and $c$ are integers.	(b)	Show that the tangents to $C$ at $P$ and $Q$ are parallel.	(5)
ax + by + c = 0, where a, b and c are integers.	ax + by + c = 0, where a, b and c are integers.	<i>(</i> )		
		(c)		form
				(4)

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Question 10 continued	blank
Question to continued	

Question 10 continued	Leave blank
Question to continued	
	Q10
(Total 13 marks)	

The line $l_1$ has equation $y = 3x + 2$ and the line $l_2$ has equation $3x + 2y - 8 =$	0.
	· ·
(a) Find the gradient of the line $l_2$ .	(2)
	(-)
The point of intersection of $l_1$ and $l_2$ is $P$ .	
(b) Find the coordinates of <i>P</i> .	(3)
The lines $l_1$ and $l_2$ cross the line $y = 1$ at the points A and B respectively.	
(c) Find the area of triangle <i>ABP</i> .	(4)
	(4)

Question 11 continued	Leave blank

Question 11 continued		blan
		Q1
	(Total 9 marks)	
	TOTAL FOR PAPER: 75 MARKS	
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