Centre No.			Paper Reference				Surname	Initial(s)			
Candidate No.			6	6	6	5	/	0	1	Signature	

### 6665/01

## **Edexcel GCE**

# **Core Mathematics C3**

Advanced

Friday 6 June 2008 – Afternoon

Time: 1 hour 30 minutes

Materials required for examination

Items included with question papers

Mathematical Formulae (Green)

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable

#### **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.

Answer ALL the questions.

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

When a calculator is used, the answer should be given to an appropriate degree of accuracy.

#### **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 7 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.

This publication may be reproduced only in accordance with Edexcel Limited copyright policy ©2008 Edexcel Limited



Turn over

Examiner's use only

Team Leader's use only

Question

1

2

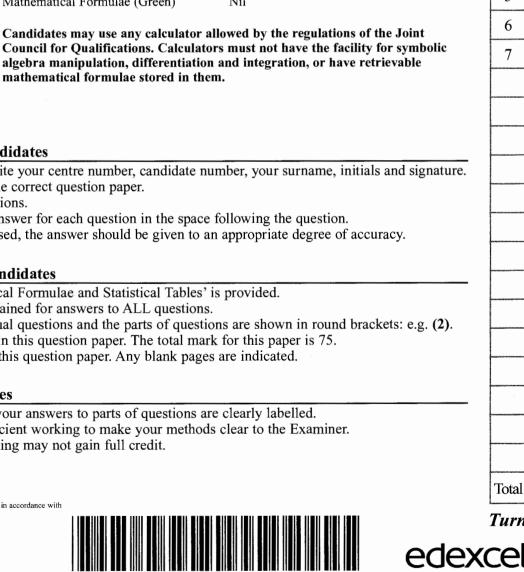
3

4

5







W850/R6665/57570 3/3/3/3

1.	The point $P$ lies on the curve with equation
	$v = 4e^{2x+1}$

The y-coordinate of P is 8.

(a) Find, in terms of ln 2, the x-coordinate of P.

**(2)** 

(b) Find the equation of the tangent to the curve at the point P in the form y = ax + b, where a and b are exact constants to be found.

(4)

			THE COLUMN THE PERSON OF THE P
	distribution and the second		
			TO PROVIDE THE PROPERTY OF THE
<u> </u>			AND TO SERVICE STATE OF THE SE
		and the state of t	SW Returned Tribe (1999) Free
		A CONTRACTOR OF THE CONTRACTOR	Note the control of the state o
			Delication of the State of the
			TREAT EXPENSE NO. 10 CONTRACTOR STATEMENT OF THE STATEMEN

estion 1 continued	
	Transcension of AMALA Control (Control



_	
7	
•	
_	

$$f(x) = 5\cos x + 12\sin x$$

Given that  $f(x) = R\cos(x - \alpha)$ , where R > 0 and  $0 < \alpha < \frac{\pi}{2}$ ,

(a) find the value of R and the value of  $\alpha$  to 3 decimal places.

**(4)** 

(b) Hence solve the equation

$$5\cos x + 12\sin x = 6$$

for  $0 \le x < 2\pi$ .

**(5)** 

(c) (i) Write down the maximum value of  $5\cos x + 12\sin x$ .

**(1)** 

(ii) Find the smallest positive value of x for which this maximum value occurs.

**(2)** 



Question 2 continued	Le bl
	ea-finacionas nascentifición
	**************************************
	***************************************
	100000000000000000000000000000000000000
	CALADO PROPERTY OF THE PROPERT
	AND THE RESIDENCE OF THE PERSON NAMED IN COLUMN NAMED IN COLUM
	THE STATE OF THE S
	THE STREET STREET, STR
	Necessian des services de la constantina della c
	***************************************

estion 2 continued	



3.

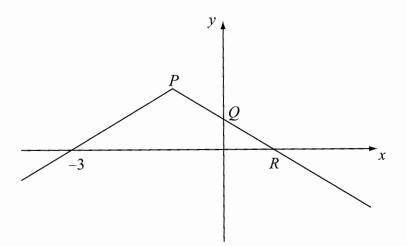


Figure 1

Figure 1 shows the graph of y = f(x),  $x \in \mathbb{R}$ .

The graph consists of two line segments that meet at the point P.

The graph cuts the y-axis at the point Q and the x-axis at the points (-3, 0) and R. Sketch, on separate diagrams, the graphs of

(a) y = |f(x)|,

(2)

Leave blank

(b) y = f(-x).

**(2)** 

Given that f(x) = 2 - |x + 1|,

(c) find the coordinates of the points P, Q and R,

(3)

(d) solve  $f(x) = \frac{1}{2}x$ .

(5)



	-
Question 3 continued	0.00
	-
	-
	-
	and the second
	-
	Contract of the last
	No. of Persons in Contract of
	Property of the Parket
	Processor specialization
	The state of the s
	anna de la companya d
	distance and the
	And the second s
	-
	-
	of the latest spin service of the latest spin se
	and the same of th
	No. of Concession, Name of Street, or other Persons, Name of Street, or ot
	The second second
	The state of the s



4. The function f is defined by

$$f: x \mapsto \frac{2(x-1)}{x^2 - 2x - 3} - \frac{1}{x - 3}, \quad x > 3.$$

(a) Show that  $f(x) = \frac{1}{x+1}$ , x > 3.

**(4)** 

(b) Find the range of f.

**(2)** 

(c) Find  $f^{-1}(x)$ . State the domain of this inverse function.

(3)

The function g is defined by

$$g: x \mapsto 2x^2 - 3, \quad x \in \mathbb{R}.$$

(d) Solve  $fg(x) = \frac{1}{8}$ .

(3)

	Leave
Question 4 continued	blank
	THE PERSONAL PROPERTY.
	100 Marie 100 Ma
	TANGE SERVICE
	Principal (This of Presences
	egenesson control of the control of
	5 P
	No. of Control of Cont
	Security (Constitution)
	***
	40
	and the second s
	Name and the city of the city
	*
	A STATE OF THE STA
	The state of the s



	Leave blank
Question 4 continued	ALL AND
	Control of the Contro
	errenalisējes renaukte
	NAME OF TAXABLE PARTY.
	ATTACAMA OF THE STATE OF THE ST
	The state of the s
	The state of the s
	***************************************
	SANCTIFICATION ASSESSMENT
	Service Control of the Control of th
	AND THE RESIDENCE OF THE PARTY
	SAPAGE LAW INCOME.
	The state of the s
	Principle of the Princi
	A STATE OF THE STA
	-

estion 4 continued
1



Leave	
blank	

5. (a) Given that $\sin^2\theta + \cos^2\theta \equiv 1$ , show that $1 + \cot^2\theta \equiv \csc^2\theta$ .	(2)
(b) Solve, for $0 \le \theta < 180^{\circ}$ , the equation	
$2 \cot^2 \theta - 9 \csc \theta = 3$ ,	
giving your answers to 1 decimal place.	
	(6)
	(MINISTERNAL)
	NUMBER OF STREET
	ERS TO THE ME
	Malatan program
	MINISTER STATE OF THE STATE OF
	mbrane
	adaday wa
	Norman and American
	100 To
	TO THE REAL PROPERTY.
	MARINE STATE
	marine An
	proprietario
	Marian

	Leave
Question 5 continued	blank
Question 5 continued	
	**************************************
	gg-
	Oliver and the second
	Section 2
	and coloring to the color
	-
	Q5
(Total 8 marks)	





estion 6 continued	
continued	
	ners destruit in growth and the second of th
	10 to
	AND THE PROPERTY OF THE PROPER

	Leave blank
Question 6 continued	Dialik
	THE STATE OF THE S
	***************************************
	Proper strategy (special strategy)
	Mayor of the same
	1 1 1 1 1
	and the second control
	00
	Q6
(Total 14 marks)	

7.

$$f(x) = 3x^3 - 2x - 6$$

(a) Show that f(x) = 0 has a root,  $\alpha$ , between x = 1.4 and x = 1.45

**(2)** 

(b) Show that the equation f(x) = 0 can be written as

$$x = \sqrt{\left(\frac{2}{x} + \frac{2}{3}\right)}, \quad x \neq 0.$$

**(3)** 

(c) Starting with  $x_0=1.43$ , use the iteration

$$x_{n+1} = \sqrt{\left(\frac{2}{x_n} + \frac{2}{3}\right)}$$

to calculate the values of  $x_1$ ,  $x_2$  and  $x_3$ , giving your answers to 4 decimal places.

(3)

(d) By choosing a suitable interval, show that  $\alpha = 1.435$  is correct to 3 decimal places.

**(3)** 

-
-
anno Anna Marana (1)
••••
-
renesiati
,

	Leave blank
Question 7 continued	
	STATE OF THE PROPERTY OF THE P
	N-8-00
	and the second s
	Avid-ver-ver-ver-ver-ver-ver-ver-ver-ver-ver
	A CONTRACTOR OF THE CONTRACTOR
	16 cm
	- A CANADA CONTRACTOR
	1000 1000 1000 1000 1000 1000 1000 100
· · · · · · · · · · · · · · · · · · ·	
	No. of Control of Cont
	упсилонення
	STATE OF THE CONTRACTOR OF THE
	**************************************
	***



estion 7 continued	
The state of the s	
	(Total 11 marks)
	TOTAL FOR PAPER: 75 MARKS

- **6.** (a) Differentiate with respect to x,
  - (i)  $e^{3x}(\sin x + 2\cos x)$ ,

(3)

(ii)  $x^3 \ln (5x+2)$ .

**(3)** 

Given that  $y = \frac{3x^2 + 6x - 7}{(x+1)^2}$ ,  $x \ne -1$ ,

(b) show that  $\frac{dy}{dx} = \frac{20}{(x+1)^3}$ .

(5)

(c) Hence find  $\frac{d^2y}{dx^2}$  and the real values of x for which  $\frac{d^2y}{dx^2} = -\frac{15}{4}$ .

(3)