**Mathematics C1** 

Past Paper

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Centre No.				Paper Reference					Surname	Initial(s)	
Candidate No.			6	6	6	3	/	0	1	Signature	

Paper Reference(s)

## 6663/01

## **Edexcel GCE**

# **Core Mathematics C1 Advanced Subsidiary**

Wednesday 13 May 2015 - Morning

Time: 1 hour 30 minutes



Team Leader's use only					

Question

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Examiner's use only

Materials required for examination

Mathematical Formulae (Pink)

Items included with question papers

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.

Answer ALL the questions.

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 paper is 75.

There are 32 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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•	Simplify	
	(a) $(2\sqrt{5})^2$	(1)
	(b) $\frac{\sqrt{2}}{2\sqrt{5-3}\sqrt{2}}$ giving your answer in the form $a + \sqrt{b}$ , where a and	
	(b) $\frac{1}{2\sqrt{5-3}\sqrt{2}}$ giving your answer in the form $a + \sqrt{b}$ , where $a$ and	(4)
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	y - 2x - 4 = 0
	$x^2 + y^2 + 20x = 0$
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3.	Given that $y = 4x^3 - 4x^3$	$\frac{5}{x^2}, x \neq 0,$	find in th	neir simplest	form
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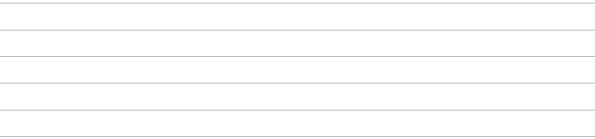
(a) 
$$\frac{\mathrm{d}y}{\mathrm{d}x}$$

**(3)** 

(b) 
$$\int y dx$$

**(3)** 





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**4.** (i) A sequence  $U_1$ ,  $U_2$ ,  $U_3$ , ... is defined by

$$U_{n+2} = 2U_{n+1} - U_n, \quad n \geqslant 1$$

$$U_1 = 4$$
 and  $U_2 = 4$ 

Find the value of

(a)  $U_3$ 

(1)

(b) 
$$\sum_{n=1}^{20} U_n$$

**(2)** 

(ii) Another sequence  $V_1$ ,  $V_2$ ,  $V_3$ , ... is defined by

$$V_{n+2} = 2V_{n+1} - V_n, \quad n \geqslant 1$$

 $V_1 = k$  and  $V_2 = 2k$ , where k is a constant

(a) Find  $V_3$  and  $V_4$  in terms of k.

**(2)** 

Given that  $\sum_{n=1}^{5} V_n = 165,$ 

(b) find the value of k.

**(3)** 

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 $(p-1)x^2 + 4x + (p-5) = 0$ , where p is a constant

has no real roots.

(a) Show that p satisfies  $p^2 - 6p + 1 > 0$ 

**(3)** 

(b) Hence find the set of possible values of p.

**(4)** 



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**6.** The curve *C* has equation

 $y = \frac{(x^2 + 4)(x - 3)}{2x}, \quad x \neq 0$ 

(a) Find  $\frac{dy}{dx}$  in its simplest form.

**(5)** 

(b) Find an equation of the tangent to C at the point where x = -1

Give your answer in the form ax + by + c = 0, where a, b and c are integers.

**(5)** 

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•	Given that $y = 2^x$ ,	
	(a) express $4^x$ in terms of $y$ .	(1)
		(1)
	(b) Hence, or otherwise, solve	
	$8(4^x) - 9(2^x) + 1 = 0$	
		(4)
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<b>8.</b> (a) Factorise completely $9x - 4x^3$	(3)
(b) Sketch the curve <i>C</i> with equation	
y = 9x -	$-4x^{3}$
Show on your sketch the coordinates at	which the curve meets the $x$ -axis. (3)
The points $A$ and $B$ lie on $C$ and have $x$ coor	dinates of –2 and 1 respectively.
(c) Show that the length of $AB$ is $k\sqrt{10}$ wh	here $k$ is a constant to be found. (4)

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10. A curve with equation y = f(x) passes through the point (4, 9).

Given that

$$f'(x) = \frac{3\sqrt{x}}{2} - \frac{9}{4\sqrt{x}} + 2, \quad x > 0$$

(a) find f(x), giving each term in its simplest form.

**(5)** 

Point *P* lies on the curve.

The normal to the curve at P is parallel to the line 2y + x = 0

(b) Find the *x* coordinate of *P*.

**(5)** 

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