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

Paper Reference(s)

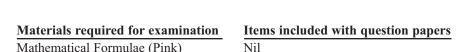
# 6663/01

# **Edexcel GCE**

# **Core Mathematics C1 Advanced Subsidiary**

Friday 13 January 2012 – Morning

Time: 1 hour 30 minutes



Calculators may NOT be used in this examination.

Examiner's use only							
Team Leader's use only							

Question Number	Leave Blank
1	
2	
3	
4	
5	
5 6 7	
7	
8	
9	
10	

## **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 to 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 28 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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Turn over

Total

**PEARSON** 

(a) $\frac{dy}{dx}$	
$\frac{dx}{dx}$	(3)
(b) $\int y  \mathrm{d}x$	(3)



2. (a) Simplify

$$\sqrt{32} + \sqrt{18}$$

giving your answer in the form  $a\sqrt{2}$ , where a is an integer.

**(2)** 

(b) Simplify

$$\frac{\sqrt{32+\sqrt{18}}}{3+\sqrt{2}}$$

giving your answer in the form  $b\sqrt{2}+c$ , where b and c are integers.

**(4)** 



(Total 6 marks)

3. Find the set of values of $x$ for which	
(a) $4x-5 > 15-x$	(2)
(b) $x(x-4) > 12$	(4)



**4.** A sequence  $x_1, x_2, x_3,...$  is defined by

$$x_1 = 1$$

$$x_{n+1} = ax_n + 5, \qquad n \geqslant 1$$

where a is a constant.

(a) Write down an expression for  $x_2$  in terms of a.

(1)

(b) Show that  $x_3 = a^2 + 5a + 5$ 

**(2)** 

Given that  $x_3 = 41$ 

(c) find the possible values of a.

**(3)** 

(Total 6 marks)

Th	e curve C has equation $y = x(5-x)$ and the line L has equation $2y = 5x + 4$	
(a)	Use algebra to show that $C$ and $L$ do not intersect.	(4)
(b)	In the space on page 11, sketch $C$ and $L$ on the same diagram, showing the coordin of the points at which $C$ and $L$ meet the axes.	ates
		(4)

Leave blank

**6.** 

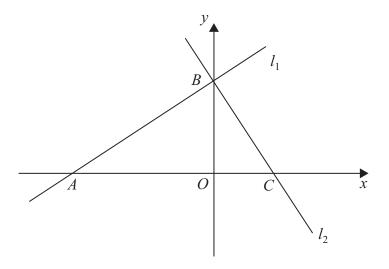


Figure 1

The line  $l_1$  has equation 2x - 3y + 12 = 0

(a) Find the gradient of  $l_1$ .

**(1)** 

The line  $l_1$  crosses the x-axis at the point A and the y-axis at the point B, as shown in Figure 1.

The line  $l_2$  is perpendicular to  $l_1$  and passes through B.

(b) Find an equation of  $l_2$ .

**(3)** 

The line  $l_2$  crosses the x-axis at the point C.

(c) Find the area of triangle ABC.

**(4)** 

12



nestion 6 continued		



(Total 8 marks)

$f'(x) = 3x^2 - 3x + 5$	
find the value of $f(1)$ .	
That the variet of T(1).	(5)



(Total 5 marks)

**8.** The curve  $C_1$  has equation

$$y = x^2(x+2)$$

(a) Find  $\frac{dy}{dx}$ 

**(2)** 

(b) Sketch  $C_1$ , showing the coordinates of the points where  $C_1$  meets the x-axis.

**(3)** 

(c) Find the gradient of  $C_1$  at each point where  $C_1$  meets the x-axis.

**(2)** 

The curve  $C_2$  has equation

$$y = (x-k)^2(x-k+2)$$

where k is a constant and k > 2

(d) Sketch  $C_2$ , showing the coordinates of the points where  $C_2$  meets the x and y axes.

(3)



Question 8 continued	Leave

9.	A company offers two salary schemes for a 10-year period, Year 1 to Year 10 inclusive.

Scheme 1: Salary in Year 1 is  $\pounds P$ .

Salary increases by  $\pounds(2T)$  each year, forming an arithmetic sequence.

Scheme 2: Salary in Year 1 is  $\pounds(P + 1800)$ .

Salary increases by  $\pounds T$  each year, forming an arithmetic sequence.

(a) Show that the total earned under Salary Scheme 1 for the 10-year period is

£
$$(10P + 90T)$$

**(2)** 

For the 10-year period, the **total** earned is the same for both salary schemes.

(b) Find the value of T.

**(4)** 

For this value of *T*, the salary in Year 10 under Salary Scheme 2 is £29 850

(c) Find the value of P.

**(3)** 







(Total 9 marks)

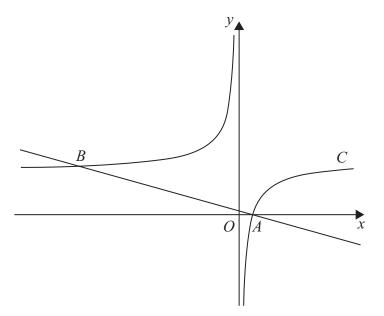


Figure 2

Figure 2 shows a sketch of the curve C with equation

$$y = 2 - \frac{1}{x}, \quad x \neq 0$$

The curve crosses the x-axis at the point A.

(a) Find the coordinates of A.

**(1)** 

(b) Show that the equation of the normal to C at A can be written as

$$2x + 8y - 1 = 0 ag{6}$$

The normal to C at A meets C again at the point B, as shown in Figure 2.

(c) Find the coordinates of B.

**(4)** 



Question 10 continued	blank
	Q1
(Total 11 marks)	
TOTAL FOR PAPER: 75 MARKS	
END	