

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**

Monday 2 June 2008 – Morning

Time: 1 hour 30 minutes



Examiner's use only

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Team Leader's use only

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Question Number	Leave Blank
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Total	

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. 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 11 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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3.

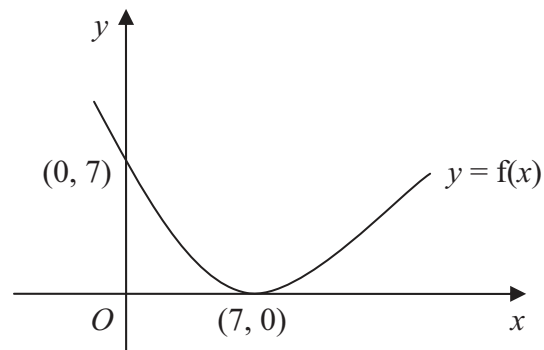


Figure 1

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve passes through the point $(0, 7)$ and has a minimum point at $(7, 0)$.

On separate diagrams, sketch the curve with equation

(a) $y = f(x) + 3$, **(3)**

(b) $y = f(2x)$. **(2)**

On each diagram, show clearly the coordinates of the minimum point and the coordinates of the point at which the curve crosses the y -axis.



Question 3 continued

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(Total 5 marks)

Q3

5

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4. $f(x) = 3x + x^3, \quad x > 0.$

(a) Differentiate to find $f'(x)$. **(2)**

Given that $f'(x) = 15$,

(b) find the value of x . **(3)**



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5. A sequence x_1, x_2, x_3, \dots is defined by

$$x_1 = 1,$$

$$x_{n+1} = ax_n - 3, \quad n \geq 1,$$

where a is a constant.

(a) Find an expression for x_2 in terms of a . (1)

(b) Show that $x_3 = a^2 - 3a - 3$. (2)

Given that $x_3 = 7$,

(c) find the possible values of a . (3)

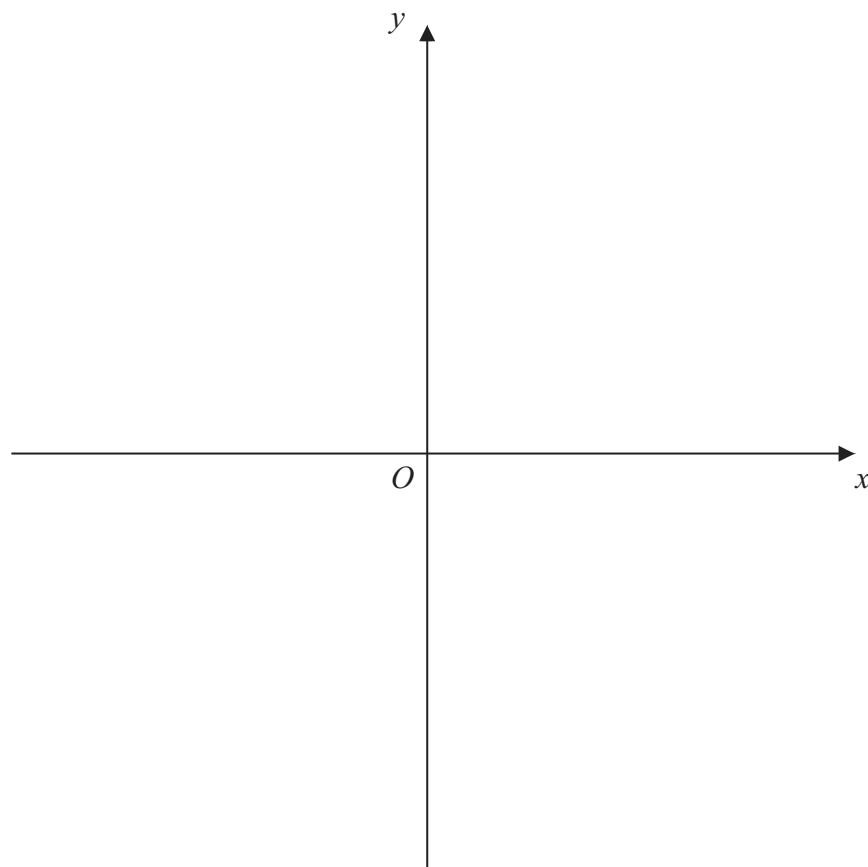


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6. The curve C has equation $y = \frac{3}{x}$ and the line l has equation $y = 2x + 5$.

(a) On the axes below, sketch the graphs of C and l , indicating clearly the coordinates of any intersections with the axes. (3)

(b) Find the coordinates of the points of intersection of C and l . (6)



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Question 6 continued

Lined area for writing the answer to Question 6.

Q6

(Total 9 marks)



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7. Sue is training for a marathon. Her training includes a run every Saturday starting with a run of 5 km on the first Saturday. Each Saturday she increases the length of her run from the previous Saturday by 2 km.

(a) Show that on the 4th Saturday of training she runs 11 km. (1)

(b) Find an expression, in terms of n , for the length of her training run on the n th Saturday. (2)

(c) Show that the total distance she runs on Saturdays in n weeks of training is $n(n + 4)$ km. (3)

On the n th Saturday Sue runs 43 km.

(d) Find the value of n . (2)

(e) Find the total distance, in km, Sue runs on Saturdays in n weeks of training. (2)



Question 9 continued

Lined area for writing the answer to Question 9.

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Q9

(Total 8 marks)



10.

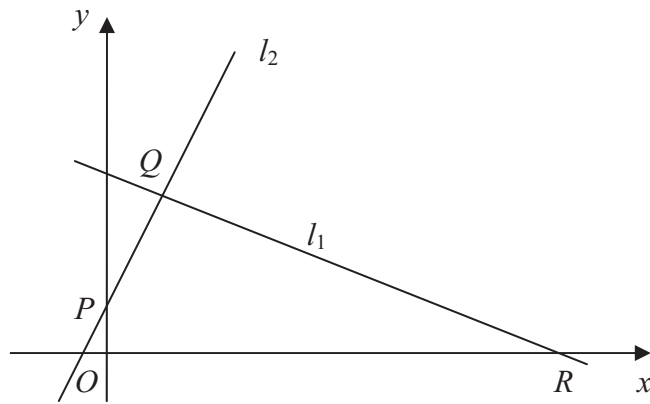


Figure 2

The points $Q(1, 3)$ and $R(7, 0)$ lie on the line l_1 , as shown in Figure 2.

The length of QR is $a\sqrt{5}$.

(a) Find the value of a .

(3)

The line l_2 is perpendicular to l_1 , passes through Q and crosses the y -axis at the point P , as shown in Figure 2.

Find

(b) an equation for l_2 ,

(5)

(c) the coordinates of P ,

(1)

(d) the area of $\triangle PQR$.

(4)





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Question 10 continued

Lined writing area for the answer to Question 10. The area contains 30 horizontal lines.

(Total 13 marks)

Q10



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