

Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						6	6	6	4	/	0	1	Signature	

Paper Reference(s)

6664/01

Edexcel GCE

Core Mathematics C2

Advanced Subsidiary

Thursday 26 May 2011 – Morning
Time: 1 hour 30 minutes

Examiner's use only

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Team Leader's use only

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[illegible]

Materials required for examination

Mathematical Formulae (Pink)

Items included with question papers

Nil

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 or symbolic differentiation/integration, or have retrievable mathematical formulae stored in them.

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 9 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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1.

- (a) Find the remainder when $f(x)$ is divided by $(x-1)$. (2)
- (b) Use the factor theorem to show that $(x+1)$ is a factor of $f(x)$. (2)
- (c) Factorise $f(x)$ completely. (4)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Q1

(Total 8 marks)



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- $$(3 + bx)^5$$

(4)

(2)



Q2

(Total 6 marks)



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3. Find, giving your answer to 3 significant figures where appropriate, the value of x for which

(a) $5^x = 10$,

(2)

(b) $\log_3(x-2) = -1$.

(2)



Q3

(Total 4 marks)



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- $$x^2 + y^2 + 4x - 2y - 11 = 0$$

(a) the coordinates of the centre of C ,

(2)

- (b) the radius of C ,

(2)

- (c) the coordinates of the points where C crosses the y -axis, giving your answers as simplified surds.

(4)





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Q4

(Total 8 marks)



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5.

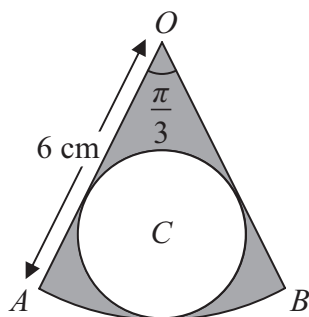


Figure 1

The shape shown in Figure 1 is a pattern for a pendant. It consists of a sector OAB of a circle centre O , of radius 6 cm, and angle $AOB = \frac{\pi}{3}$. The circle C , inside the sector, touches the two straight edges, OA and OB , and the arc AB as shown.

Find

- (a) the area of the sector OAB ,
- (2)**

- (b) the radius of the circle C .
- (3)**

The region outside the circle C and inside the sector OAB is shown shaded in Figure 1.

- (c) Find the area of the shaded region. (2)

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Q5

(Total 7 marks)



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- For this series, find

- (b) the first term, (2)

- (c) the sum to infinity,

- (d) the smallest value of n for which the sum of the first n terms of the series exceeds 1000.
- (4)**





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- $$3 \sin (x+45^{\circ})=2$$

(4)

- $$2\sin^2 x + 2 = 7\cos x$$

You must show clearly how you obtained your answers.

(6)





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P 3 8 1 5 8 A 0 2 3 3 2

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Figure 2

The volume of the cuboid is 81 cubic centimetres.

- (a) Show that the total length, L cm, of the twelve edges of the cuboid is given by

$$L = 12x + \frac{162}{x^2} \quad (3)$$

- (b) Use calculus to find the minimum value of L . (6)
- (c) Justify, by further differentiation, that the value of L that you have found is a minimum. (2)





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The graph shows a Cartesian coordinate system with the origin labeled O . A parabola, labeled $y = -x^2 + 2x + 24$, opens downwards. A straight line, labeled $y = x + 4$, has a positive slope. The region R is the area between the parabola and the line, bounded by their intersection points A and B . The region R is shaded gray.

Figure 3

(a) Use algebra to find the coordinates of the points A and B . (4)

(b) Use calculus to find the exact area of R . (7)





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(Total 11 marks)

Q9

TOTAL FOR PAPER: 75 MARKS

END

