

**Edexcel GCE**  
**Core Mathematics C2**  
**Silver Level S4**  
**(Question Paper)**

**All exam papers are issued free to students for education purpose only.  
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Paper Reference(s)

**6664/01**

**Edexcel GCE  
Core Mathematics C2  
Silver Level S4**

**Time: 1 hour 30 minutes**

**Materials required for examination papers**

Mathematical Formulae (Green)

**Items included with question**

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, differentiation and integration, or have retrievable mathematical formulas stored in them.**

**Instructions to Candidates**

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Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Core Mathematics C2), the paper reference (6664), your surname, initials and signature.

**Information for Candidates**

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A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

There are 11 questions in this question paper. The total mark for this paper is 75.

**Advice to Candidates**

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You must ensure that your answers to parts of questions are clearly labelled.

You must show sufficient working to make your methods clear to the Examiner. Answers without working may gain no credit.

**Suggested grade boundaries for this paper:**

A*	A	B	C	D	E
70	63	55	47	39	32

1.

$$y = 3^x + 2x.$$

(a) Complete the table below, giving the values of  $y$  to 2 decimal places.

$x$	0	0.2	0.4	0.6	0.8	1
$y$	1	1.65				5

(2)

(b) Use the trapezium rule, with all the values of  $y$  from your table, to find an approximate value for  $\int_0^1 (3^x + 2x) \, dx$ .

(4)

June 2010

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2.

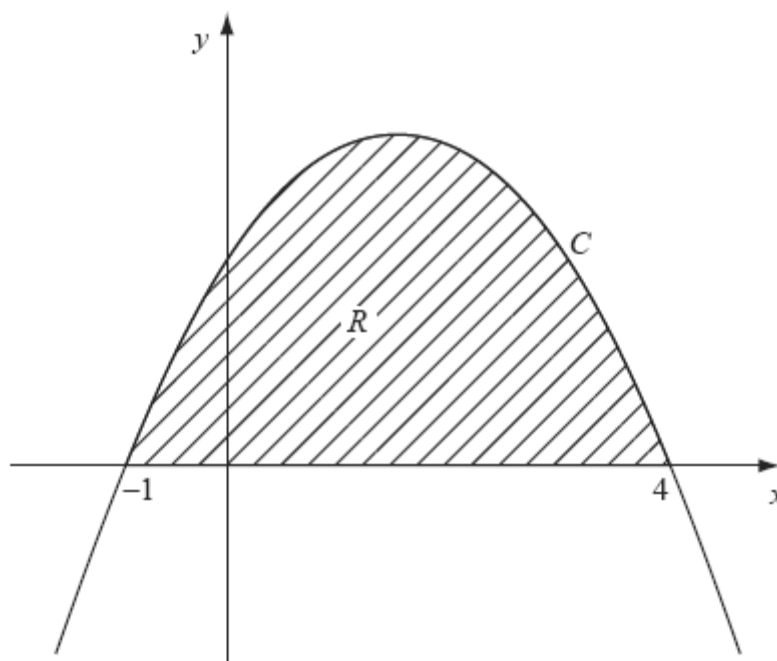


Figure 1

Figure 1 shows part of the curve  $C$  with equation  $y = (1 + x)(4 - x)$ .

The curve intersects the  $x$ -axis at  $x = -1$  and  $x = 4$ . The region  $R$ , shown shaded in Figure 1, is bounded by  $C$  and the  $x$ -axis.

Use calculus to find the exact area of  $R$ .

(5)

January 2009

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3. A company predicts a yearly profit of £120 000 in the year 2013. The company predicts that the yearly profit will rise each year by 5%. The predicted yearly profit forms a geometric sequence with common ratio 1.05.

(a) Show that the predicted profit in the year 2016 is £138 915. (1)

(b) Find the first year in which the yearly predicted profit exceeds £200 000. (5)

(c) Find the total predicted profit for the years 2013 to 2023 inclusive, giving your answer to the nearest pound. (3)

**January 2013**

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4. The circle  $C$  has equation

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

Find

(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)

**May 2011**

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5. The circle  $C$  has centre  $(3, 1)$  and passes through the point  $P(8, 3)$ .

(a) Find an equation for  $C$ . (4)

(b) Find an equation for the tangent to  $C$  at  $P$ , giving your answer in the form  $ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are integers. (5)

**June 2008**

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6. (a) Find, to 3 significant figures, the value of  $x$  for which  $8^x = 0.8$ . (2)

(b) Solve the equation

$$2 \log_3 x - \log_3 7x = 1. \quad (4)$$

May 2007

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7. (a) Given that

$$2 \log_3 (x - 5) - \log_3 (2x - 13) = 1,$$

show that  $x^2 - 16x + 64 = 0$ . (5)

- (b) Hence, or otherwise, solve  $2 \log_3 (x - 5) - \log_3 (2x - 13) = 1$ . (2)

June 2010

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8.

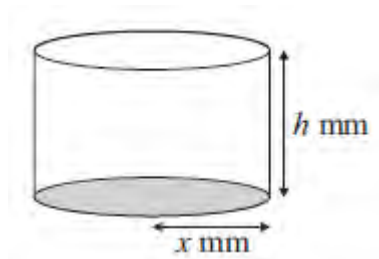


Figure 2

A manufacturer produces pain relieving tablets. Each tablet is in the shape of a solid circular cylinder with base radius  $x$  mm and height  $h$  mm, as shown in Figure 2.

Given that the volume of each tablet has to be  $60 \text{ mm}^3$ ,

- (a) express  $h$  in terms of  $x$ , (1)

(b) show that the surface area,  $A \text{ mm}^2$ , of a tablet is given by  $A = 2\pi x^2 + \frac{120}{x}$ . (3)

The manufacturer needs to minimise the surface area  $A \text{ mm}^2$ , of a tablet.

- (c) Use calculus to find the value of  $x$  for which  $A$  is a minimum. (5)

(d) Calculate the minimum value of  $A$ , giving your answer to the nearest integer. (2)

(e) Show that this value of  $A$  is a minimum. (2)

January 2012

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9. (i) Solve, for  $0 \leq \theta < 180^\circ$

$$\sin(2\theta - 30^\circ) + 1 = 0.4$$

giving your answers to 1 decimal place.

**(5)**

- (ii) Find all the values of  $x$ , in the interval  $0 \leq \theta < 360^\circ$ , for which

$$9 \cos^2 x - 11 \cos x + 3 \sin^2 x = 0$$

giving your answers to 1 decimal place.

**(7)**

You must show clearly how you obtained your answers.

**May 2013 (R)**

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**TOTAL FOR PAPER: 75 MARKS**

**END**