

**Edexcel GCE
Core Mathematics C2
Gold Level G4
(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

Gold Level G4

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

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

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

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
57	50	42	34	27	20

1. Using calculus, find the coordinates of the stationary point on the curve with equation

$$y = 2x + 3 + \frac{8}{x^2}, \quad x > 0$$

(6)

May 2013 (R)

2. Find the values of x such that

$$2 \log_3 x - \log_3(x - 2) = 2$$

(5)

May 2012

3. $f(x) = (3x - 2)(x - k) - 8$

where k is a constant.

- (a) Write down the value of $f(k)$.

(1)

When $f(x)$ is divided by $(x - 2)$ the remainder is 4.

- (b) Find the value of k .

(2)

- (c) Factorise $f(x)$ completely.

(3)

June 2009

4. Given that $y = 3x^2$,

(a) show that $\log_3 y = 1 + 2 \log_3 x$.

(3)

(b) Hence, or otherwise, solve the equation

$$1 + 2 \log_3 x = \log_3 (28x - 9).$$

(3)

January 2012

5.

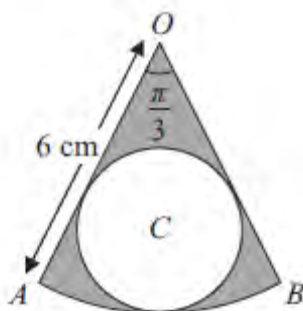


Figure 1

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)

May 2011

6. (a) Show that the equation

$$\tan 2x = 5 \sin 2x$$

can be written in the form

$$(1 - 5 \cos 2x) \sin 2x = 0. \quad (2)$$

- (b) Hence solve, for $0 \leq x \leq 180^\circ$,

$$\tan 2x = 5 \sin 2x,$$

giving your answers to 1 decimal place where appropriate.
You must show clearly how you obtained your answers.

(5)

May 2012

7. (i) Solve, for $-180^\circ \leq \theta < 180^\circ$,

$$(1 + \tan \theta)(5 \sin \theta - 2) = 0. \quad (4)$$

- (ii) Solve, for $0 \leq x < 360^\circ$,

$$4 \sin x = 3 \tan x. \quad (6)$$

June 2009

8.

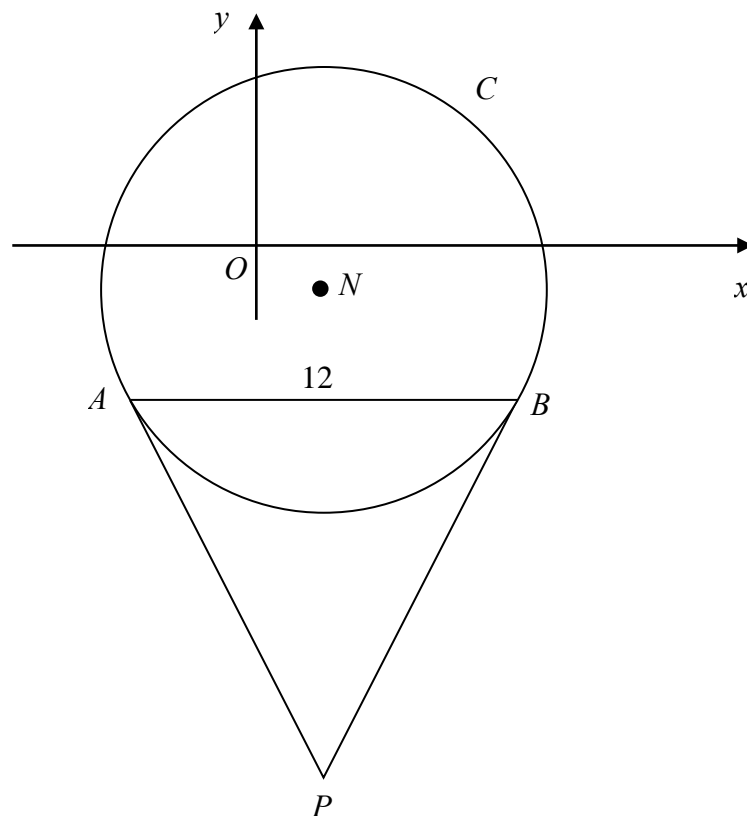


Figure 2

Figure 2 shows a sketch of the circle C with centre N and equation

$$(x - 2)^2 + (y + 1)^2 = \frac{169}{4}.$$

(a) Write down the coordinates of N . (2)

(b) Find the radius of C . (1)

The chord AB of C is parallel to the x -axis, lies below the x -axis and is of length 12 units as shown in Figure 2.

(c) Find the coordinates of A and the coordinates of B . (5)

(d) Show that angle $ANB = 134.8^\circ$, to the nearest 0.1 of a degree. (2)

The tangents to C at the points A and B meet at the point P .

(e) Find the length AP , giving your answer to 3 significant figures. (2)

January 2010

9. (i) Find the solutions of the equation $\sin(3x - 15^\circ) = \frac{1}{2}$, for which $0 \leq x \leq 180^\circ$.

(6)

(ii)

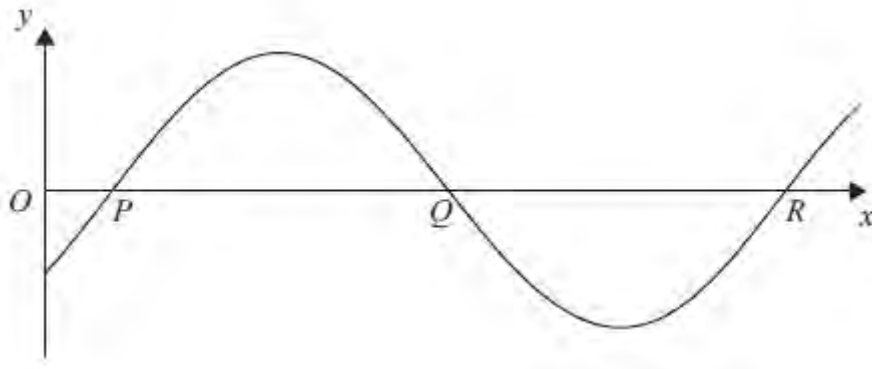


Figure 3

Figure 3 shows part of the curve with equation

$$y = \sin(ax - b), \text{ where } a > 0, \quad 0 < b < \pi.$$

The curve cuts the x -axis at the points P , Q and R as shown.

Given that the coordinates of P , Q and R are $\left(\frac{\pi}{10}, 0\right)$, $\left(\frac{3\pi}{5}, 0\right)$ and $\left(\frac{11\pi}{10}, 0\right)$ respectively, find the values of a and b .

(4)

January 2012

10.

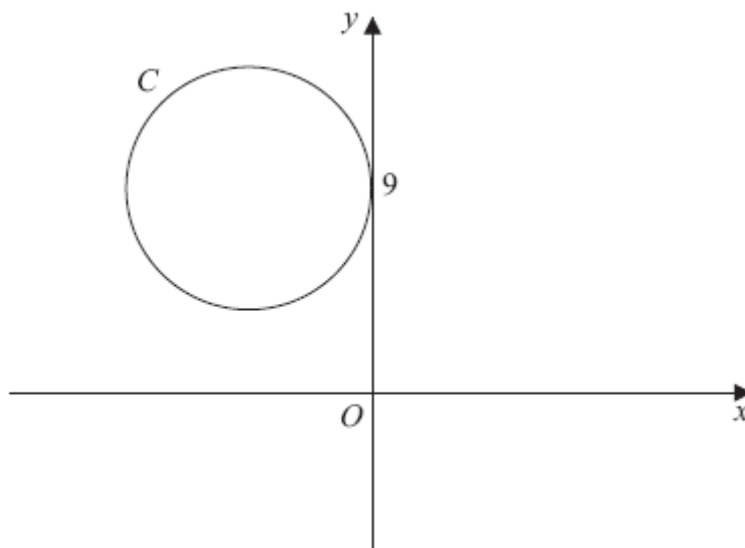


Figure 4

The circle C has radius 5 and touches the y -axis at the point $(0, 9)$, as shown in Figure 4.

(a) Write down an equation for the circle C , that is shown in Figure 4. (3)

A line through the point $P(8, -7)$ is a tangent to the circle C at the point T .

(b) Find the length of PT . (3)

May 2013

TOTAL FOR PAPER: 75 MARKS

END