

**Edexcel GCE
Core Mathematics C1
Gold Level G1
(Question Paper)**

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Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1

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 C1), the paper reference (6663), 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
60	52	43	34	25	16

1. (a) Find the value of $16^{-\frac{1}{4}}$. (2)

(b) Simplify $x\left(2x^{\frac{1}{4}}\right)^4$. (2)

January 2011

2. Given that $32\sqrt{2} = 2^a$, find the value of a . (3)

June 2009

3. Show that $\frac{2}{\sqrt{12}-\sqrt{8}}$ can be written in the form $\sqrt{a} + \sqrt{b}$, where a and b are integers. (5)

May 2012

4.
$$\frac{dy}{dx} = 5x^{-\frac{1}{2}} + x\sqrt{x}, \quad x > 0.$$

Given that $y = 35$ at $x = 4$, find y in terms of x , giving each term in its simplest form. (7)

January 2010

5.

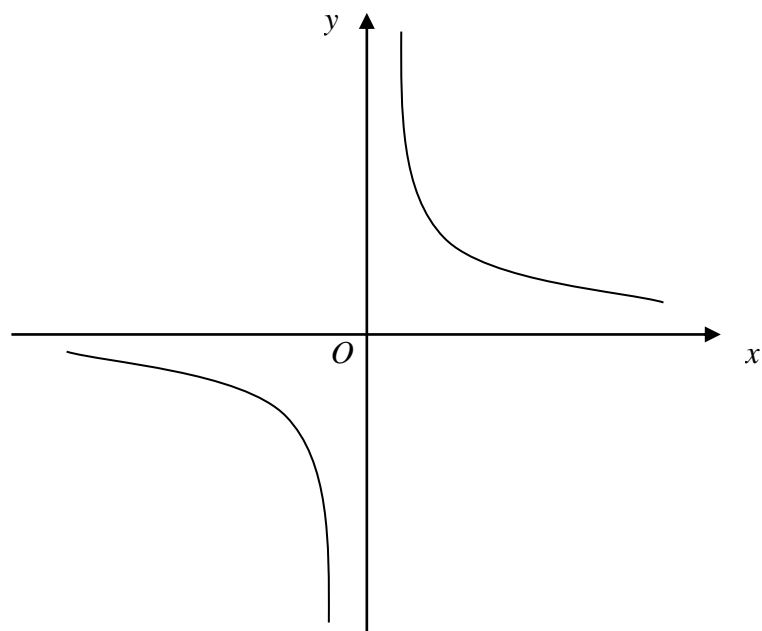


Figure 1

Figure 1 shows a sketch of the curve with equation $y = \frac{3}{x}$, $x \neq 0$.

(a) On a separate diagram, sketch the curve with equation $y = \frac{3}{x+2}$, $x \neq -2$, showing the coordinates of any point at which the curve crosses a coordinate axis. **(3)**

(b) Write down the equations of the asymptotes of the curve in part (a). **(2)**

May 2007

6. The equation $x^2 + 3px + p = 0$, where p is a non-zero constant, has equal roots.

Find the value of p .

(4)

June 2009

7. $f(x) = x^2 + (k + 3)x + k,$

where k is a real constant.

(a) Find the discriminant of $f(x)$ in terms of k . (2)

(b) Show that the discriminant of $f(x)$ can be expressed in the form $(k + a)^2 + b$, where a and b are integers to be found. (2)

(c) Show that, for all values of k , the equation $f(x) = 0$ has real roots. (2)

May 2011

8. $4x - 5 - x^2 = q - (x + p)^2,$

where p and q are integers.

(a) Find the value of p and the value of q . (3)

(b) Calculate the discriminant of $4x - 5 - x^2$. (2)

(c) Sketch the curve with equation $y = 4x - 5 - x^2$, showing clearly the coordinates of any points where the curve crosses the coordinate axes. (3)

May 2012

9. The first term of an arithmetic series is a and the common difference is d .

The 18th term of the series is 25 and the 21st term of the series is $32\frac{1}{2}$.

(a) Use this information to write down two equations for a and d . (2)

(b) Show that $a = -17.5$ and find the value of d . (2)

The sum of the first n terms of the series is 2750.

(c) Show that n is given by $n^2 - 15n = 55 \times 40$. (4)

(d) Hence find the value of n . (3)

January 2009

10.

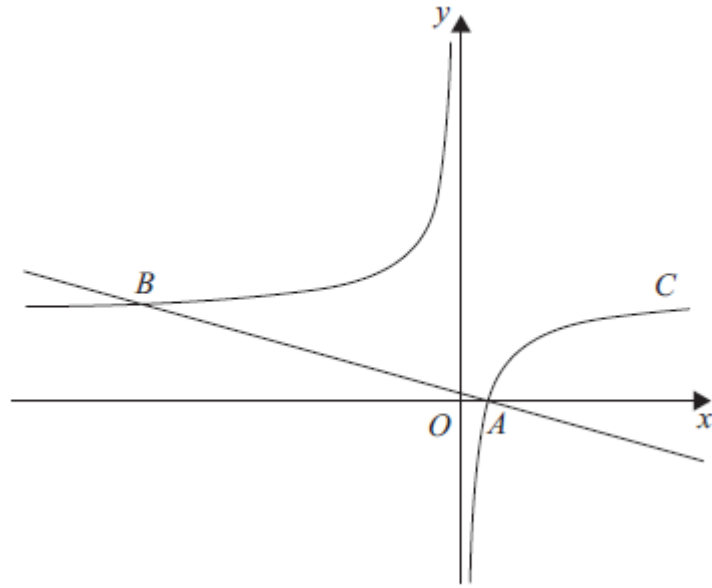


Figure 2

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

$$2x + 8y - 1 = 0.$$

(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)

January 2012

11. The curve C has equation

$$y = x^3 - 2x^2 - x + 9, \quad x > 0.$$

The point P has coordinates $(2, 7)$.

(a) Show that P lies on C .

(1)

(b) Find the equation of the tangent to C at P , giving your answer in the form $y = mx + c$, where m and c are constants.

(5)

The point Q also lies on C .

Given that the tangent to C at Q is perpendicular to the tangent to C at P ,

(c) show that the x -coordinate of Q is $\frac{1}{3}(2 + \sqrt{6})$.

(5)

June 2009

TOTAL FOR PAPER: 75 MARKS

END