

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

**All exam papers are issued free to students for education purpose only.
Mr.S.V.Swarnaraja (Marking Examiner, Team Leader & Author)
www.swanash.com, Mobile: +94777304755 , email: swa@swanash.com**

Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1

Gold Level G3

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 10 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
61	53	45	36	28	19

1. Factorise completely $x - 4x^3$.

(3)

January 2013

2. Express 8^{2x+3} in the form 2^y , stating y in terms of x .

(2)

January 2013

3. (a) Show that $x^2 + 6x + 11$ can be written as

$$(x + p)^2 + q,$$

where p and q are integers to be found.

(2)

- (b) Sketch the curve with equation $y = x^2 + 6x + 11$, showing clearly any intersections with the coordinate axes.

(2)

- (c) Find the value of the discriminant of $x^2 + 6x + 11$.

(2)

May 2010

4. The curve C has equation $y = x(5 - x)$ and the line L has equation $2y = 5x + 4$.

- (a) Use algebra to show that C and L do not intersect.

(4)

- (b) Sketch C and L on the same diagram, showing the coordinates of the points at which C and L meet the axes.

(4)

January 2012

5.

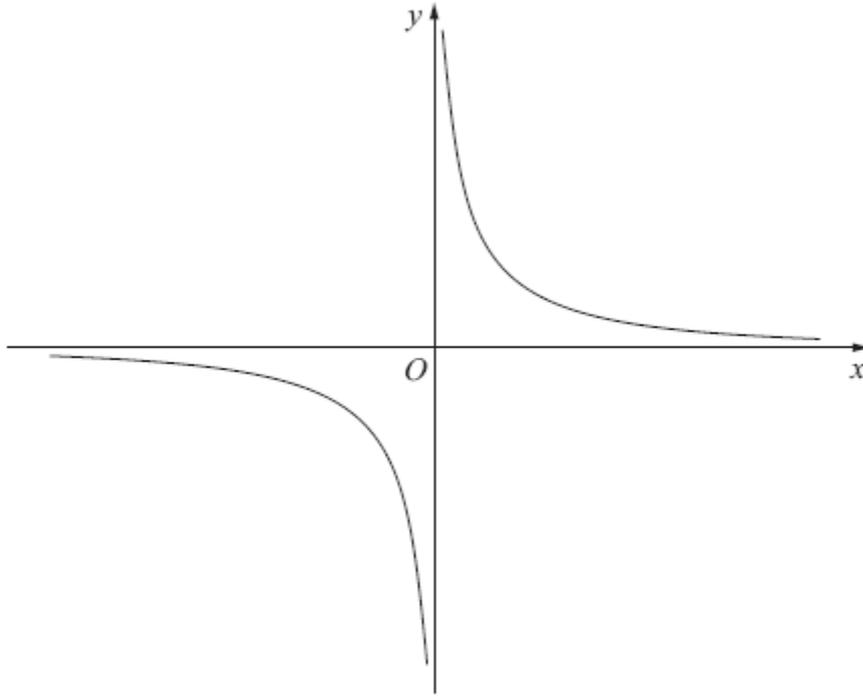


Figure 1

Figure 1 shows a sketch of the curve with equation $y = \frac{2}{x}$, $x \neq 0$.

The curve C has equation $y = \frac{2}{x} - 5$, $x \neq 0$, and the line l has equation $y = 4x + 2$.

(a) Sketch and clearly label the graphs of C and l on a single diagram.

On your diagram, show clearly the coordinates of the points where C and l cross the coordinate axes.

(5)

(b) Write down the equations of the asymptotes of the curve C .

(2)

(c) Find the coordinates of the points of intersection of $y = \frac{2}{x} - 5$ and $y = 4x + 2$.

(5)

January 2013

6. A company, which is making 200 mobile phones each week, plans to increase its production.

The number of mobile phones produced is to be increased by 20 each week from 200 in week 1 to 220 in week 2, to 240 in week 3 and so on, until it is producing 600 in week N .

- (a) Find the value of N .

(2)

The company then plans to continue to make 600 mobile phones each week.

- (b) Find the total number of mobile phones that will be made in the first 52 weeks starting from and including week 1.

(5)

May 2013

7. The equation

$$x^2 + kx + 8 = k$$

has no real solutions for x .

- (a) Show that k satisfies $k^2 + 4k - 32 < 0$.

(3)

- (b) Hence find the set of possible values of k .

(4)

January 2008

8. (a) Calculate the sum of all the even numbers from 2 to 100 inclusive,

$$2 + 4 + 6 + \dots + 100. \quad (3)$$

- (b) In the arithmetic series

$$k + 2k + 3k + \dots + 100,$$

k is a positive integer and k is a factor of 100.

- (i) Find, in terms of k , an expression for the number of terms in this series.

- (ii) Show that the sum of this series is

$$50 + \frac{5000}{k}. \quad (4)$$

- (c) Find, in terms of k , the 50th term of the arithmetic sequence

$$(2k + 1), (4k + 4), (6k + 7), \dots,$$

giving your answer in its simplest form.

(2)

May 2011

9. $f(x) = x^2 + 4kx + (3 + 11k)$, where k is a constant.

- (a) Express $f(x)$ in the form $(x + p)^2 + q$, where p and q are constants to be found in terms of k . (3)

Given that the equation $f(x) = 0$ has no real roots,

- (b) find the set of possible values of k . (4)

Given that $k = 1$,

- (c) sketch the graph of $y = f(x)$, showing the coordinates of any point at which the graph crosses a coordinate axis. (3)

January 2010

10.

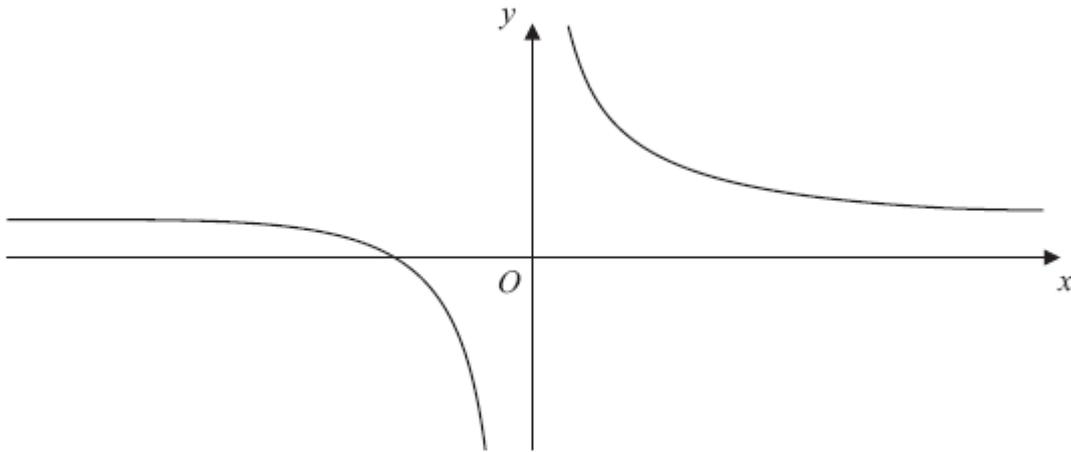


Figure 2

Figure 2 shows a sketch of the curve H with equation $y = \frac{3}{x} + 4$, $x \neq 0$.

(a) Give the coordinates of the point where H crosses the x -axis. (1)

(b) Give the equations of the asymptotes to H . (2)

(c) Find an equation for the normal to H at the point $P(-3, 3)$. (5)

This normal crosses the x -axis at A and the y -axis at B .

(d) Find the length of the line segment AB . Give your answer as a surd. (3)

May 2013

TOTAL FOR PAPER: 75 MARKS

END