

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

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

6663/01

Edexcel GCE

Core Mathematics C1

Gold Level G2

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 9 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
62	54	46	38	30	22

1. (a) Evaluate $(32)^{\frac{3}{5}}$, giving your answer as an integer. (2)

(b) Simplify fully $\left(\frac{25x^4}{4}\right)^{-\frac{1}{2}}$. (2)

May 2012

2. The points P and Q have coordinates $(-1, 6)$ and $(9, 0)$ respectively.

The line l is perpendicular to PQ and passes through the mid-point of PQ .

Find an equation for l , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers.

(5)

May 2011

3. A sequence a_1, a_2, a_3, \dots is defined by

$$a_1 = 2,$$

$$a_{n+1} = 3a_n - c$$

where c is a constant.

- (a) Find an expression for a_2 in terms of c .

(1)

Given that $\sum_{i=1}^3 a_i = 0$,

- (b) find the value of c .

(4)

January 2011

4.

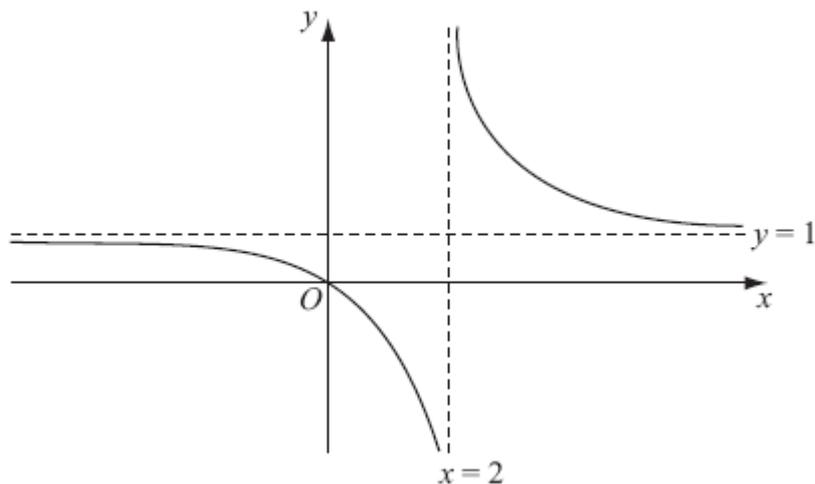


Figure 1

Figure 1 shows a sketch of the curve with equation $y = f(x)$ where

$$f(x) = \frac{x}{x-2}, \quad x \neq 2.$$

The curve passes through the origin and has two asymptotes, with equations $y = 1$ and $x = 2$, as shown in Figure 1.

(a) In the space below, sketch the curve with equation $y = f(x - 1)$ and state the equations of the asymptotes of this curve.

(3)

(b) Find the coordinates of the points where the curve with equation $y = f(x - 1)$ crosses the coordinate axes.

(4)

January 2011

5. The equation $x^2 + kx + (k + 3) = 0$, where k is a constant, has different real roots.

(a) Show that $k^2 - 4k - 12 > 0$.

(2)

(b) Find the set of possible values of k .

(4)

May 2007

6.
$$\frac{dy}{dx} = -x^3 + \frac{4x-5}{2x^3}, \quad x \neq 0.$$

Given that $y = 7$ at $x = 1$, find y in terms of x , giving each term in its simplest form.

(6)

January 2013

7. The line L_1 has equation $4y + 3 = 2x$.

The point $A(p, 4)$ lies on L_1 .

(a) Find the value of the constant p .

(1)

The line L_2 passes through the point $C(2, 4)$ and is perpendicular to L_1 .

(b) Find an equation for L_2 giving your answer in the form $ax + by + c = 0$, where a , b and c are integers.

(5)

The line L_1 and the line L_2 intersect at the point D .

(c) Find the coordinates of the point D .

(3)

(d) Show that the length of CD is $\frac{3}{2}\sqrt{5}$.

(3)

A point B lies on L_1 and the length of $AB = \sqrt{80}$.

The point E lies on L_2 such that the length of the line $CDE = 3$ times the length of CD .

(e) Find the area of the quadrilateral $ACBE$.

(3)

May 2012

8. (a) On the axes below sketch the graphs of

(i) $y = x(4 - x)$,

(ii) $y = x^2(7 - x)$,

showing clearly the coordinates of the points where the curves cross the coordinate axes.

(5)

(b) Show that the x -coordinates of the points of intersection of

$$y = x(4 - x) \quad \text{and} \quad y = x^2(7 - x)$$

are given by the solutions to the equation $x(x^2 - 8x + 4) = 0$.

(3)

The point A lies on both of the curves and the x and y coordinates of A are both positive.

(c) Find the exact coordinates of A , leaving your answer in the form $(p + q\sqrt{3}, r + s\sqrt{3})$, where p, q, r and s are integers.

(7)

May 2010

9. The curve C has equation

$$y = 2x - 8\sqrt{x} + 5, \quad x \geq 0.$$

(a) Find $\frac{dy}{dx}$, giving each term in its simplest form.

(3)

The point P on C has x -coordinate equal to $\frac{1}{4}$.

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

(4)

The tangent to C at the point Q is parallel to the line with equation $2x - 3y + 18 = 0$.

(c) Find the coordinates of Q .

(5)

January 2013

TOTAL FOR PAPER: 75 MARKS

END