

**Edexcel GCE
Core Mathematics C1
Bronze Level B1
(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

Bronze Level B1

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 |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 74 | 66 | 58 | 50 | 42 | 34 |

1. Find $\int (3x^2 + 4x^5 - 7) \, dx$.

(4)

January 2008

2. Find $\int (12x^5 - 8x^3 + 3) \, dx$, giving each term in its simplest form.

(4)

January 2009

3. Expand and simplify $(\sqrt{7} + 2)(\sqrt{7} - 2)$.

(2)

January 2009

4.
$$y = 5x^3 - 6x^{\frac{4}{3}} + 2x - 3.$$

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

(4)

(b) Find $\frac{d^2y}{dx^2}$.

(2)

May 2012

5. Find the set of values of x for which

(a) $2(3x + 4) > 1 - x$,

(2)

(b) $3x^2 + 8x - 3 < 0$.

(4)

May 2013

6.

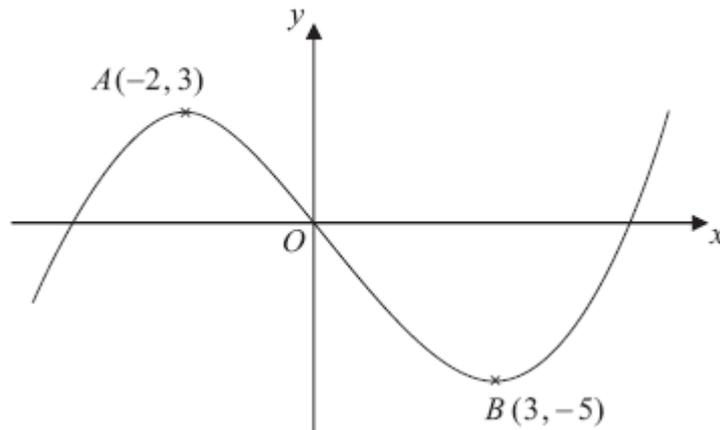


Figure 1

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve has a maximum point A at $(-2, 3)$ and a minimum point B at $(3, -5)$.

On separate diagrams sketch the curve with equation

(a) $y = f(x + 3)$, **(3)**

(b) $y = 2f(x)$. **(3)**

On each diagram show clearly the coordinates of the maximum and minimum points.

The graph of $y = f(x) + a$ has a minimum at $(3, 0)$, where a is a constant.

(c) Write down the value of a . **(1)**

May 2010

7. Jill gave money to a charity over a 20-year period, from Year 1 to Year 20 inclusive. She gave £150 in Year 1, £160 in Year 2, £170 in Year 3, and so on, so that the amounts of money she gave each year formed an arithmetic sequence.

(a) Find the amount of money she gave in Year 10.

(2)

(b) Calculate the total amount of money she gave over the 20-year period.

(3)

Kevin also gave money to charity over the same 20-year period.

He gave £ A in Year 1 and the amounts of money he gave each year increased, forming an arithmetic sequence with common difference £30.

The total amount of money that Kevin gave over the 20-year period was **twice** the total amount of money that Jill gave.

(c) Calculate the value of A .

(4)

January 2010

8.

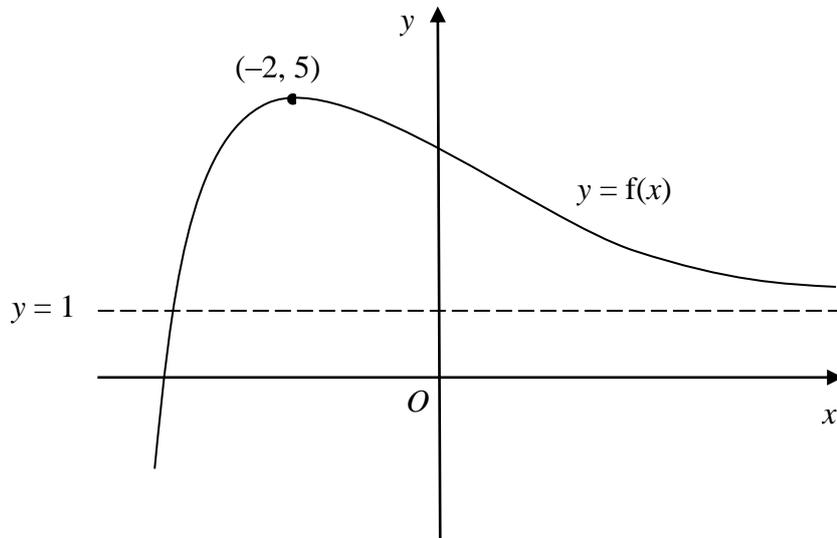


Figure 2

Figure 2 shows a sketch of part of the curve with equation $y = f(x)$.

The curve has a maximum point $(-2, 5)$ and an asymptote $y = 1$, as shown in Figure 2.

On separate diagrams, sketch the curve with equation

(a) $y = f(x) + 2$, (2)

(b) $y = 4f(x)$, (2)

(c) $y = f(x + 1)$. (3)

On each diagram, show clearly the coordinates of the maximum point and the equation of the asymptote.

January 2010

9.

$$f'(x) = \frac{(3-x^2)^2}{x^2}, \quad x \neq 0.$$

(a) Show that $f'(x) = 9x^{-2} + A + Bx^2$, where A and B are constants to be found. (3)

(b) Find $f''(x)$. (2)

Given that the point $(-3, 10)$ lies on the curve with equation $y = f(x)$,

(c) find $f(x)$. (5)

May 2013

10.

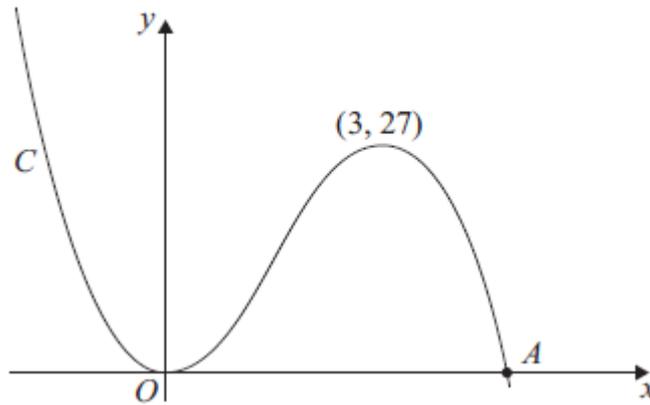


Figure 3

Figure 3 shows a sketch of the curve C with equation $y = f(x)$, where

$$f(x) = x^2(9 - 2x).$$

There is a minimum at the origin, a maximum at the point $(3, 27)$ and C cuts the x -axis at the point A .

(a) Write down the coordinates of the point A . (1)

(b) On separate diagrams sketch the curve with equation

(i) $y = f(x + 3)$,

(ii) $y = f(3x)$.

On each sketch you should indicate clearly the coordinates of the maximum point and any points where the curves cross or meet the coordinate axes. (6)

The curve with equation $y = f(x) + k$, where k is a constant, has a maximum point at $(3, 10)$.

(c) Write down the value of k . (1)

May 2012

11. The curve C has equation

$$y = \frac{1}{2}x^3 - 9x^{\frac{3}{2}} + \frac{8}{x} + 30, \quad x > 0.$$

- (a) Find $\frac{dy}{dx}$. (4)
- (b) Show that the point $P(4, -8)$ lies on C . (2)
- (c) Find an equation of the normal to C at the point P , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers. (6)

January 2011

TOTAL FOR PAPER: 75 MARKS

END