

**Edexcel GCE
Core Mathematics C3
Bronze Level B1
(Question Paper)**

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Paper Reference(s)

6665/01

**Edexcel GCE
Core Mathematics C3
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 C3), the paper reference (6665), 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
72	66	60	54	49	43

1. Express

$$\frac{3x+5}{x^2+x-12} - \frac{2}{x-3}$$

as a single fraction in its simplest form.

(4)

June 2013 (R)

2.

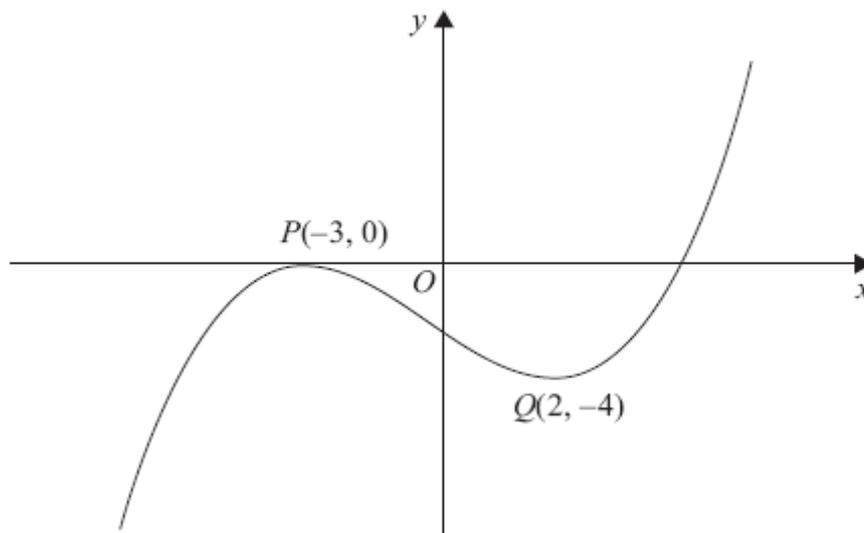


Figure 1

Figure 1 shows the graph of equation $y = f(x)$.

The points $P(-3, 0)$ and $Q(2, -4)$ are stationary points on the graph.

Sketch, on separate diagrams, the graphs of

(a) $y = 3f(x + 2)$,

(3)

(b) $y = |f(x)|$.

(3)

On each diagram, show the coordinates of any stationary points.

January 2012

3. Rabbits were introduced onto an island. The number of rabbits, P , t years after they were introduced is modelled by the equation

$$P = 80e^{\frac{1}{5}t}, \quad t \in \mathbb{R}, \quad t \geq 0.$$

(a) Write down the number of rabbits that were introduced to the island. (1)

(b) Find the number of years it would take for the number of rabbits to first exceed 1000. (2)

(c) Find $\frac{dP}{dt}$. (2)

(d) Find P when $\frac{dP}{dt} = 50$. (3)

June 2009

4.

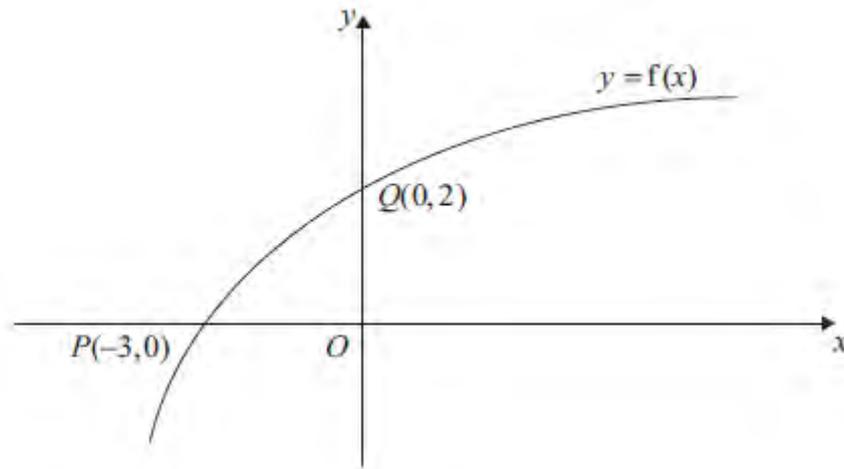


Figure 2

Figure 2 shows part of the curve with equation $y = f(x)$, $x \in \mathbb{R}$.

The curve passes through the points $Q(0, 2)$ and $P(-3, 0)$ as shown.

(a) Find the value of $ff(-3)$.

(2)

On separate diagrams, sketch the curve with equation

(b) $y = f^{-1}(x)$,

(2)

(c) $y = f(|x|) - 2$,

(2)

(d) $y = 2f\left(\frac{1}{2}x\right)$.

(3)

Indicate clearly on each sketch the coordinates of the points at which the curve crosses or meets the axes.

January 2013

5.

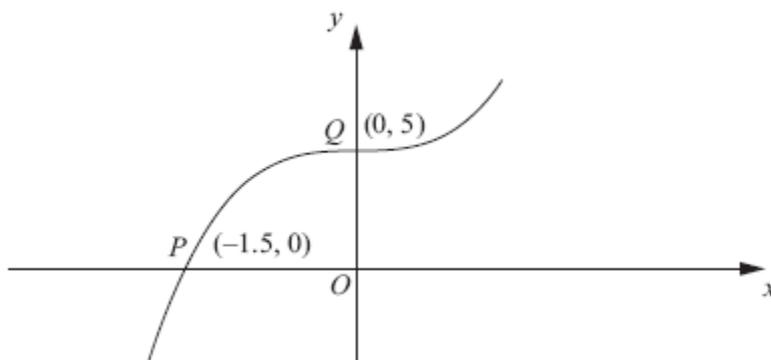


Figure 3

Figure 3 shows part of the curve with equation $y = f(x)$.
The curve passes through the points $P(-1.5, 0)$ and $Q(0, 5)$ as shown.

On separate diagrams, sketch the curve with equation

(a) $y = |f(x)|$ (2)

(b) $y = f(|x|)$ (2)

(c) $y = 2f(3x)$ (3)

Indicate clearly on each sketch the coordinates of the points at which the curve crosses or meets the axes.

June 2012

6.

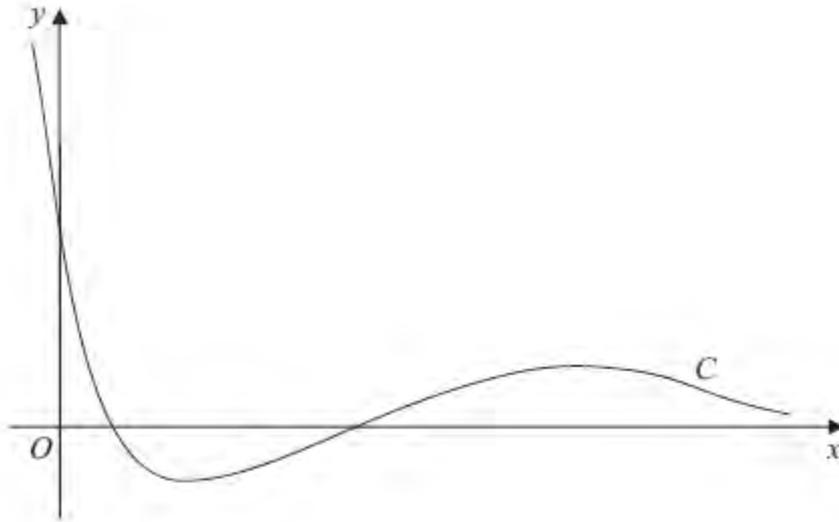


Figure 4

Figure 4 shows a sketch of the curve C with the equation $y = (2x^2 - 5x + 2)e^{-x}$.

- (a) Find the coordinates of the point where C crosses the y -axis. (1)
- (b) Show that C crosses the x -axis at $x = 2$ and find the x -coordinate of the other point where C crosses the x -axis. (3)
- (c) Find $\frac{dy}{dx}$. (3)
- (d) Hence find the exact coordinates of the turning points of C . (5)

June 2010

7.

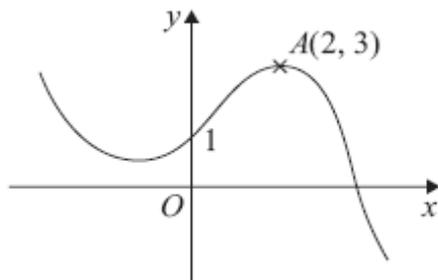


Figure 5

Figure 5 shows a sketch of the graph of $y = f(x)$.

The graph intersects the y -axis at the point $(0, 1)$ and the point $A(2, 3)$ is the maximum turning point.

Sketch, on separate axes, the graphs of

(i) $y = f(-x) + 1$,

(ii) $y = f(x + 2) + 3$,

(iii) $y = 2f(2x)$.

On each sketch, show the coordinates of the point at which your graph intersects the y -axis and the coordinates of the point to which A is transformed.

(9)

January 2010

8.

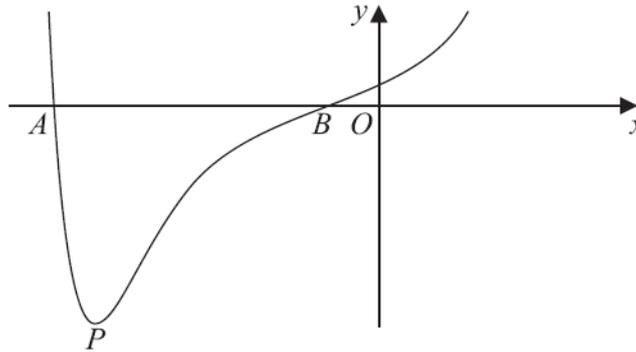


Figure 6

Figure 6 shows a sketch of part of the curve with equation $y = f(x)$ where

$$f(x) = (x^2 + 3x + 1)e^{x^2}$$

The curve cuts the x -axis at points A and B as shown in Figure 6.

(a) Calculate the x -coordinate of A and the x -coordinate of B , giving your answers to 3 decimal places. (2)

(b) Find $f'(x)$. (3)

The curve has a minimum turning point P as shown in Figure 6.

(c) Show that the x -coordinate of P is the solution of

$$x = -\frac{3(2x^2 + 1)}{2(x^2 + 2)} \quad (3)$$

(d) Use the iteration formula

$$x_{n+1} = -\frac{3(2x_n^2 + 1)}{2(x_n^2 + 2)}, \quad \text{with } x_0 = -2.4,$$

to calculate the values of x_1 , x_2 and x_3 , giving your answers to 3 decimal places. (3)

The x -coordinate of P is α .

(e) By choosing a suitable interval, prove that $\alpha = -2.43$ to 2 decimal places. (2)

June 2013 (R)

9. (a) Simplify fully

$$\frac{2x^2 + 9x - 5}{x^2 + 2x - 15}$$

(3)

Given that

$$\ln(2x^2 + 9x - 5) = 1 + \ln(x^2 + 2x - 15), \quad x \neq -5,$$

(b) find x in terms of e .

(4)

June 2010

TOTAL FOR PAPER: 75 MARKS

END