

**Edexcel GCE
Core Mathematics C1
Bronze Level B4
(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 B4**

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
71	63	55	47	39	31

1. Simplify $(3 + \sqrt{5})(3 - \sqrt{5})$. (2)
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- May 2007**

2. (a) Expand and simplify $(7 + \sqrt{5})(3 - \sqrt{5})$. (3)
- (b) Express $\frac{7 + \sqrt{5}}{3 + \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers. (3)
-
- January 2010**

3. Given that $y = 2x^3 + \frac{3}{x^2}$, $x \neq 0$, find
- (a) $\frac{dy}{dx}$, (3)
- (b) $\int y \, dx$, simplifying each term. (3)
-
- June 2009**

4. A sequence x_1, x_2, x_3, \dots is defined by
- $$x_1 = 1,$$
- $$x_{n+1} = ax_n + 5, \quad n \geq 1,$$
- where a is a constant.
- (a) Write down an expression for x_2 in terms of a . (1)
- (b) Show that $x_3 = a^2 + 5a + 5$. (2)
- Given that $x_3 = 41$
- (c) find the possible values of a . (3)
-
- January 2012**

5. (a) Write $\frac{2\sqrt{x+3}}{x}$ in the form $2x^p + 3x^q$, where p and q are constants.

(2)

Given that $y = 5x - 7 + \frac{2\sqrt{x+3}}{x}$, $x > 0$,

- (b) find $\frac{dy}{dx}$, simplifying the coefficient of each term.

(4)

January 2008

6. Given that $\frac{2x^2 - x^{\frac{3}{2}}}{\sqrt{x}}$ can be written in the form $2x^p - x^q$,

- (a) write down the value of p and the value of q .

(2)

Given that $y = 5x^4 - 3 + \frac{2x^2 - x^{\frac{3}{2}}}{\sqrt{x}}$,

- (b) find $\frac{dy}{dx}$, simplifying the coefficient of each term.

(4)

January 2009

7. The curve with equation $y = f(x)$ passes through the point $(-1, 0)$.

Given that

$$f'(x) = 12x^2 - 8x + 1,$$

find $f(x)$.

(5)

January 2011

8. The equation $x^2 + (k-3)x + (3-2k) = 0$, where k is a constant, has two distinct real roots.

- (a) Show that k satisfies

$$k^2 + 2k - 3 > 0.$$

(3)

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

(4)

January 2011

9. (a) Factorise completely $x^3 - 4x$. (3)

- (b) Sketch the curve C with equation

$$y = x^3 - 4x,$$

showing the coordinates of the points at which the curve meets the axis.

(3)

The point A with x -coordinate -1 and the point B with x -coordinate 3 lie on the curve C .

- (c) Find an equation of the line which passes through A and B , giving your answer in the form $y = mx + c$, where m and c are constants.

(5)

- (d) Show that the length of AB is $k\sqrt{10}$, where k is a constant to be found.

(2)

January 2010

10. (a) Factorise completely $x^3 - 6x^2 + 9x$ (3)

- (b) Sketch the curve with equation

$$y = x^3 - 6x^2 + 9x$$

showing the coordinates of the points at which the curve meets the x -axis.

(4)

Using your answer to part (b), or otherwise,

- (c) sketch, on a separate diagram, the curve with equation

$$y = (x - 2)^3 - 6(x - 2)^2 + 9(x - 2)$$

showing the coordinates of the points at which the curve meets the x -axis.

(2)

June 2009

11. The curve C has equation $y = f(x)$, $x > 0$, where

$$\frac{dy}{dx} = 3x - \frac{5}{\sqrt{x}} - 2.$$

Given that the point $P(4, 5)$ lies on C , find

(a) $f(x)$,

(5)

(b) an equation of the tangent to C at the point P , giving your answer in the form $ax + by + c = 0$, where a , b and c are integers.

(4)

May 2010

TOTAL FOR PAPER: 75 MARKS

END