Edexcel GCE
Core Mathematics C1
Bronze Level B2
(Question Paper)

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Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1

Bronze Level B2

Time: 1 hour 30 minutes

Materials required for examination papers	**Items included with question**
Mathematical Formulae (Green)	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
73	65	57	49	41	33

1. Given that $y = x^4 + 6x^{\frac{1}{2}}$, find in their simplest form

(*a*) $\frac{dy}{dx}$,

(3)

(*b*) $\int y \ dx$.

(3)

January 2012

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2. Find

$$\int (12x^5 - 3x^2 + 4x^{\frac{1}{3}}) \ dx,$$

giving each term in its simplest form.

(5)

January 2011

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3. Given that $y = 3x^2 + 4\sqrt{x}, \quad x > 0$, find

(*a*) $\frac{dy}{dx}$,

(2)

(*b*) $\frac{d^2y}{dx^2}$,

(2)

(*c*) $\int y \ dx$.

(3)

May 2007

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4. $f(x) = 3x + x^3, \qquad x > 0.$

(*a*) Differentiate to find $f'(x)$.

(2)

Given that $f'(x) = 15$,

(*b*) find the value of x.

(3)

June 2008

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5. A sequence $x_1, x_2, x_3, \ldots$ is defined by

$$x_1 = 1,$$

$$x_{n+1} = ax_n - 3, \quad n \geq 1,$$

where a is a constant.

(a) Find an expression for x_2 in terms of a.

(1)

(b) Show that $x_3 = a^2 - 3a - 3$.

(2)

Given that $x_3 = 7$,

(c) find the possible values of a.

(3)

June 2008

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6. A boy saves some money over a period of 60 weeks. He saves 10p in week 1, 15p in week 2, 20p in week 3 and so on until week 60. His weekly savings form an arithmetic sequence.

(a) Find how much he saves in week 15.

(2)

(b) Calculate the total amount he saves over the 60 week period.

(3)

The boy's sister also saves some money each week over a period of m weeks. She saves 10p in week 1, 20p in week 2, 30p in week 3 and so on so that her weekly savings form an arithmetic sequence. She saves a total of £63 in the m weeks.

(c) Show that

$$m(m + 1) = 35 \times 36.$$

(4)

(d) Hence write down the value of m.

(1)

May 2012

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7. Given that

$$y = 8x^3 - 4\sqrt{x} + \frac{3x^2 + 2}{x}, \qquad x > 0,$$

find $\frac{dy}{dx}$.

(6)

May 2010

8.

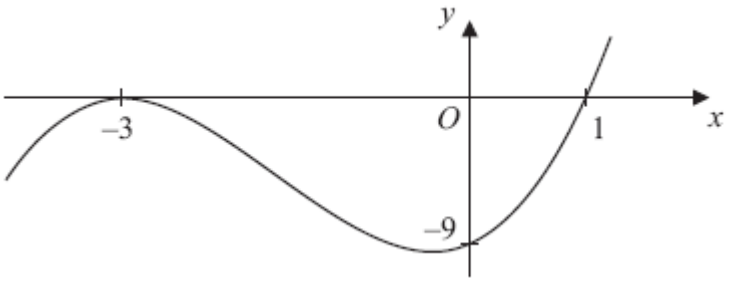

Figure 1

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

$$f(x) = (x + 3)^2 (x – 1), \qquad x \in \mathbb{R}.$$

The curve crosses the x-axis at (1, 0), touches it at (–3, 0) and crosses the y-axis at (0, –9).

(*a*) Sketch the curve C with equation $y = f(x + 2)$ and state the coordinates of the points where the curve C meets the x-axis.

(3)

(*b*) Write down an equation of the curve C.

(1)

(*c*) Use your answer to part (*b*) to find the coordinates of the point where the curve C meets the y-axis.

(2)

May 2013

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9. The line L_1 has equation $2y - 3x - k = 0$, where k is a constant.

Given that the point $A(1, 4)$ lies on L_1, find

(a) the value of k,

(1)

(b) the gradient of L_1.

(2)

The line L_2 passes through A and is perpendicular to L_1.

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

(4)

The line L_2 crosses the x-axis at the point B.

(d) Find the coordinates of B.

(2)

(e) Find the exact length of AB.

(2)

January 2011

10.

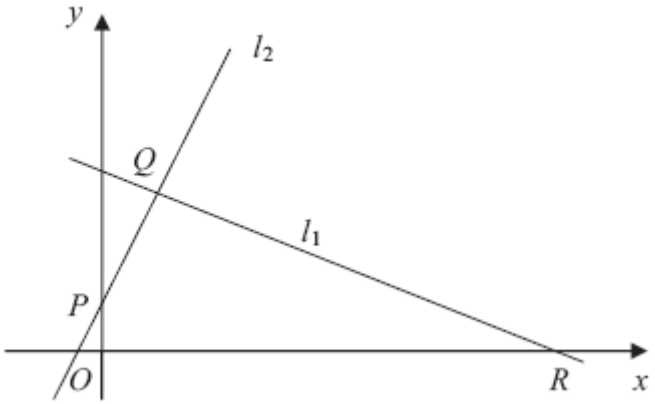

Figure 2

The points Q (1, 3) and R (7, 0) lie on the line l_1, as shown in Figure 2.

The length of QR is $a\sqrt{5}$.

(a) Find the value of a.

(3)

The line l_2 is perpendicular to l_1, passes through Q and crosses the y-axis at the point P, as shown in Figure 2. Find

(b) an equation for l_2,

(5)

(c) the coordinates of P,

(1)

(d) the area of ΔPQR.

(4)

June 2008

TOTAL FOR PAPER: 75 MARKS

END