Edexcel GCE
Core Mathematics C1
Silver Level S2
(Question Paper)

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Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1
Silver Level S2

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 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	62	53	44	36	28

1. Simplify

(*a*) $(3\sqrt{7})^2$

(1)

(*b*) $(8 + \sqrt{5})(2 - \sqrt{5})$

(3)

June 2009

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2. Find

$$\int \left(10x^4 - 4x - \frac{3}{\sqrt{x}}\right) \mathrm{d}x,$$

giving each term in its simplest form.

(4)

May 2013

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3. Find the set of values of x for which

(*a*) $4x - 5 > 15 - x$,

(2)

(*b*) $x(x - 4) > 12$.

(4)

January 2012

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4. A sequence u_1, u_2, u_3, ..., satisfies

$$u_{n+1} = 2u_n - 1, \quad n \geq 1.$$

Given that $u_2 = 9$,

(*a*) find the value of u_3 and the value of u_4,

(2)

(*b*) evaluate $\sum_{r=1}^{4} u_r$.

(3)

January 2013

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5. A sequence $a_1, a_2, a_3, \ldots$, is defined by

$$a_1 = k,$$

$$a_{n+1} = 5a_n + 3, \quad n \geq 1,$$

where k is a positive integer.

(*a*) Write down an expression for a_2 in terms of k.

(1)

(*b*) Show that $a_3 = 25k + 18$.

(2)

(*c*) (i) Find $\sum_{r=1}^{4} a_r$ in terms of k, in its simplest form.

(ii) Show that $\sum_{r=1}^{4} a_r$ is divisible by 6.

(4)

May 2011

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6. The curve C has equation $y = \frac{3}{x}$ and the line l has equation $y = 2x + 5$.

(*a*) Sketch the graphs of C and l, indicating clearly the coordinates of any intersections with the axes.

(3)

(*b*) Find the coordinates of the points of intersection of C and l.

(6)

June 2008

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7. A curve with equation $y = f(x)$ passes through the point (2, 10). Given that

$$f'(x) = 3x^2 - 3x + 5,$$

find the value of f(1).

(5)

January 2012

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8. (*a*) Find an equation of the line joining $A(7, 4)$ and $B(2, 0)$, giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.

(3)

(*b*) Find the length of AB, leaving your answer in surd form.

(2)

The point C has coordinates $(2, t)$, where $t > 0$, and $AC = AB$.

(*c*) Find the value of t.

(1)

(*d*) Find the area of triangle ABC.

(2)

May 2010

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9. The curve C has equation $y = f(x)$, $x > 0$, and $f'(x) = 4x - 6\sqrt{x} + \frac{8}{x^2}$.

Given that the point $P(4, 1)$ lies on C,

(*a*) find $f(x)$ and simplify your answer.

(6)

(*b*) Find an equation of the normal to C at the point $P(4, 1)$.

(4)

January 2008

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10. (*a*) Sketch the graphs of

(i) $y = x(x + 2)(3 - x)$,

(ii) $y = -\frac{2}{x}$.

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

(6)

(*b*) Using your sketch state, giving a reason, the number of real solutions to the equation

$$x(x + 2)(3 - x) + \frac{2}{x} = 0.$$

(2)

January 2011

11.

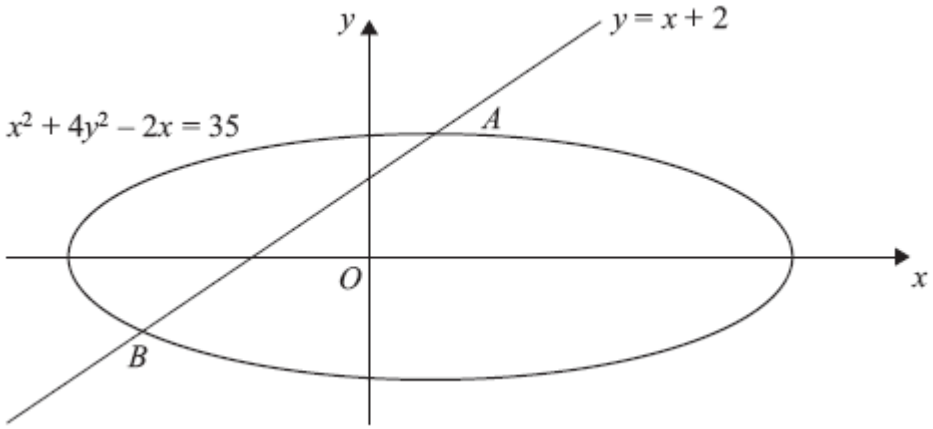

Figure 1

The line $y = x + 2$ meets the curve $x^2 + 4y^2 – 2x = 35$ at the points A and B as shown in Figure 1.

(*a*) Find the coordinates of A and the coordinates of B.

(6)

(*b*) Find the distance AB in the form $r\sqrt{2}$, where r is a rational number.

(3)

May 2013 (R)

TOTAL FOR PAPER: 75 MARKS

END