Paper Reference (complete below)								

Centre No.					
Candidate No.					

Surname	Initial(s)
Signature	

Paper Reference(s)

6663

Edexcel GCE

Pure Mathematics C1

Advanced Subsidiary

Specimen Paper

Time: 1 hour 30 minutes

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
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8	
9	
10	
Total	

Materials required for examination
Answer Book (AB16)
Mathematical Formulae (Lilac)
Graph Paper (ASG2)

Items included with question papers
Nil

Calculators may NOT be used in this examination.

Instructions to Candidates

Tour candidate details are printed next to the bar code above. Check that these are correct and sign your name in the signature box above.
If your candidate details are incorrect, or missing, then complete ALL the boxes above.
When a calculator is used, the answer should be given to an appropriate degree of accuracy.
You must write your answer for each question in the space following the question.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

A booklet 'mathematical Formulae and Statistical Tables' is provided.
Full marks may be obtained for answers to ALL questions.
This paper has 10 questions.

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.

Turn over

Edexcel
Success through qualifications

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1. Calculate $\sum_{r=1}^{20}(5+2r)$.

(3)

Leave blank

2. Find $\int (5x + 3\sqrt{x})\, dx$.

(4)

Leave blank

3. (a) Express $\sqrt{80}$ in the form $a\sqrt{5}$, where a is an integer.

(1)

(b) Express $(4 - \sqrt{5})^2$ in the form $b + c\sqrt{5}$, where b and c are integers.

(3)

Leave blank

4. The points A and B have coordinates (3, 4) and (7, –6) respectively. The straight line l passes through A and is perpendicular to AB.

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

(5)

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5. **Figure 1**

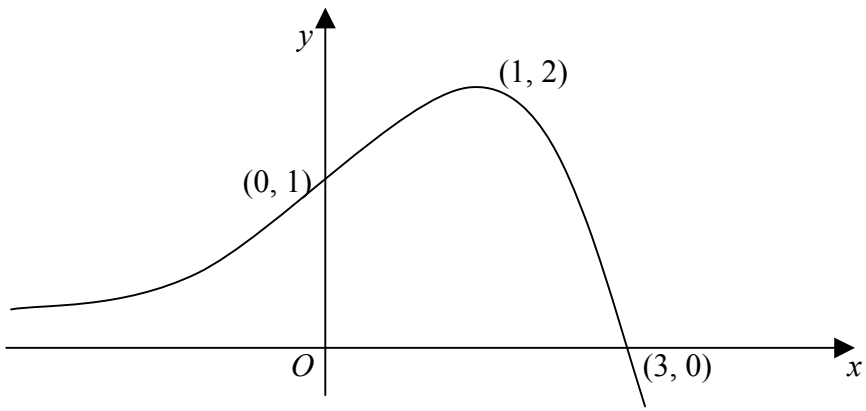

Figure 1 shows a sketch of the curve with equation $y = \mathrm{f}(x)$.

The curve crosses the coordinate axes at the points (0, 1) and (3, 0). The maximum point on the curve is (1, 2).

On separate diagrams in the space opposite, sketch the curve with equation

(a) $y = \mathrm{f}(x + 1)$,

(3)

(b) $y = \mathrm{f}(2x)$.

(3)

On each diagram, show clearly the coordinates of the maximum point, and of each point at which the curve crosses the coordinate axes.

Leave blank

6. (a) Solve the simultaneous equations

$$y + 2x = 5,$$

$$2x^2 - 3x - y = 16.$$

(6)

(b) Hence, or otherwise, find the set of values of x for which

$$2x^2 - 3x - 16 > 5 - 2x.$$

(3)

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7. Ahmed plans to save £250 in the year 2001, £300 in 2002, £350 in 2003, and so on until the year 2020. His planned savings form an arithmetic sequence with common difference £50.

(a) Find the amount he plans to save in the year 2011.

(2)

(b) Calculate his total planned savings over the 20 year period from 2001 to 2020.

(3)

Ben also plans to save money over the same 20 year period. He saves £A in the year 2001 and his planned yearly savings form an arithmetic sequence with common difference £60.

Given that Ben's total planned savings over the 20 year period are equal to Ahmed's total planned savings over the same period,

(c) calculate the value of A.

(4)

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8. Given that

$$x^2 + 10x + 36 \equiv (x + a)^2 + b,$$

where a and b are constants,

(a) find the value of a and the value of b.

(3)

(b) Hence show that the equation $x^2 + 10x + 36 = 0$ has no real roots.

(2)

The equation $x^2 + 10x + k = 0$ has equal roots.

(c) Find the value of k.

(2)

(d) For this value of k, sketch the graph of $y = x^2 + 10x + k$, showing the coordinates of any points at which the graph meets the coordinate axes.

(4)

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9. The curve C has equation $y = \mathrm{f}(x)$ and the point $P(3, 5)$ lies on C.

Given that

$$\mathrm{f}'(x) = 3x^2 - 8x + 6,$$

(a) find $\mathrm{f}(x)$.

(4)

(b) Verify that the point (2, 0) lies on C.

(2)

The point Q also lies on C, and the tangent to C at Q is parallel to the tangent to C at P.

(c) Find the x-coordinate of Q.

(5)

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10. The curve C has equation

$$y = x^3 - 5x + \frac{2}{x}, \qquad x \neq 0.$$

The points A and B both lie on C and have coordinates $(1, -2)$ and $(-1, 2)$ respectively.

(a) Show that the gradient of C at A is equal to the gradient of C at B.

(5)

(b) Show that an equation for the normal to C at A is

$$4y = x - 9.$$

(4)

The normal to C at A meets the y-axis at the point P. The normal to C at B meets the y-axis at the point Q.

(c) Find the length of PQ.

(4)

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