| Centre<br>No.    |   | Paper Reference |   |   |   | Surname | Initial(s) |           |  |
|------------------|---|-----------------|---|---|---|---------|------------|-----------|--|
| Candidate<br>No. | 6 | 6               | 6 | 3 | / | 0       | 1          | Signature |  |

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Paper Reference's)

## **Edexcel GCE** Core Mathematics C1 **Advanced Subsidiary**



Wednesday 9 January 2008 - Afternoon

Time: 1 hour 30 minutes

Materials required for examination Mathematical Formulae (Green)

Items included with question papers

Calculators may NOT be used in this examination.

## Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions.

You must write your answer for each question in the space following the question.

## Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.

Full marks may be obtained for answers to ALL questions.

The marks for individual questions and the parts of questions are shown in round brackets; e.g. (2).

There are 11 questions in this question paper. The total mark for this paper is 75.

There are 24 pages in this question paper. Any blank pages are indicated.

## Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled. You should show sufficient working to make your methods clear to the Examiner.

Answers without working may not gain full credit.

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Total

http://www.xtremepapers.net

| Find $\int (3x^2 + 4x^5 - 7) dx$ . | (4) |
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| (a) Write down t  | the value of $16^{\frac{1}{4}}$ . |    | (1)   | Lea |
|-------------------|-----------------------------------|----|-------|-----|
| (b) Simplify (16: | $(x^{12})^{\frac{3}{4}}$ .        |    | * * 1 |     |
|                   |                                   |    | (2)   |     |
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3

(Total 3 marks)

| 2 | Cimentif. |
|---|-----------|
|   | Simplify  |

$$\frac{5-\sqrt{3}}{2+\sqrt{3}}$$
,

giving your answer in the form  $a + b\sqrt{3}$ , where a and b are integers.

(4)

Leave blank

(Total 4 marks)

Q3

- **4.** The point A (-6, 4) and the point B (8, -3) lie on the line L.
  - (a) Find an equation for L in the form ax + by + c = 0, where a, b and c are integers.

(b) Find the distance AB, giving your answer in the form  $k\sqrt{5}$ , where k is an integer.

(3)

(Total 7 marks)



5

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)

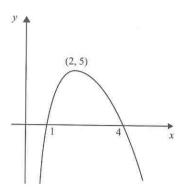


Figure 1

Figure 1 shows a sketch of the curve with equation y = f(x). The curve crosses the x-axis at the points (1, 0) and (4, 0). The maximum point on the curve is (2, 5). In separate diagrams sketch the curves with the following equations. On each diagram show clearly the coordinates of the maximum point and of each point at which the curve crosses the x-axis.

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

(b) 
$$y = f(-x)$$
. (3)

The maximum point on the curve with equation y = f(x + a) is on the y-axis.

(c) Write down the value of the constant a.(1)

$$x_1 = 1,$$
  
 $x_{n+1} = x_n(p + x_n),$ 

where p is a constant  $(p \neq 0)$ .

(a) Find  $x_2$  in terms of p.

(1)

(b) Show that  $x_3 = 1 + 3p + 2p^2$ .

(2)

Given that  $x_3 = 1$ ,

(c) find the value of p,

(3)

(d) write down the value of  $x_{2008}$ .

(2)

The equation

$$x^2 + kx + 8 = k$$

has no real solutions for x.

(a) Show that k satisfies  $k^2 + 4k - 32 < 0$ .

(3)

(b) Hence find the set of possible values of k.

(4)

- 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)



Leave blank

10. The curve C has equation

$$y = (x+3)(x-1)^2$$
.

(a) Sketch C showing clearly the coordinates of the points where the curve meets the coordinate axes.

(4)

(b) Show that the equation of C can be written in the form

$$y = x^3 + x^2 - 5x + k,$$

where k is a positive integer, and state the value of k.

(2)

There are two points on C where the gradient of the tangent to C is equal to 3.

(c) Find the x-coordinates of these two points.

(6)