

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
TOTAL	



General Certificate of Education  
Advanced Subsidiary Examination  
January 2011

# Mathematics

# MPC2

## Unit Pure Core 2

Monday 10 January 2011 9.00 am to 10.30 am

**For this paper you must have:**

- the blue AQA booklet of formulae and statistical tables.

You may use a graphics calculator.

### Time allowed

- 1 hour 30 minutes

### Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Write the question part reference (eg (a), (b)(i) etc) in the left-hand margin.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 75.

### Advice

- Unless stated otherwise, you may quote formulae, without proof, from the booklet.



J A N 1 1 M P C 2 0 1























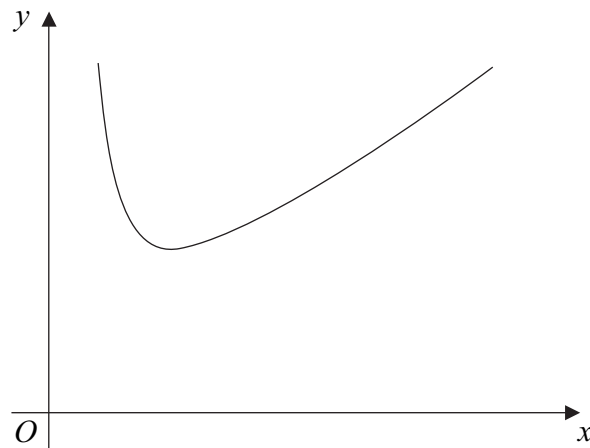








- 7 A curve  $C$  is defined for  $x > 0$  by the equation  $y = x + 3 + \frac{8}{x^4}$  and is sketched below.



- (a) Given that  $y = x + 3 + \frac{8}{x^4}$ , find  $\frac{dy}{dx}$ . (3 marks)
- (b) Find an equation of the tangent at the point on the curve  $C$  where  $x = 1$ . (3 marks)
- (c) The curve  $C$  has a minimum point  $M$ . Find the coordinates of  $M$ . (4 marks)
- (d) (i) Find  $\int \left( x + 3 + \frac{8}{x^4} \right) dx$ . (3 marks)
- (ii) Hence find the area of the region bounded by the curve  $C$ , the  $x$ -axis and the lines  $x = 1$  and  $x = 2$ . (2 marks)
- (e) The curve  $C$  is translated by  $\begin{bmatrix} 0 \\ k \end{bmatrix}$  to give the curve  $y = f(x)$ . Given that the  $x$ -axis is a tangent to the curve  $y = f(x)$ , state the value of the constant  $k$ . (1 mark)

QUESTION  
PART  
REFERENCE

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QUESTION  
PART  
REFERENCE

Area with horizontal dotted lines for writing.

**END OF QUESTIONS**

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