

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Education
Advanced Level Examination
June 2014

Mathematics

MPC3

Unit Pure Core 3

Tuesday 10 June 2014 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 each question in the space provided for that question. If you require extra space, use an AQA supplementary answer book; do **not** use the space provided for a different question.
 - 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.
 - You do not necessarily need to use all the space provided.

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



J U N 1 4 M P C 3 0 1

Answer **all** questions.

Answer each question in the space provided for that question.

- 1 Use Simpson's rule, with five ordinates (four strips), to calculate an estimate for

$$\int_0^{\pi} x^{\frac{1}{2}} \sin x \, dx$$

Give your answer to four significant figures.

[4 marks]

QUESTION
PART
REFERENCE

Answer space for question 1



QUESTION
PART
REFERENCE

Answer space for question 1

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Turn over ►

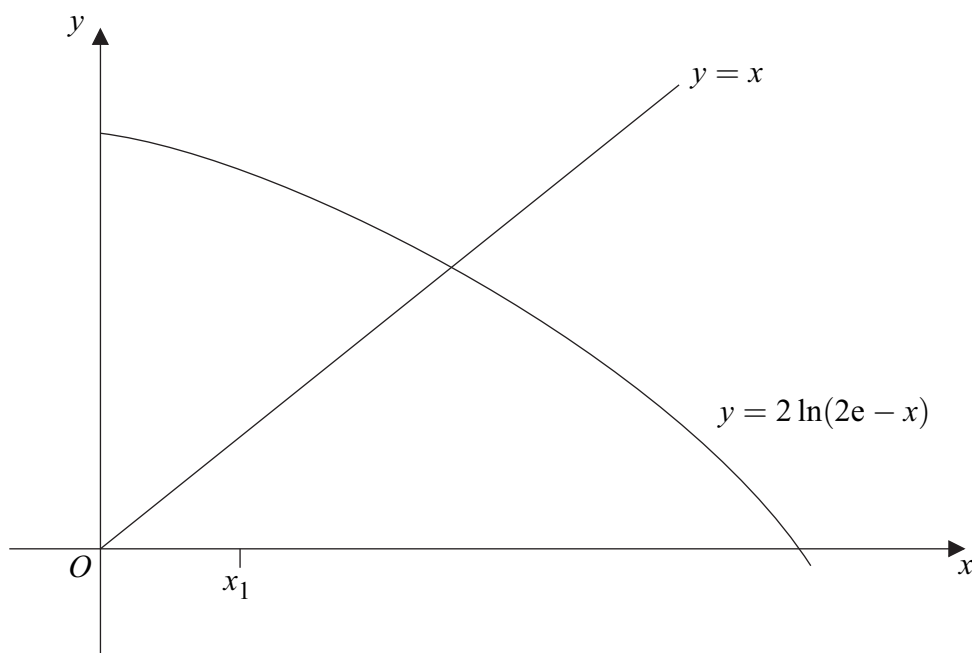


QUESTION
PART
REFERENCE

Answer space for question 2

(c)(iii)

Figure 1



Turn over ►



0 5

QUESTION
PART
REFERENCE

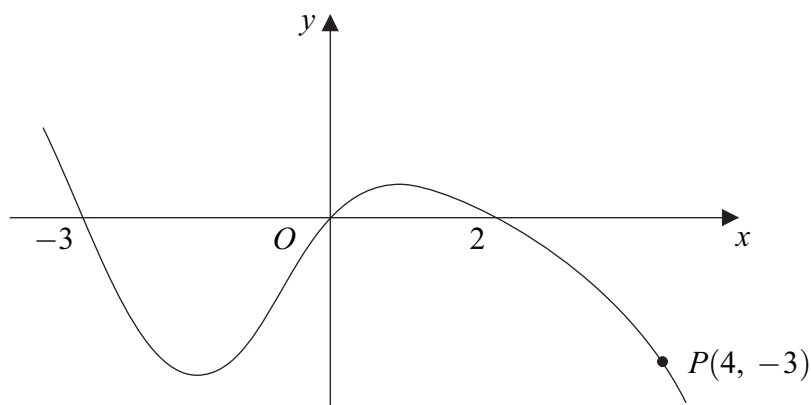
Answer space for question 3

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- 4 The sketch shows part of the curve with equation $y = f(x)$.



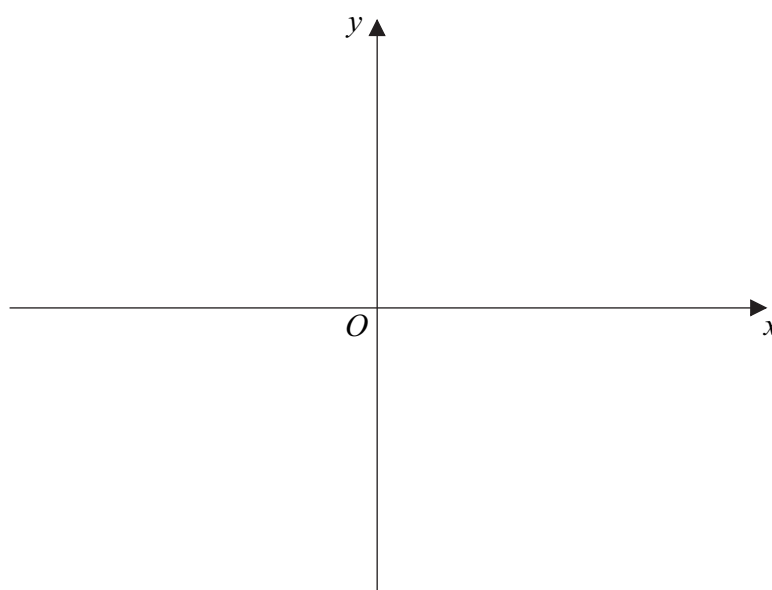
- (a) On **Figure 2** below, sketch the curve with equation $y = -|f(x)|$. **[3 marks]**
- (b) On **Figure 3** on the page opposite, sketch the curve with equation $y = f(|2x|)$. **[2 marks]**
- (c) (i) Describe a sequence of two geometrical transformations that maps the graph of $y = f(x)$ onto the graph of $y = f(2x + 2)$. **[4 marks]**
- (ii) Find the coordinates of the image of the point $P(4, -3)$ under the sequence of transformations given in part (c)(i). **[2 marks]**

QUESTION
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REFERENCE

Answer space for question 4

(a)

Figure 2

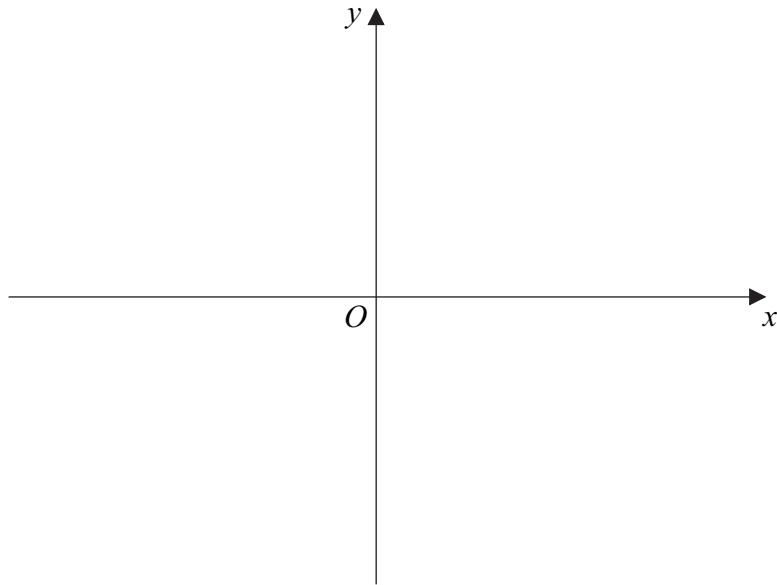


QUESTION
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REFERENCE

Answer space for question 4

(b)

Figure 3



A series of horizontal dotted lines for writing the answer.

Turn over ►



QUESTION
PART
REFERENCE

Answer space for question 5

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QUESTION
PART
REFERENCE

Answer space for question 6

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7 Use the substitution $u = 3 - x^3$ to find the exact value of $\int_0^1 \frac{x^5}{3 - x^3} dx$.

[6 marks]

QUESTION
PART
REFERENCE

Answer space for question 7



QUESTION
PART
REFERENCE

Answer space for question 7

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QUESTION
PART
REFERENCE

Answer space for question 8

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QUESTION
PART
REFERENCE

Answer space for question 8

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QUESTION
PART
REFERENCE

Answer space for question 8

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END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

