

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				
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Pearson Edexcel International Advanced Level

Time 1 hour 30 minutes

Paper
reference

WMA13/01

Mathematics

International Advanced Level

Pure Mathematics P3

You must have:

Mathematical Formulae and Statistical Tables (Yellow), calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 10 questions in this question paper. The total mark for this paper is 75.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ►

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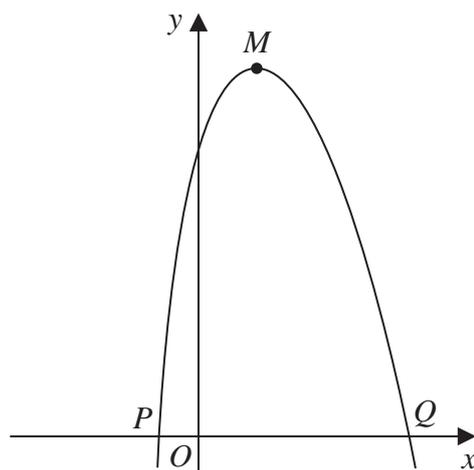


Figure 1

Figure 1 shows a sketch of part of the curve with equation

$$y = 6\ln(2x + 3) - \frac{1}{2}x^2 + 4 \quad x > -\frac{3}{2}$$

The curve cuts the negative x -axis at the point P , as shown in Figure 1.

- (a) Show that the x coordinate of P lies in the interval $[-1.25, -1.2]$ (2)

The curve cuts the positive x -axis at the point Q , also shown in Figure 1.

Using the iterative formula

$$x_{n+1} = \sqrt{12\ln(2x_n + 3) + 8} \quad \text{with } x_1 = 6$$

- (b) (i) find, to 4 decimal places, the value of x_2
 (ii) find, by continued iteration, the x coordinate of Q . Give your answer to 4 decimal places. (3)

The curve has a maximum turning point at M , as shown in Figure 1.

- (c) Using calculus and showing each stage of your working, find the x coordinate of M . (4)

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