

Write your name here

Surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Further Pure Mathematics F1

Advanced/Advanced Subsidiary

Tuesday 27 January 2015 – Morning
Time: 1 hour 30 minutes

Paper Reference

WFM01/01**You must have:**

Mathematical Formulae and Statistical Tables (Blue)

Total Marks

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. 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). Coloured pencils and highlighter pens must not be used.
- **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.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

Information

- 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.

Turn over ►

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**PEARSON**

$$f(x) = x^3 - 3x^2 + \frac{1}{2\sqrt{x^5}} + 2, \quad x > 0$$

- (a) Show that the equation $f(x) = 0$ has a root α in the interval $[2, 3]$. (2)
- (b) Taking 3 as a first approximation to α , apply the Newton-Raphson process once to $f(x)$ to find a second approximation to α . Give your answer to 3 decimal places. (5)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

3. Given that $z = x + iy$, where x and y are real numbers, solve the equation

$$(z - 2i)(z^* - 2i) = 21 - 12i$$

where z^* is the complex conjugate of z .

(6)



(a) Show that the equation of the normal to the curve C at the point P is

$$y + px = 6p + 3p^3 \quad (5)$$

This normal crosses the curve C again at the point Q .

Given that $p = 2$ and that S is the focus of the parabola, find

(b) the coordinates of the point Q ,

(5)

(c) the area of the triangle PQS . (4)



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Question 4 continued

Lined area for writing the answer to Question 4.



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Question 5 continued

Lined area for writing the answer to Question 5.



(i) $\mathbf{A} = \begin{pmatrix} 3 & 0 \\ 0 & 1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} -\frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} \end{pmatrix}$

- Show that $\det \mathbf{M} \neq 0$ for all values of k . (4)

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Question 6 continued

[illegible]

Question 7 continued



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Question 8 continued

Handwriting lines for Question 8 continued.

Q8

(Total 12 marks)

TOTAL FOR PAPER: 75 MARKS

END

