

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel  
Level 3 GCE**

Centre Number

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Candidate Number

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Sample Assessment Material

(Time: 1 hour 30 minutes)

Paper Reference **9FM0/01**

**Further Mathematics**

**Advanced**

**Paper 1: Core Pure Mathematics 1**

**You must have:**

Mathematical Formulae and Statistical Tables, calculator

Total Marks

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**Candidates may use any calculator permitted by Pearson regulations. Calculators must not have the facility for algebraic 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.
- Answers should be given to three significant figures unless otherwise stated.

### Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 8 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.

Turn over ►

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4.

$$f(x) = \begin{cases} \frac{kx}{x^2 + 6} & \text{for } 0 \leq x < 3 \\ \frac{k}{x^2 - 4} & \text{for } 3 \leq x \end{cases}$$

where  $k$  is a positive constant.

The area between the curve  $y = f(x)$  and the positive  $x$ -axis is  $\frac{1}{4}$

Show that

$$k = \frac{1}{\ln a}$$

where  $a$  is a constant to be determined.

(8)

DO NOT WRITE IN THIS AREA

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