

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 **9FM0/3A**

**Further Mathematics**  
**Advanced**  
**Paper 3A: Further Pure Mathematics 1**

**You must have:**

Mathematical Formulae and Statistical Tables, calculator

Total Marks

**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 9 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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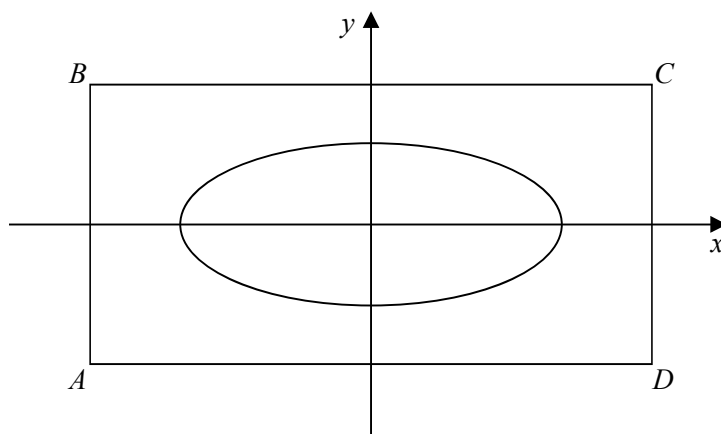


Figure 1

Figure 1 shows the plan for a rectangular garden  $ABCD$ .

In the middle of the garden is a large pond that may be modelled as an ellipse.

The length of the major axis of the ellipse is twice the length of the minor axis of the ellipse. The line  $AB$  and the line  $CD$  are modelled as the directrices of the ellipse.

The ellipse and the rectangle  $ABCD$  lie in the same horizontal plane.

Given that the length of the garden,  $AD$ , is  $\frac{16}{3}\sqrt{3}$  metres,

- (a) find an equation of the ellipse. (6)

Two water features, modelled as particles, are to be placed in the pond. The sum of the horizontal distances from the water features to any point on the edge of the pond is constant.

- (b) Find the coordinates of the points at which the water features are to be placed, according to the model. (2)

Gnomes, modelled as particles, are to be placed on the edge of the pond. Each gnome will be exactly 2 m from a water feature.

- (c) Find all the possible coordinates for the gnomes. (5)

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