

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel  
Level 3 GCE**

Centre Number

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

Candidate Number

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

Paper  
reference

**8FM0/21**

## Further Mathematics

**Advanced Subsidiary**

**Further Mathematics options**

**21: Further Pure Mathematics 1  
(Part of options A, B, C and D)**

**You must have:**

Mathematical Formulae and Statistical Tables (Green), calculator

Total Marks

**Candidates may use any calculator allowed 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.
- The total mark for this part of the examination is 40. There are 5 questions.
- 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.
- Good luck with your examination.

Turn over ►

P66658A

©2021 Pearson Education Ltd.

1/1/1/1/1



Pearson

1. Use algebra to determine the values of  $x$  for which

$$x(x - 1) > \frac{x - 1}{x}$$

giving your answer in set notation.

(6)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA





2. The variables  $x$  and  $y$  satisfy the differential equation

$$\frac{d^2y}{dx^2} + 15\frac{dy}{dx} - 3y^2 = 2x$$

where  $y = 1$  at  $x = 0$  and where  $y = 2$  at  $x = 0.1$

Use the approximations

$$\left(\frac{d^2y}{dx^2}\right)_n \approx \frac{(y_{n+1} - 2y_n + y_{n-1}))}{h^2} \text{ and } \left(\frac{dy}{dx}\right)_n \approx \frac{(y_{n+1} - y_{n-1}))}{2h}$$

with  $h = 0.1$  to find an estimate for the value of  $y$  when  $x = 0.3$

(6)





































