

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

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Candidate Number

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Sample Assessment Materials for first teaching September 2018

(Time: 1 hour 30 minutes)

Paper Reference **WFM02/01**

Mathematics

International Advanced Subsidiary/Advanced Level
Further Pure Mathematics FP2

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 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 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.
- 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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Answer ALL questions. Write your answers in the spaces provided.

1. Using algebra, find the set of values of x for which

$$\frac{x}{x+2} < \frac{2}{x+5}$$

(7)

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Question 1 continued

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Q1

(Total for Question 1 is 7 marks)

- (b) Hence show that

$$\sum_{r=1}^n \frac{2}{(r+6)(r+8)} = \frac{n(an+b)}{56(n+7)(n+8)}$$

where a and b are integers to be found. (4)

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Question 2 continued

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Question 2 continued

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(Total for Question 2 is 5 marks)

Q2

- $$\frac{dy}{dx} + 2xy = xe^{-x^2}y^3 \quad (\text{I})$$

$$\frac{dz}{dx} - 4xz = -2xe^{-x^2} \quad (\text{II})$$

- (b) Solve differential equation (II) to find z as a function of x . (5)

- (c) Hence find the general solution of differential equation (I), giving your answer in the form $y^2 = f(x)$. (1)

Question 3 continued

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Question 3 continued

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(Total for Question 3 is 10 marks)

Q3

Grading boxes.

- $$w = \frac{z-1}{z+1}, \quad z \neq -1$$

(a) Show that C is a circle and find its centre and radius.

(7)

(b) Sketch circle C on an Argand diagram and shade and label region R .

(2)

Question 4 continued

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Question 4 continued

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(Total for Question 4 is 9 marks)

Q4

(a) show that

$$\frac{d^2y}{dx^2} = 2 \cot x + 2 \cot^3 x \quad (3)$$

(b) Hence show that

$$\frac{d^3y}{dx^3} = p \cot^4 x + q \cot^2 x + r$$

where p , q and r are integers to be found. (3)

(c) Find the Taylor series expansion of $\cot x$ in ascending powers of $\left(x - \frac{\pi}{3}\right)$ up to and including the term in $\left(x - \frac{\pi}{3}\right)^3$. **(3)**

Question 5 continued

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(Total for Question 5 is 9 marks)

- $$\frac{d^2y}{dx^2} - 2\frac{dy}{dx} - 3y = 2\sin x \quad (\text{I})$$

(b) find the particular solution of differential equation (I).

Question 6 continued

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(Total for Question 6 is 13 marks)

Question 7 continued

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Question 7 continued

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Q7

(Total for Question 7 is 8 marks)

Question 8 continued

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Question 8 continued

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Question 8 continued

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TOTAL FOR PAPER IS 75 MARKS