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Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

AS

FURTHER MATHEMATICS

Paper 2 – Statistics

Thursday 17 May 2018

Afternoon

Time allowed: 1 hour 30 minutes

Materials

- You must have the AQA formulae and statistical tables booklet for A-level Mathematics and A-level Further Mathematics.
- You should have a scientific calculator that meets the requirements of the specification. (You may use a graphical calculator.)
- You must ensure you have the other optional Question Paper/Answer Book for which you are entered (**either** Discrete **or** Mechanics). You will have 1 hour 30 minutes to complete **both** papers.

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer each question in the space provided for that question. If you require extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do **not** write outside the box around each page.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 40.

Advice

- Unless stated otherwise, you may quote formulae, without proof, from the booklet.
- You do not necessarily need to use all the space provided.

For Examiner's Use	
Question	Mark
1	
2	
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TOTAL	



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Answer **all** questions in the spaces provided.

- 1** Let X be a continuous random variable with probability density function given by

$$f(x) = \begin{cases} \frac{3}{4}x(2-x) & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$

Find $P(X = 1)$

Circle your answer.

[1 mark]

0 $\frac{1}{2}$ $\frac{3}{4}$ $\frac{27}{32}$

- 2** The discrete random variable Y has a Poisson distribution with mean 3

Find the value of $P(Y > 1)$ to three significant figures.

Circle your answer.

[1 mark]

0.149 0.199 0.801 0.950



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7 (b) For your test carried out in part **(a)** state, in context, the meaning of a Type 1 error.

[1 mark]

7 (c) Explain why the model used in part **(a)** might be invalid.

[1 mark]

Turn over for the next question

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- 8** An insurance company groups its vehicle insurance policies into two categories, car insurance and motorbike insurance.

The number of claims in a random sample of 80 policies was monitored and the results summarised in contingency **Table 1**.

Table 1

		Number of claims				Total
		0	1	2	3 or more	
Type of insurance policy	Car	9	10	11	5	35
	Motorbike	19	13	8	5	45
	Total	28	23	19	10	80

The insurance company decides to carry out a χ^2 -test for association between number of claims and type of insurance policy using the information given in **Table 1**.

- 8 (a)** The contingency table shown in **Table 2** gives some of the exact expected frequencies for this test.

Complete **Table 2** with the missing exact expected values.

[2 marks]

Table 2

		Number of claims			
		0	1	2	3 or more
Type of insurance policy	Car		10.0625		4.375
	Motorbike			10.6875	



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