



Cambridge International AS & A Level

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MATHEMATICS

9709/62

Paper 6 Probability & Statistics 2

October/November 2022

1 hour 15 minutes

You must answer on the question paper.

You will need: List of formulae (MF19)

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages. Any blank pages are indicated.

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Exactly 3 faults are found in the randomly selected 30 m^2 of cloth.

- (c) Carry out the test at the 5% significance level. [2]

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Later a similar test was carried out at the 5% significance level, using another randomly selected 30 m^2 of cloth.

- (d) Given that the number of faults actually has a Poisson distribution with mean 0.5 per 10 m^2 , find the probability of a Type II error. [2]

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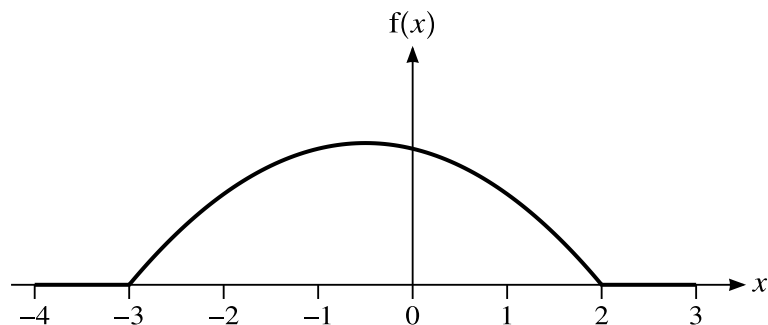
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The diagram shows the graph of the probability density function, f , of a random variable X which takes values between -3 and 2 only.

- (a) Given that the graph is symmetrical about the line $x = -0.5$ and that $P(X < 0) = p$, find $P(-1 < X < 0)$ in terms of p . [2]

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- (b) It is now given that the probability density function shown in the diagram is given by

$$f(x) = \begin{cases} a - b(x^2 + x) & -3 \leq x \leq 2, \\ 0 & \text{otherwise,} \end{cases}$$

where a and b are positive constants.

- (i) Show that $30a - 55b = 6$. [3]

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(ii) By substituting a suitable value of x into $f(x)$, find another equation relating a and b and hence determine the values of a and b . [3]

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