



Cambridge International AS & A Level

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MATHEMATICS

9709/62

Paper 6 Probability & Statistics 2

February/March 2025

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.





- [5]

[illegible]

- The results for a random sample of 60 adults who completed the questionnaire this year are summarised as follows.

(a) Find an unbiased estimate of $E(T)$, and show that an unbiased estimate of $\text{Var}(T)$ is 14.44. [3]

This image shows a full page of a handwriting practice worksheet. It consists of multiple rows of horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.



(b) Test at the 2% significance level whether the population mean time for this year is less than 62.4 seconds. [5]

(c) State, with a reason, whether it was necessary to use the Central Limit Theorem in your answer to part (b). [1]



3 The random variable X has the distribution $\text{Po}(1.5)$.

(a) Find $P(X \geq 3)$.

[2]

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(b) Find the probability that the sum of three independent values of X is between 3 and 5 inclusive. [3]

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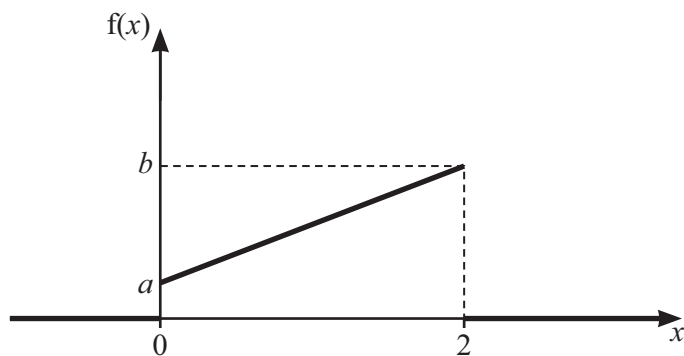
- Find the value of n .

[5]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.



4 (a)



The diagram shows the graph of the probability density function, f , of a random variable X . The graph is a straight line from $(0, a)$ to $(2, b)$, where a and b are positive constants. Elsewhere, $f(x) = 0$.

- (i) Show that $b = 1 - a$. [2]

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- (ii) Given that $E(X) = 1.2$, find the value of a . [5]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.




$$g(t) = \begin{cases} \frac{1}{2} \cos t & -\frac{1}{2}\pi \leq t \leq \frac{1}{2}\pi, \\ 0 & \text{otherwise.} \end{cases}$$

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[3]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

- Nikki's friend says, "This survey is about sports facilities, so you should choose a sample of students from the school sports teams."

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-

(b) Calculate an approximate 95% confidence interval for the proportion of students who think that the sports facilities are good. [3]

This image shows a full page of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.



The width of the 99% confidence interval is double the width of the $x\%$ confidence interval.

[4]

[illegible]

This image shows a full page of a document template. It consists of approximately 28 evenly spaced horizontal dotted lines across the entire width of the page, providing a guide for handwriting practice or structured note-taking. The background is plain white, and there are no margins, headers, or footers present.





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