

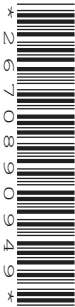


Cambridge International AS & A Level

CANDIDATE
NAME

CENTRE
NUMBER

CANDIDATE
NUMBER



MATHEMATICS9709/62

Paper 6 Probability & Statistics 2May/June 2024

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 [].

[illegible][illegible]

Henri's first two student numbers are 567 and 109.

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$$n = 30 \qquad \Sigma x = 610 \qquad \Sigma x^2 = 12405$$

- [illegible]

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[4]

[illegible]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5 The number of goals scored by a sports team in the first half of any match has the distribution $X \sim \text{Po}(3.1)$. The number of goals scored by the same team in the second half of any match has the distribution $Y \sim \text{Po}(2.4)$. You may assume that the distributions of X and Y are independent.

(a) Find $P(X < 4)$. [2]

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(b) Find the probability that, in a randomly chosen match, the team scores at least 5 goals. [3]

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This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Assume that the standard deviation of the masses is 10 grams.

- (a) Test at the 2.5% significance level whether the mean mass of cereal boxes filled by the machine has decreased. [5]

[illegible]

- [illegible]

7 The probability density function, f , of a random variable X is given by

$$f(x) = \begin{cases} k(1 + \cos x) & 0 \leq x \leq \pi, \\ 0 & \text{otherwise,} \end{cases}$$

where k is a constant.

(a) Show that $k = \frac{1}{\pi}$. [3]

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(b) Verify that the median of X lies between 0.83 and 0.84 . [3]

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[4]

[illegible]

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 margins or additional markings.

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