



Cambridge International AS & A Level

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MATHEMATICS

9709/62

Paper 6 Probability & Statistics 2

May/June 2026

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. Do **not** use correction fluid or tape.
- 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.





1 Ten random values of a variable X are given below.

8.1 8.3 9.5 10.1 7.9 8.7 9.1 8.8 9.4 9.0

Calculate unbiased estimates of the population mean and variance of X .

[3]

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines, providing a guide for letter height and placement. The lines are evenly spaced across the entire page, leaving ample room for writing practice. There is no text or other markings on the page.



- 2 Each week, Birgitte takes three train journeys. The times, in minutes, for these journeys have the independent distributions $A \sim N(28, 15)$, $B \sim N(23, 8)$ and $C \sim N(99, 24)$.

For a randomly chosen week, find $P(C > 2(A + B))$.

[5]

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



- (a)** State suitable null and alternative hypotheses for the test.

[1]

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(b) Find the smallest value of X that would result in rejecting the null hypothesis.

[4]

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(c) State the value of P(Type I error).

[1]

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- 4 The random variables D and E have the independent distributions $D \sim \text{Po}(1.7)$ and $E \sim \text{Po}(2.1)$.

(a) Find $P(D+E < 4)$. [3]

[illegible]

(b) Given that $D+E < 4$, find $P(D = 1)$. [3]

[illegible]



- (c) The random variable T is the total of 100 randomly chosen values of D .

Use the normal approximation to the Poisson distribution to find $P(T > 190)$.

[4]

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.



- 5 Eric throws darts at a target. The probability that he will hit the centre of the target on one throw is p .
- (a) Eric takes 100 throws and hits the centre x times. He uses this result to find an approximate 95% confidence interval for p . The width of this interval is 0.165 correct to 3 significant figures.

Find the two possible values of x .

[4]

[illegible]



Eric takes some more throws. He uses his results to calculate two approximate α % confidence intervals for p (where $\alpha > 90$).

It is given that the probability that exactly one of these two intervals contains the true value of p is 0.1128.

(b) Find the value of α .

[3]

[illegible]



- 6** The length of time, T minutes, that customers spend in a certain shop has the distribution $N(\mu, 9.2)$. Last year the value of μ was 12.4. The manager of the shop wants to test whether the value of μ has decreased this year. She chooses a random sample of 75 customers and finds that the sample mean, $\bar{T}$, for these customers is 11.9.

- (a) Test at the 5% significance level whether the value of μ is less than 12.4. [5]

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.

- (b)** Explain whether it was necessary to use the Central Limit Theorem in your answer to **6(a)**. [1]

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- (c) Later the manager chooses another large random sample of n customers. She finds that, for these customers, $\bar{T} = 11.8$. She carries out a similar test at the 5% significance level, and the conclusion is that there is evidence that the value of μ is less than 12.4.

Find the range of possible values of n .

[3]

[illegible]



7 A random variable X has the probability density function

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

where a is a constant.

(a) Show that $E(X) = k\sqrt{2}$, where k is a constant to be found.

[6]

[illegible]



(b) Find the exact value of the median of X .

[4]

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