



# Cambridge International AS & A Level

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## MATHEMATICS

9709/62

Paper 6 Probability &amp; Statistics 2

May/June 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.



**2**

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- [illegible]

Carry out a test at the 2.5% significance level of whether the mean height of plants treated with fertiliser is greater than 2.3 m. [5]

This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook 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.

- 3** It is known that 1.8% of children in a certain country have not been vaccinated against measles. A random sample of 200 children in this country is chosen.
- (a)** Use a suitable approximating distribution to find the probability that there are fewer than 3 children in the sample who have not been vaccinated against measles. [4]

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- (b)** Justify your approximating distribution. [2]

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- [illegible]

The officer notes that, during a randomly chosen 2-minute period on a weekday morning, exactly 5 cars arrive at the junction.

- (c) Carry out the test. [2]

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- (d) State, with a reason, whether it is possible that a Type I error has been made in carrying out the test in part (c). [1]

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The number of cars arriving at another junction on a weekday morning also has a Poisson distribution with mean 4.6 per minute.

- (e) Use a suitable approximating distribution to find the probability that more than 300 cars will arrive at this junction in an hour. [3]

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5 A random variable  $X$  has probability density function given by

$$f(x) = \begin{cases} \frac{3}{16}(4x - x^2) & 2 \leq x \leq 4, \\ 0 & \text{otherwise.} \end{cases}$$

(a) Show that  $E(X) = \frac{11}{4}$ . [3]

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(b) Find  $\text{Var}(X)$ . [3]

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[illegible]

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- 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 or typing. There are no margins, text, or other markings on the page.

[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.

[5]

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.

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.

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