



Cambridge International AS & A Level

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MATHEMATICS

9709/52

Paper 5 Probability & Statistics 1

May/June 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 **12** pages.



Draw up the probability distribution table for X . [3]

[illegible]

Use a suitable approximation to find the probability that more than 120 of these residents own a bicycle. [5]

[5]



(a) Find the probability that both marbles selected are the same colour. [2]

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- 4 Vehicles approaching a certain road junction from Bromley must go either left, right or straight on. Over time, it is known that 30% turn left, 25% turn right and 45% go straight on. The driver of each vehicle chooses a direction independently of all other drivers.

- (a) Find the probability that the next three vehicles approaching this junction from Bromley all go in different directions. [2]

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- (b) Find the probability that, from the vehicles approaching this junction from Bromley today, the 1st vehicle to go left is before the 9th vehicle. [2]

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- (c) Find the probability that, from the vehicles approaching this junction from Bromley today, the 2nd vehicle to go left is the 7th vehicle. [2]

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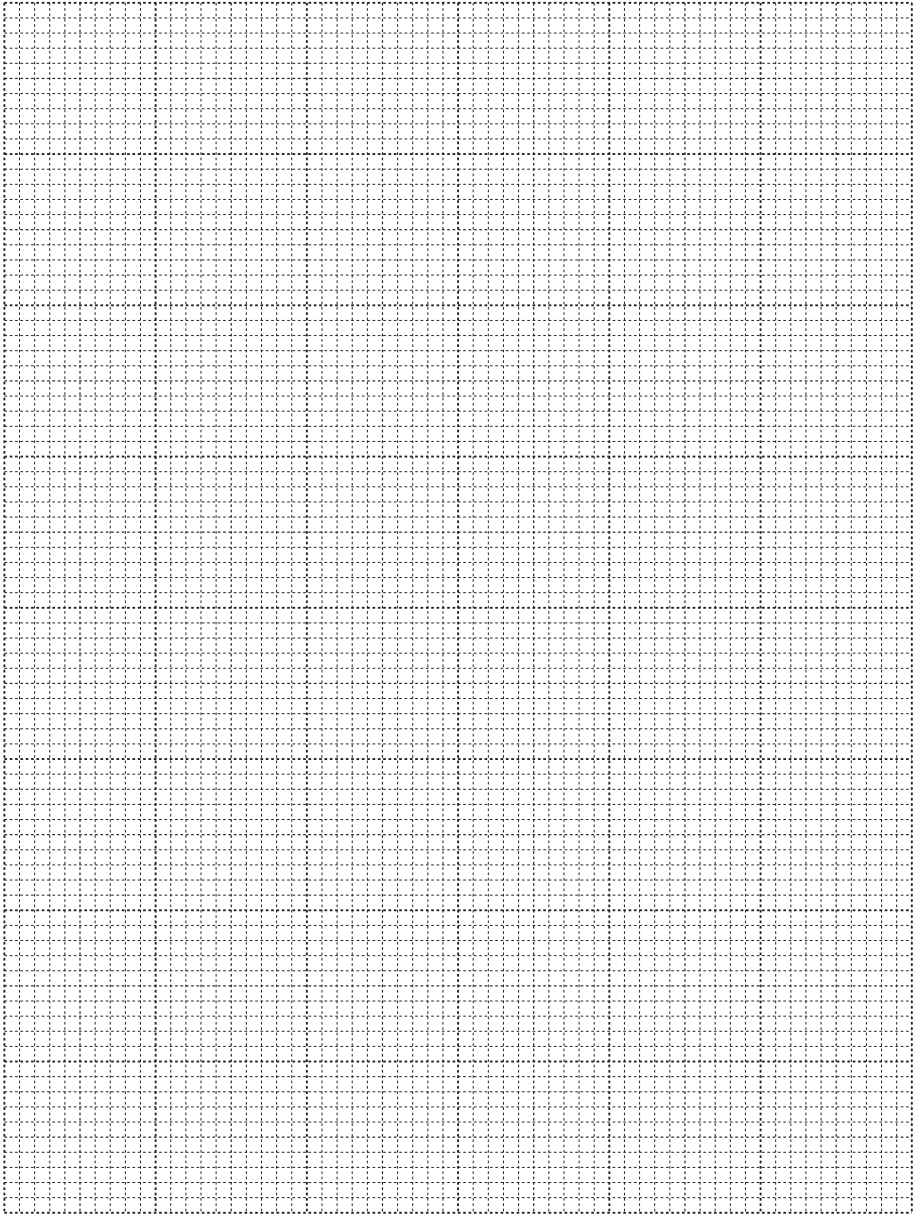




5 The times taken, t minutes, by 300 students to travel to Hollowton College are recorded. The results are summarised in the table below.

Time (t minutes)	$t \leq 10$	$t \leq 20$	$t \leq 30$	$t \leq 40$	$t \leq 60$	$t \leq 90$
Cumulative frequency	34	86	142	208	265	300

(a) On the grid, draw a cumulative frequency graph to illustrate this information. [2]



(b) 120 students take more than k minutes to travel to college. Use your graph to estimate the value of k . [2]

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[illegible]



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[illegible]



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Five letters are selected from the 10 letters in the word AMALGAMATE.

- (c) Find the number of different selections in which the five letters include at least one M and at least two As. [3]

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7 Kestrels are birds whose adult wingspans are normally distributed with mean 74.8 cm and standard deviation 3.2 cm. A random sample of 120 adult kestrels is selected.

(a) How many of these 120 adult kestrels would you expect to have wingspan between 72.4 cm and 76.3 cm? [4]

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The masses of adult kestrels are normally distributed with mean μ kg and standard deviation σ kg. It is known that 20% of adult kestrels have mass greater than 0.202 kg and 28% have mass less than 0.185 kg.

(b) Find the value of μ and the value of σ . [5]

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10 adult kestrels are selected at random.

- (c) Find the probability that fewer than 3 have masses greater than 0.202 kg. [3]

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