



Cambridge International AS & A Level

CANDIDATE
NAME
CENTRE
NUMBER

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MATHEMATICS

9709/53

Paper 5 Probability & Statistics 1

October/November 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 [].

This document has **12** pages. Any blank pages are indicated.



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1 30% of the residents of Wimfield own an electric car. Three residents are chosen at random.

- (a) Find the probability that either all three own an electric car or none of them owns an electric car. [2]

[illegible]

A random sample of 125 of the residents of Wimfield is selected.

- (b) Use a suitable approximation to find the probability that more than 45 of these residents own an electric car. [5]

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4. Molimba have a height between 170 cm and 180 cm, giving your answer correct to 1 decimal place.

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- 4 On a certain day, the heights of 150 sunflower plants grown by children at a local school are measured, correct to the nearest cm. These heights are summarised in the following table.

Height (cm)	10–19	20–29	30–39	40–44	45–49	50–54	55–59
Frequency	10	18	32	42	28	14	6

- (a) Draw a cumulative frequency graph to illustrate the data.

[4]



- (b) Use your graph to estimate the 30th percentile of the heights of the sunflower plants.

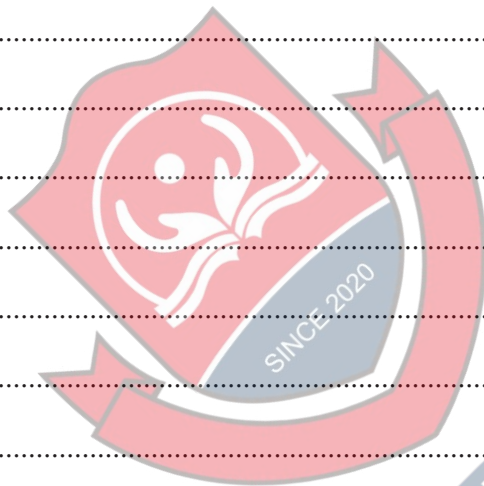
[2]

.....

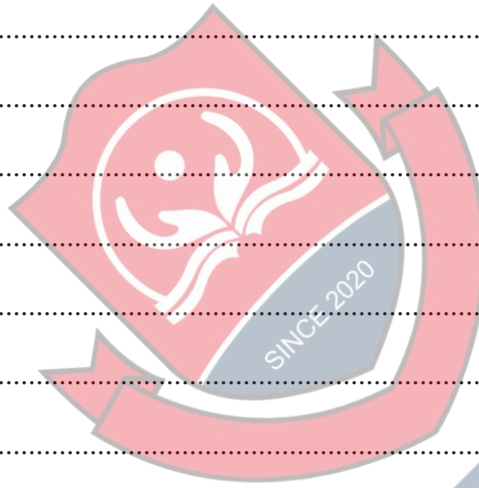
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The logo is a red shield-shaped emblem. Inside the shield, there is a white stylized sun or flower-like symbol. Below this symbol, the text 'SINCE 2020' is written in white. A red banner or ribbon curves around the bottom and sides of the shield. Overlaid on the right side of the page is a large, light blue diagonal watermark that reads '4Uadmission'.

A large, light blue watermark reading "4Uadmission" is oriented diagonally across the page. In the top-left corner, there is a circular logo with a red border. Inside the logo, a stylized red and white flower is on the left, and a blue-grey shape on the right contains the text "SINCE 2020" in white.

- 5 A factory produces chocolates. 30% of the chocolates are wrapped in gold foil, 25% are wrapped in red foil and the remainder are unwrapped.

Indigo chooses 8 chocolates at random from the production line.

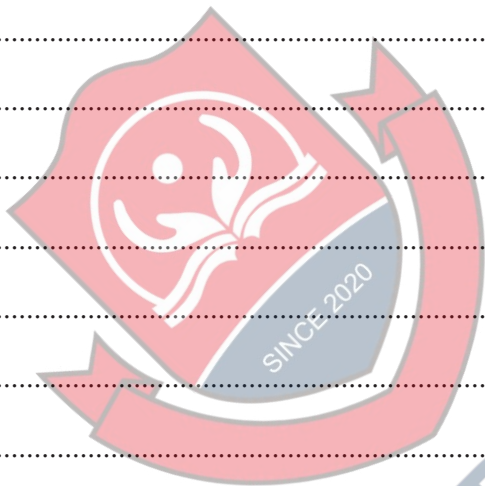
- (a) Find the probability that she obtains no more than 2 chocolates that are wrapped in red foil. [3]

Jake chooses chocolates one at a time at random from the production line.

- (b) Find the probability that the first time he obtains a chocolate that is wrapped in red foil is before the 7th choice. [2]

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- [illegible]

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