



Cambridge International AS & A Level

CANDIDATE
NAME

CENTRE
NUMBER

CANDIDATE
NUMBER



MATHEMATICS9709/52

Paper 5 Probability & Statistics 1May/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 [].

This document has **16** pages. Any blank pages are indicated.

1 Rajesh applies once every year for a ticket to a music festival. The probability that he is successful in any particular year is 0.3, independently of other years.

(a) Find the probability that Rajesh is successful for the first time on his 7th attempt. [1]

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(b) Find the probability that Rajesh is successful for the first time before his 6th attempt. [2]

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(c) Find the probability that Rajesh is successful for the second time on his 10th attempt. [2]

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- 2 Seva has a coin which is biased so that when it is thrown the probability of obtaining a head is $\frac{1}{3}$. He also has a bag containing 4 red marbles and 5 blue marbles.

Seva throws the coin. If he obtains a head, he selects one marble from the bag at random. If he obtains a tail, he selects two marbles from the bag at random and without replacement.

- (a) Find the probability that Seva selects at least one red marble. [3]

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- (b) Find the probability that Seva obtains a head given that he selects no red marbles. [2]

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- [illegible]

[3]

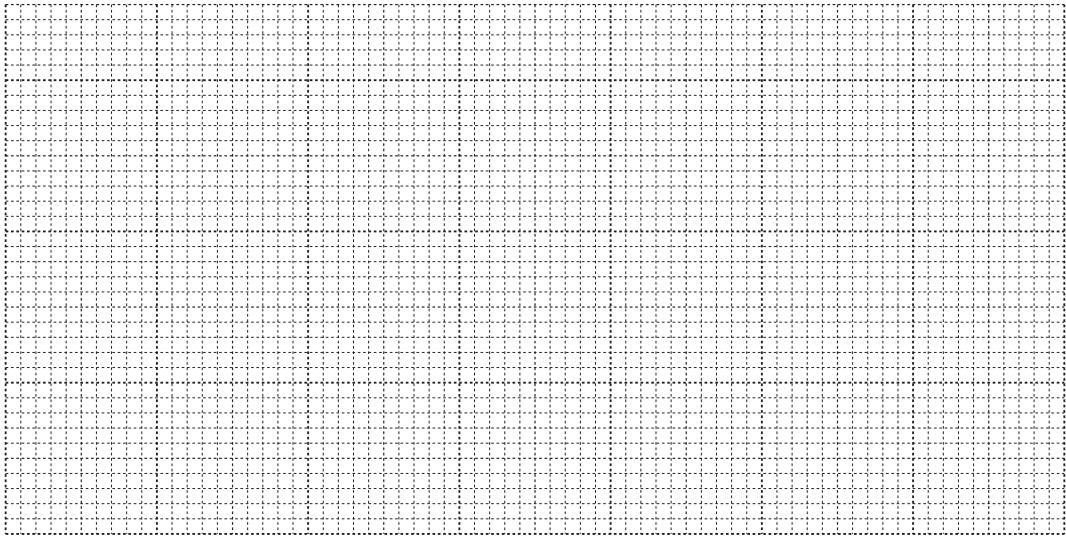
[illegible]

Key: 2 | 31 | 5 means \$31 200 for a Petral employee and \$31 500 for a Ravon employee.

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- This image shows a full page of white paper designed for handwriting practice. It features 18 evenly spaced, horizontal dashed lines that run across the entire width of the page. The lines are thin and black, providing a guide for letter height and placement. There are no margins, text, or other markings on the page.

The median salary of the Ravon employees is \$33 800, the lower quartile is \$32 000 and the upper quartile is \$34 400.

- (b) Represent the data shown in the back-to-back stem-and-leaf diagram by a pair of box-and-whisker plots in a single diagram. [3]



- (c) Comment on whether the mean or the median would be a better representation of the data for the employees at Petral. [1]

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[illegible]

[illegible]

- 25% of residents classified their service as good.
- 60% of residents classified their service as satisfactory.
- 15% of residents classified their service as poor.

(a) A random sample of 110 residents of Mahjong is chosen.

Use a suitable approximation to find the probability that fewer than 22 residents classified their bus service as good. [5]

[illegible]

- (b) For a random sample of 10 residents of Mahjing, find the probability that fewer than 8 classified their bus service as good or satisfactory. [3]

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- (c) Three residents of Mahjing are selected at random.
- Find the probability that one resident classified the bus service as good, one as satisfactory and one as poor. [2]

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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 other markings or text present.

Additional page

If you use the following lined page to complete the answer(s) to any question(s), the question number(s) must be clearly shown.

Lined area for writing answers.

BLANK PAGE

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