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CAMBRIDGE
International Education

Cambridge International AS & A Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1690746076

MATHEMATICS **9709/55**

Paper 5 Probability & Statistics 1 **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 [ ].

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1 A summary of 60 values of x gives

$$\Sigma(x-c) = 642, \qquad \Sigma(x-c)^2 = 32\,460,$$

where c is a constant.

(a) Find the standard deviation of these 60 values of x. [2]

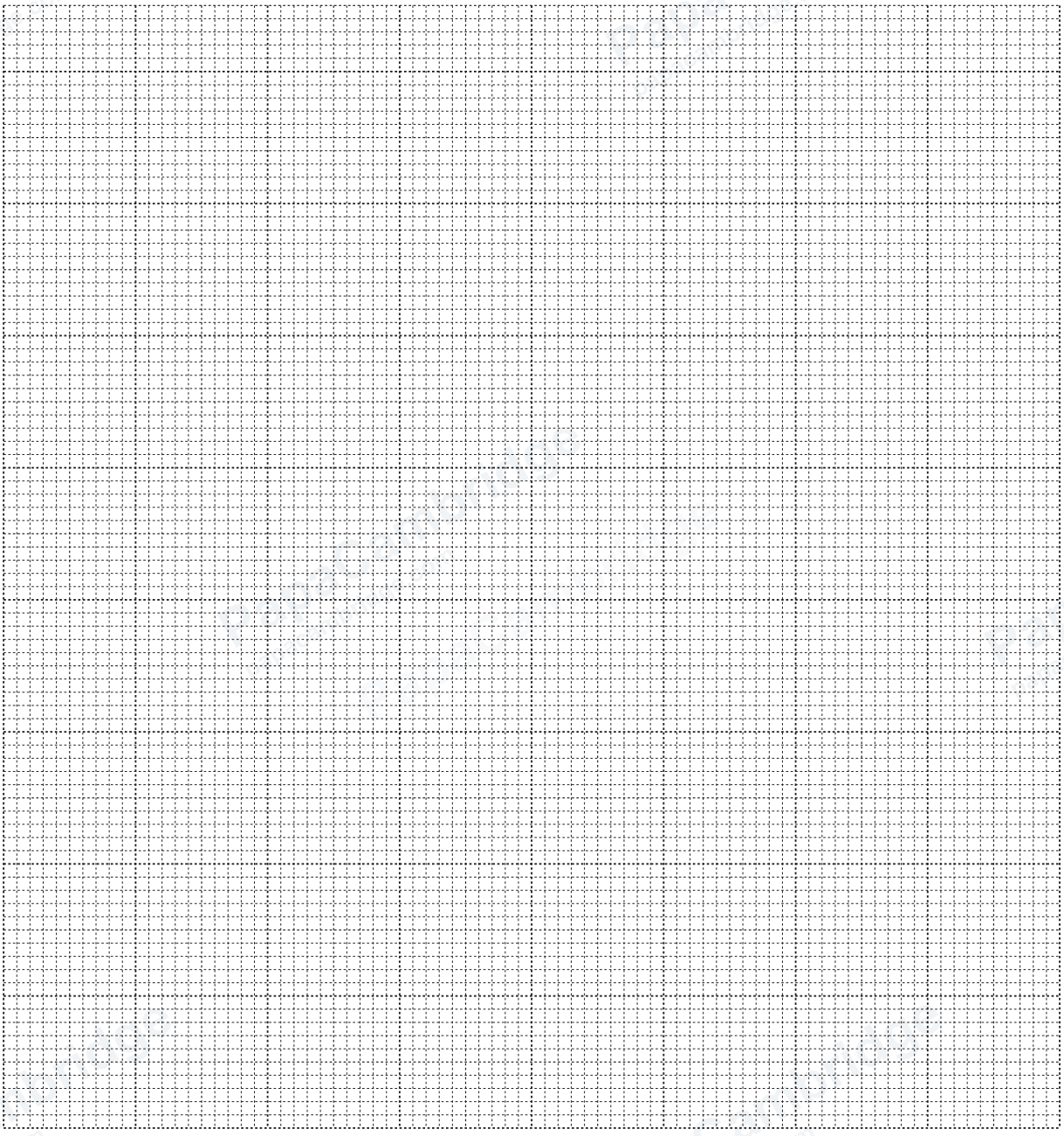
(b) Given that the mean of these 60 values of x is 95.7, find the value of c. [2]

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2 The time taken, in seconds, to complete a puzzle was recorded for 160 pupils at a school. These times are summarised in the table.

time taken (t seconds)	$t \leqslant 50$	$t \leqslant 75$	$t \leqslant 100$	$t \leqslant 150$	$t \leqslant 200$	$t \leqslant 250$	$t \leqslant 310$	$t \leqslant 400$
cumulative frequency	8	30	62	102	128	143	154	160

(a) Draw a cumulative frequency graph to illustrate the data. [2]



(b) Use your graph to estimate the interquartile range of the data. [2]

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3 For her morning break, Jules has a drink. She has tea, juice or water, with probabilities 0.2, 0.35 and 0.45 respectively.

When she has tea, the probability that she has a cake is 0.25.

When she has juice, the probability that she has a cake is 0.4.

When she has water, the probability that she has a cake is x.

On a randomly chosen day, the probability that Jules has a cake is 0.505.

(a) Find the value of x. [2]

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(b) Find the probability that Jules has juice given that she does not have a cake. [3]

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4 In the village of Torombo, 80% of the residents shop at the local store.

A random sample of 9 residents of Torombo is selected.

(a) Find the probability that fewer than 7 of these 9 residents shop at the local store. [3]

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A random sample of 120 residents of Torombo is selected.

(b) Use an approximation to find the probability that more than 90 of these 120 residents shop at the local store. [5]

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5 Two fair 4-sided spinners each have sides labelled 1, 2, 3, 4. The spinners are spun at the same time, and the number on the side on which each spinner lands is noted.

The random variable X is the difference between the two numbers. For example, the difference between 1 and 3 and the difference between 3 and 1 are both 2.

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

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(b) Find Var(X). [3]

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Harry spins the two fair 4-sided spinners repeatedly.

(c) Find the probability that Harry obtains a difference of 3 for the first time on his 7th spin. [1]

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(d) Find the probability that Harry obtains a difference of 3 for the third time on his 7th spin. [3]

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6 The masses of boxes of sweets of a certain brand are normally distributed with mean 420 grams and standard deviation 6.4 grams.

(a) Find the probability that a randomly chosen box of these sweets has a mass between 412 grams and 424 grams. [3]

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The masses of boxes of sweets of a second brand are normally distributed with mean 240 grams and standard deviation σ grams. In a random sample of 500 of these boxes of sweets, 42 had a mass more than 245 grams.

(b) Find the value of σ. [3]

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The masses of boxes of sweets of a third brand are normally distributed with mean μ grams and standard deviation 0.25μ grams.

(c) Find the probability that a randomly chosen box of these sweets has a mass greater than 1.2μ grams. [3]

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7 **(a)** Find the number of different arrangements of the 9 letters in the word CANADIANS in which the three As are together and the two Ns are **not** next to each other. [3]

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(b) Find the probability that a randomly chosen arrangement of the 9 letters in the word CANADIANS has exactly four letters between the two Ns. [4]

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The 9 letters in the word CANADIANS are split into a group of 4 letters, a group of 3 letters and a group of 2 letters.

(c) In how many ways can this be done if the three As are together in a group and the two Ns are together in a group? [3]

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