



Cambridge International AS & A Level

CANDIDATE
NAME



CENTRE
NUMBER

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MATHEMATICS

9709/62

Paper 6 Probability & Statistics 2

October/November 2024

1 hour 15 minutes

You must answer on the question paper.

You will need: List of formulae (MF19)

INSTRUCTIONS

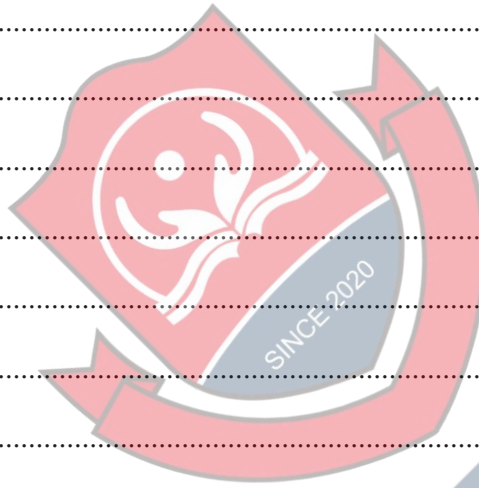
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction 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.

[3]





- (a) Find the mean length of the 50 roads in the sample. [1]

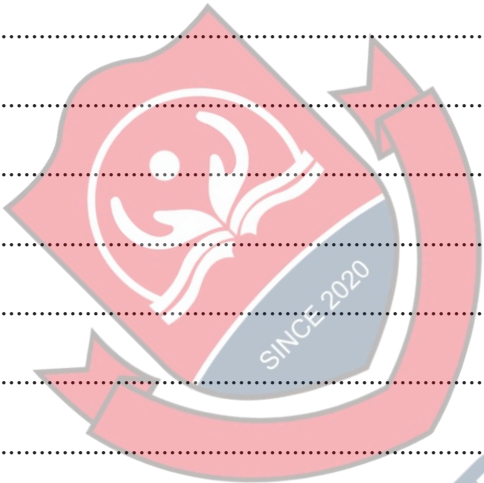
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- (b) Calculate an estimate of the standard deviation of the lengths of roads in this region. [2]



- (c) It is now given that the lengths of roads in this region are normally distributed.
- State, with a reason, whether this fact would make any difference to your calculation in part (b).
- [1]

[illegible]



- 3 A factory owner models the number of employees who use the factory canteen on any day by the distribution $B(25, p)$. In the past the value of p was 0.8 . A new menu is introduced in the canteen and the owner wants to test whether the value of p has increased.

On a randomly chosen day he notes that the number of employees who use the canteen is 23.

- (a) Use the binomial distribution to carry out the test at the 10% significance level. [5]



- (b) Given that there are 30 employees at the factory comment on the suitability of the owner's model. [1]









[3]

[3]

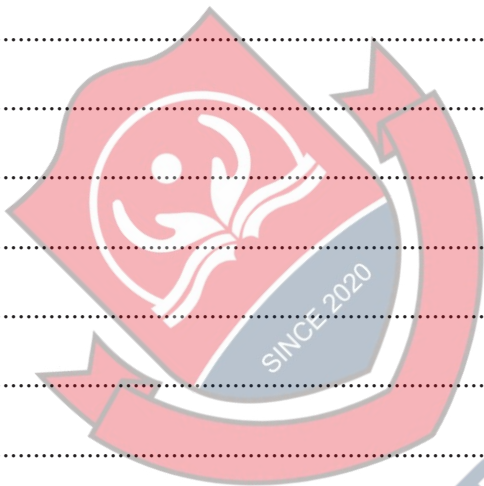
[illegible]

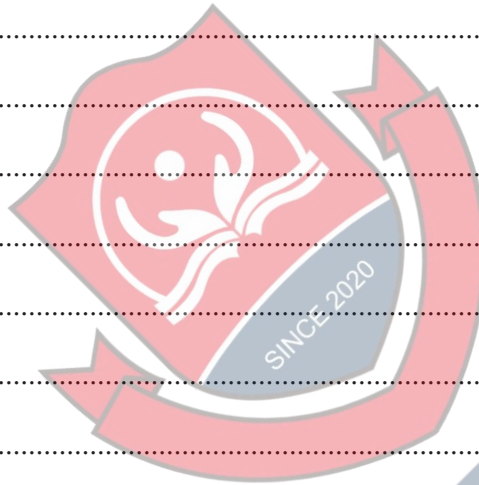
- A bag of sweets is chosen at random.

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- 4Uac



- 



- $$f(x) = \begin{cases} \frac{1}{x^2} & a \leq x \leq b, \\ 0 & \text{otherwise,} \end{cases}$$

(a) State what the constants a and b represent in this context. [1]

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(c) Show that $b = 2$ and find the value of a . [4]

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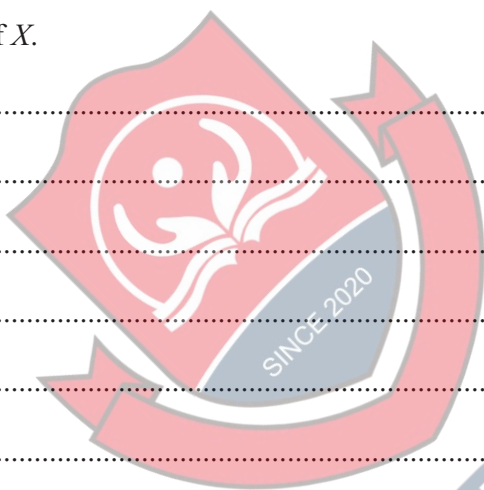
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(d) Find the median of X .

[3]



4Uadmission





- 7 The heights of one-year-old trees of a certain variety are known to have mean 2.3 m. A scientist believes that, on average, trees of this age and variety in her region are slightly taller than in other places. She plans to carry out a hypothesis test, at the 2% significance level, in order to test her belief.

(a) State the probability that she will make a Type I error.

[1]

She takes a random sample of 100 such trees in her region and measures their heights, h m. Her results are summarised below.

$$n = 100$$

$$\Sigma h = 238$$

$$\Sigma h^2 = 580$$

(b) Carry out the test at the 2% significance level.

[7]





Comment on this claim.

[1]

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