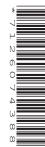


Cambridge International AS & A Level

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		



MATHEMATICS 9709/51

Paper 5 Probability & Statistics 1

May/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	A		. 1	- C	
1	A summary	01 20	values	or x	gives

$$\Sigma(x-30) = 439$$
, $\Sigma(x-30)^2 = 12405$.

A summary of another 25 values of x gives

$$\Sigma(x-30) = 470, \qquad \Sigma(x-30)^2 = 11346.$$

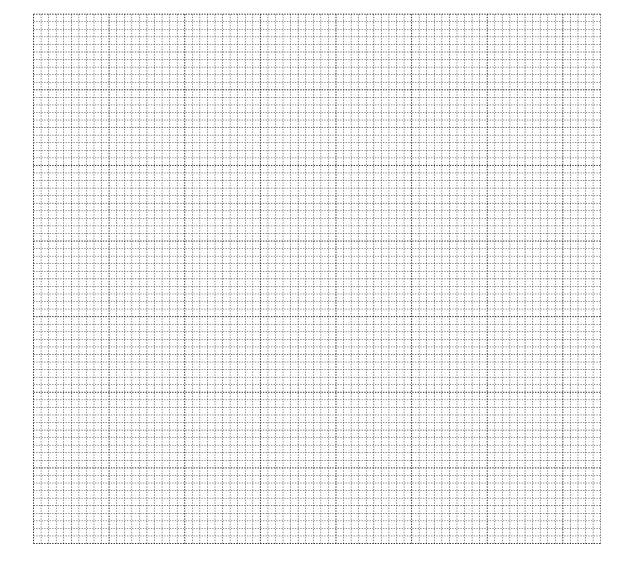
ııu	standard deviation 3.3 cm.	
a)	Find the probability that a randomly chosen adult raccoon of this species has a tail length betwee 23 cm and 35 cm.	eer [4]
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		••••
		• • • • •
	masses of adult raccoons of this species are normally distributed with mean $8.5\mathrm{kg}$ and stand in a kg. 75% of adult raccoons of this species have mass greater than $7.6\mathrm{kg}$.	arc
levi	iation σ kg. 75% of adult raccoons of this species have mass greater than 7.6 kg.	arc
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evi	iation σ kg. 75% of adult raccoons of this species have mass greater than 7.6 kg.	

3 The heights, in cm, of 200 adults in Barimba are summarised in the following table.

Height (h cm)	$130 \leqslant h < 150$	$150 \leqslant h < 160$	$160 \leqslant h < 170$	$170 \leqslant h < 175$	$175 \leqslant h < 195$
Frequency	16	32	76	64	12

(a) Draw a histogram to represent this information.

[4]



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	ner throws are made during that turn. A player who obtains a 4 in their turn scores 1 point.	
	Show that the probability that a player obtains a 4 in one turn is $\frac{37}{64}$.	[2]
		••••
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		••••
10	o and Yao play this game.	
	o and Yao play this game. Find the probability that neither Xeno nor Yao score any points in their first two turns.	[1]
		[1]
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1	Find the probability that Xeno scores 2 more points than Yao.	3]

(u)	Find the probability that in a week (7 days) it snows on at least five days.
A w	eek in which it snows on at least five days out of seven is called a 'white' week.
	eek in which it snows on at least five days out of seven is called a 'white' week. Find the probability that in three randomly chosen weeks at least one is a white week.

In a different area in the Arctic, the probability that a week is a white week is $0.8\ .$

47 are white weeks.	[5]

_	* *	1	.1	
6	Harry	has	three	coins

- One coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{3}$.
- The second coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{4}$.
- The third coin is biased so that the probability of obtaining a head when it is thrown is $\frac{1}{5}$.

Harry throws the three coins. The random variable X is the number of heads that he obtains.

Draw up the probability distribution table for X .	

Harry has two other coins, each of which is biased so that the probability of obtaining a head when it is thrown is p. He throws all five coins at the same time. The random variable Y is the number of heads that he obtains.

How many different arrangements are there of these 8 digits?	[1]
	,
Find the number of different arrangements of the 8 digits in which there is a 2 at the beginning, at the end and the three 4s are not all together.	a 2 [4]

Three digits are selected at random from the eight digits 1, 2, 2, 3, 4, 4, 4, 5.

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.		

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