



# Cambridge International AS & A Level

CANDIDATE  
NAME
CENTRE  
NUMBER

--	--	--	--	--

CANDIDATE  
NUMBER

--	--	--	--

**MATHEMATICS****9709/53**

Paper 5 Probability &amp; 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 The numbers on the faces of a fair six-sided dice are 1, 2, 2, 3, 3, 3. The random variable  $X$  is the total score when the dice is rolled twice.

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

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Find the value of  $\text{Var}(X)$ . [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN



[2]



2 In a certain country, the heights of the adult population are normally distributed with mean 1.64 m and standard deviation 0.25 m.

(a) Find the probability that an adult chosen at random from this country will have height greater than 1.93 m. [3]

[illegible]



- [illegible]



3 Box  $A$  contains 6 green balls and 3 yellow balls.

Box  $B$  contains 4 green balls and  $x$  yellow balls.

A ball is chosen at random from box  $A$  and placed in box  $B$ . A ball is then chosen at random from box  $B$ .

(a) Draw a tree diagram to represent this information, showing the probability on each of the branches. [4]

DO NOT WRITE IN THIS MARGIN





(b) Find the value of  $x$ .

[3]

[illegible]



- 4 The times taken, in seconds, by 15 members of each of two swimming clubs, the Penguins and the Dolphins, to swim 50 metres are shown in the following table.

Penguins	35	39	42	44	45	45	48	50	56	58	59	61	66	68	72
Dolphins	36	41	43	48	49	49	50	51	54	56	56	60	61	64	71

- (a) Draw a back-to-back stem-and-leaf diagram to represent this information, with Penguins on the left-hand side. [4]

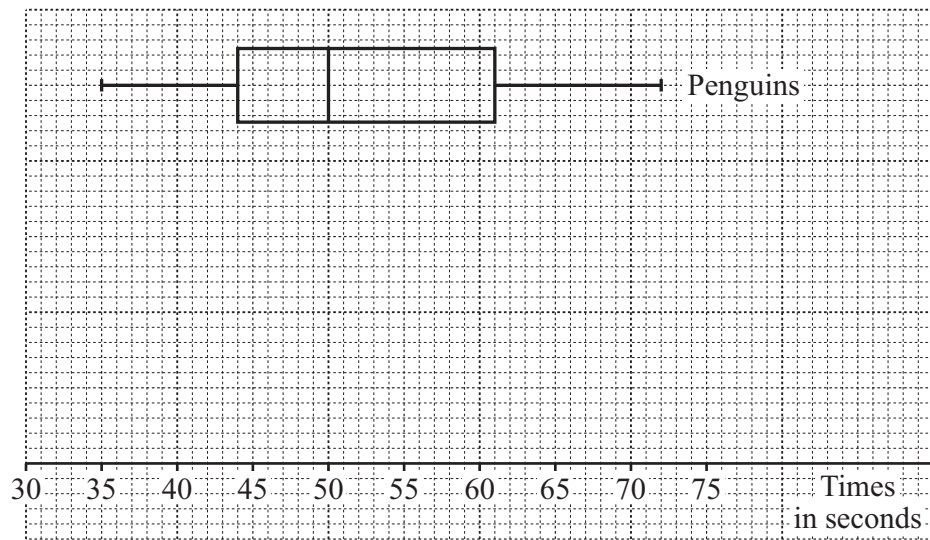






The diagram shows a box-and-whisker plot representing the times for the Penguins.

- (b)** On the same diagram, draw a box-and-whisker plot to represent the times for the Dolphins. [3]



- (c) Hence state **one** difference between the distributions of the times for the Penguins and the Dolphins. [1]

[illegible]



5 Salah decides to attempt the crossword puzzle in his newspaper each day. The probability that he will complete the puzzle on any given day is 0.65, independent of other days.

**(a)** Find the probability that Salah completes the puzzle for the first time on the 5th day. [1]

.....

.....

.....

.....

**(b)** Find the probability that Salah completes the puzzle for the second time on the 5th day. [2]

[illegible]

(c) Find the probability that Salah completes the puzzle fewer than 5 times in a week (7 days). [3]

[illegible]



1

[illegible]

---

---

---

---

---

---

This image shows a full page of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.



\_\_\_\_\_

- 
- This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

\* 0019654999515 \*



15

BLANK PAGE



DO NOT WRITE IN THIS MARGIN





Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cambridgeinternational.org](http://www.cambridgeinternational.org) after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

