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Newlighthouse Mock AS & A Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **9709/52**

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 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. Any blank pages are indicated.

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1 The discrete random variable X takes the values $-1, 1, 2, 3, 4$ with probabilities as shown in the table, where p and q are constants.

x	-1	1	2	3	4
$\mathrm{P}(X = x)$	0.15	p	0.2	q	0.1

(a) Given that $\mathrm{E}(X) = 1.75$, find the value of p and the value of q. [3]

(b) Find $\mathrm{P}(X > 1 \mid X \neq 4)$. [2]

2 Bag A contains 5 red marbles and 3 blue marbles. Bag B contains 4 red marbles and 2 blue marbles.

A marble is chosen at random from Bag A and placed in Bag B. A marble is then chosen at random from Bag B.

(a) Draw a fully labelled tree diagram to represent this information, showing all the probabilities. [2]

(b) Find the probability that the two marbles chosen are the same colour. [2]

(c) Find the probability that the marble chosen from Bag A was blue, given that the marble chosen from Bag B is red. [3]

3 The back-to-back stem-and-leaf diagram shows the masses, in kg, of 25 male dogs and 25 female dogs of a certain breed.

Male dogs		Female dogs
	18	4 7 9
(3) 8 5 2	19	1 3 6 8 (4)
(5) 9 7 4 3 0	20	0 2 2 5 7 9 (6)
(7) 9 8 8 5 4 2 1	21	1 3 4 8 (4)
(6) 7 6 5 2 2 0	22	0 2 5 5 9 (5)
(4) 8 6 3 1	23	3 7 8 (3)

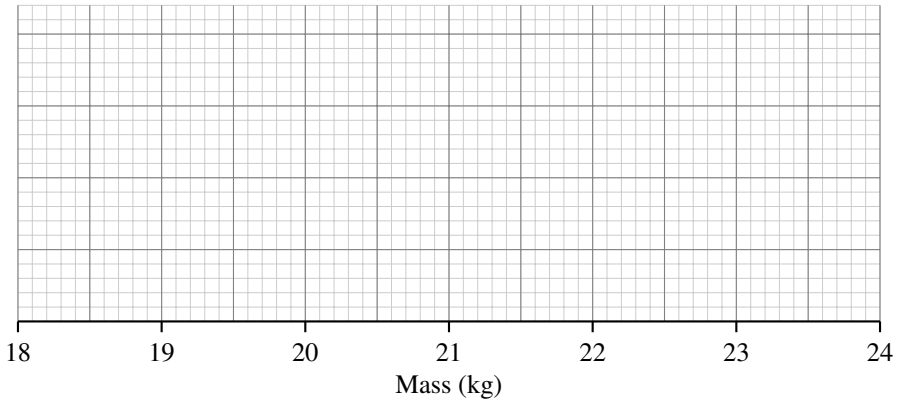
Key: 2 | 19 | 1 means 19.2 kg for Male dogs and 19.1 kg for Female dogs.

(a) Find the median and the interquartile range of the masses of the male dogs. [3]

. . . . . .

(b) For the female dogs, the lower quartile of the masses is 19.7 kg, the median is 20.9 kg and the upper quartile is 22.4 kg.

On the grid below, draw a box-and-whisker plot to represent the information for **both** the male dogs and the female dogs. [3]



(c) Make one comparison between the masses of the male dogs and the masses of the female dogs. [1]

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4 The word METEORITE contains 9 letters.

(a) Find the number of different arrangements of the 9 letters in which there are exactly 3 letters between the two Ts. [3]

(b) Find the probability that a randomly chosen arrangement of the 9 letters has the three Es together, but the two Ts are **not** next to each other. [4]

5 A fair 6-sided die is thrown repeatedly.

(a) Find the probability that a 5 or a 6 is obtained for the second time on the 7th throw. [3]

(b) Find the probability that fewer than 6 throws are required to obtain a 5 or a 6 for the second time. [3]

6 The time taken, t minutes, by 120 students to complete a test is recorded. The results are summarised by

$$\sum(t-40) = 264 \qquad \text{and} \qquad \sum(t-40)^2 = 3456$$

(a) Calculate the mean and variance of the times taken by the 120 students. [2]

(b) The times taken by the students are found to be normally distributed. Use your values from part **(a)** to find the probability that a randomly chosen student took more than 45 minutes to complete the test. [3]

(c) In another school, the probability that a student takes more than 45 minutes to complete the test is 0.32. Use a suitable approximation to find the probability that out of 100 randomly chosen students, fewer than 30 take more than 45 minutes. [5]

7 A robotics club has 12 members, consisting of 6 senior students and 6 junior students.

(a) For a weekend workshop, a group of 5 members is chosen at random.
Find the probability that the group contains more junior students than senior students. [3]

(b) For a regional competition, the club divides all 12 members into 3 teams of 4 members each. Each team will compete in a different category: Design, Programming, and Strategy.
In how many different ways can the teams be assigned if there are no restrictions? [2]

(c) In how many different ways can the teams be assigned if one team consists entirely of senior students and another team consists entirely of junior students? [3]

Additional page

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

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