AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE STATISTICS

F

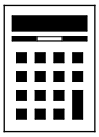
Foundation Tier Paper 1

Wednesday 5 June 2024 Afternoon Time allowed: 1 hour 45 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross out any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

For Examiner's Use	
Question	Mark
1–4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
TOTAL	

Answer **all** questions in the spaces provided.

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1 Work out the range of these values.

3 6 6 6 8 9 11 15

Circle your answer below.

[1 mark]

6 7 8 12

2 Circle the percentage that **cannot** be a probability.

[1 mark]

0.01% 110% 10% 100%

3 Which of these is **not** a source of data?

Circle your answer.

[1 mark]

Observation Simulation Census Stratification

4 Spearman's rank correlation coefficients are calculated for four data sets.
Which of these values represents a **weak**, **negative** correlation?

Circle your answer.

[1 mark]

−1 0.02 −0.9 −0.4

4

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5 There are 12 discs in a box.

Colour	Blue	Red	Green	White
Number of discs	2	3	3	4

A disc is picked at random from the box.

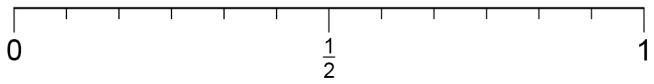
5 (a) Which two colours have the **same** probability of being picked?

[1 mark]

Answer _____ and _____

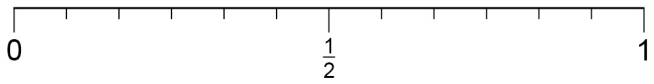
5 (b) On the probability scale below, draw an arrow to mark the probability that the disc is blue.

[1 mark]



5 (c) On the probability scale below, draw an arrow to mark the probability that the disc is pink.

[1 mark]



5 (d) A **different** box contains discs that are 5 different colours.

Kim says,

"There are 5 different colours in the box.
The probability of picking each colour must be $\frac{1}{5}$"

Give a reason why she **may not** be correct.

[1 mark]

_____

_____

4

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6 Ben records the numbers of cars and lorries passing his house for the same hour each day for one week in June.

	Number of cars	Number of lorries
Monday	5	17
Tuesday	8	12
Wednesday	12	17
Thursday	10	16
Friday	7	16
Saturday	23	8
Sunday	19	10

6 (a) Write down the number of cars Ben records on Friday.

[1 mark]

Answer _____

6 (b) Write down the day Ben records 5 more lorries than cars.

[1 mark]

_____

_____

Answer _____

6 (c) How many cars and lorries did Ben record, in total, on Saturday and Sunday?

[2 marks]

_____

_____

Answer _____

Do not write outside the box

6 (d) Work out the fraction of the vehicles he records on Tuesday that are cars.

[2 marks]

Answer _____

6 (e) Compare the number of **cars** recorded that Monday with those recorded that Saturday.

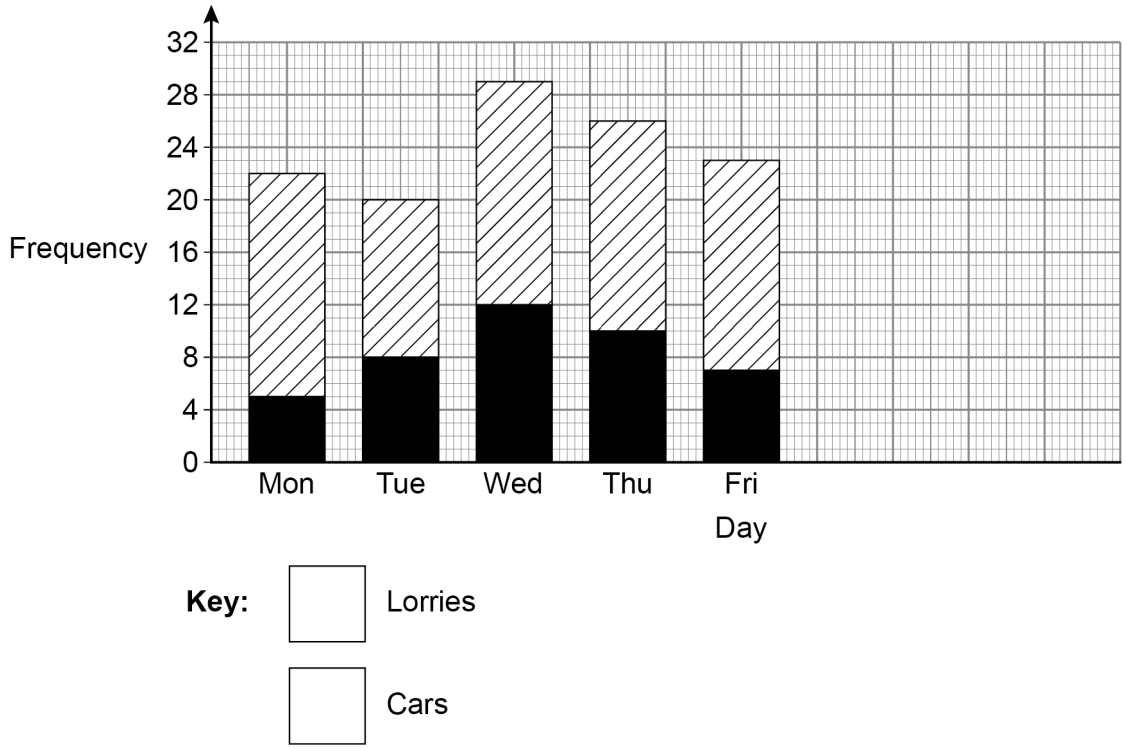
[1 mark]

Question 6 continues on the next page

Here is the table again.

	Number of cars	Number of lorries
Monday	5	17
Tuesday	8	12
Wednesday	12	17
Thursday	10	16
Friday	7	16
Saturday	23	8
Sunday	19	10

The composite bar chart represents the first five days for Ben's data.



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6 (f) Complete the composite bar chart, including the key.

[5 marks]

6 (g) Ben says,

"My data tell me how many cars will be using the road in **December**."

Give two reasons why Ben might **not** be correct.

[2 marks]

1 _____

_____

_____

2 _____

_____

_____

14

Turn over for the next question

Do not write outside the box

7 Tia is studying the population of Brazil.

7 (a) She finds some information and rounds the values to the nearest 5 million.
Her results are shown in the table.

Year	Population (millions)
1980	120
1990	150
2000	175
2010	195
2020	215

Source: populationpyramid.net

7 (a) (i) Write down **one** advantage of rounding the population figures.

[1 mark]

7 (a) (ii) Write down **one** disadvantage of rounding the population figures.

[1 mark]

7 (b) Briefly describe the trend in the population of Brazil from 1980 to 2020.

Tick (✓) a box.

[1 mark]

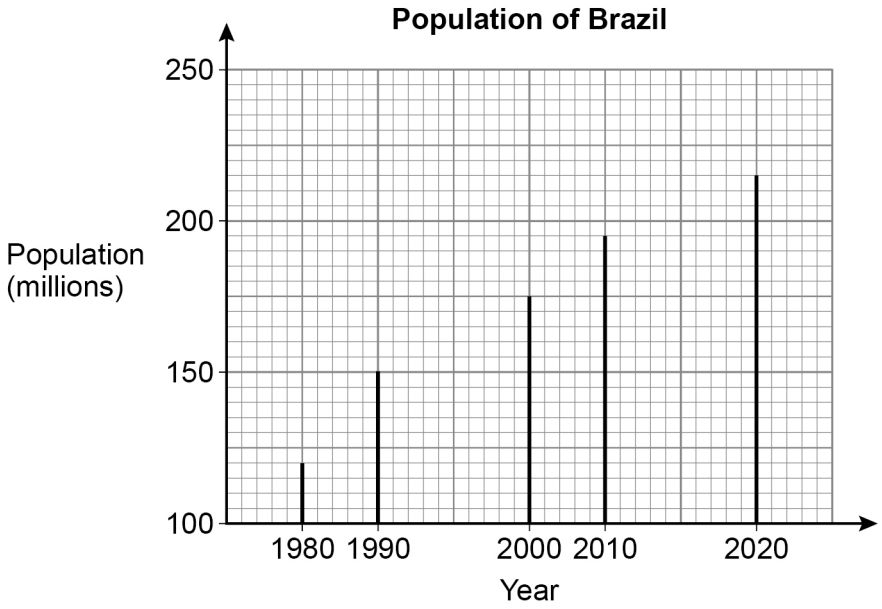
The population is increasing. ☐

The population is decreasing. ☐

The population stays the same. ☐

Do not write outside the box

7 (c) (i) Tia used the information to draw this vertical line graph.



Write down **two** criticisms of the vertical line graph.

[2 marks]

Criticism 1 _____

_____

_____

Criticism 2 _____

_____

_____

Question 7 continues on the next page

Do not write outside the box

7 (c) (ii) Tia wants to estimate the population in Brazil in 2005.

Are the data suitable for this estimation?

Tick (✓) a box.

☐ Yes ☐ No

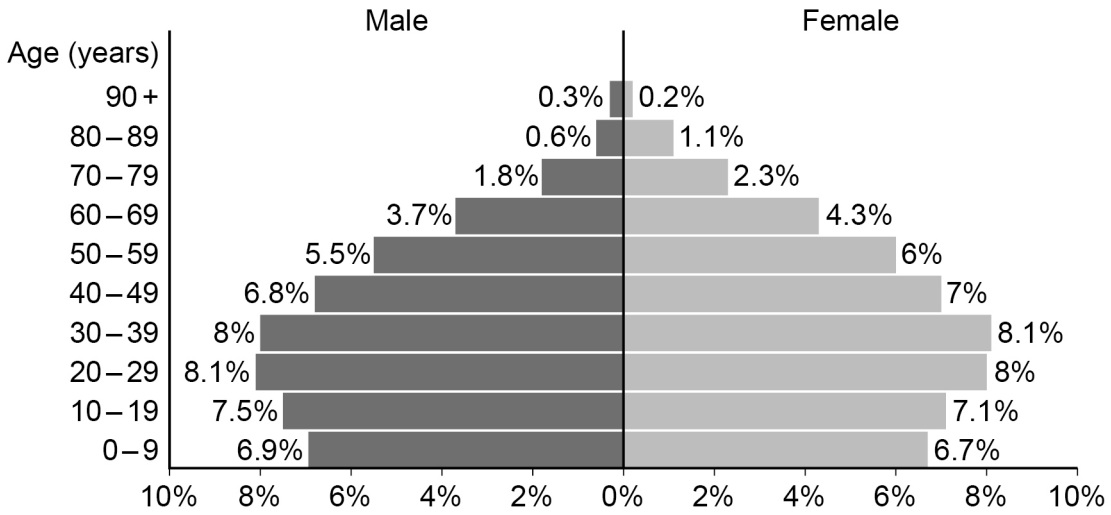
Give a reason for your answer.

[1 mark]

_____

_____

7 (d) The population pyramid shows information about the ages of people in Brazil in 2020.



Source: Adapted from populationpyramid.net

7 (d) (i) In 2020, what percentage of the population of Brazil was female aged 50–59?

[1 mark]

Answer _____ %

Do not write outside the box

7 (d) (ii) In 2020, which age group in Brazil had the **greatest** percentage of males?

[1 mark]

Answer _____

7 (d) (iii) Tia says,

"There are **more** males than females aged 60 and over."

Does the population pyramid support this statement?

Tick (✓) a box.

☐ Yes ☐ No

Give a reason for your answer.

[2 marks]

_____

_____

_____

10

Turn over for the next question

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8 Xander and Leah want to investigate the time it takes students to complete a course.

They each decide to collect their own sample of students.

8 (a) The table shows information about Xander's data.

Time, t (hours)	**Frequency**
$0 < t \leqslant 10$	2
$10 < t \leqslant 20$	12
$20 < t \leqslant 30$	9
$30 < t \leqslant 40$	7
$40 < t \leqslant 50$	3
$50 < t \leqslant 60$	1
	Total = 34

8 (a) (i) How many students in Xander's sample took more than 40 hours to complete the course?

[1 mark]

Answer _____

8 (a) (ii) Which class interval contains the median for Xander's data?

Circle your answer below.

[1 mark]

$0 < t \leqslant 10$ $10 < t \leqslant 20$ $20 < t \leqslant 30$ $30 < t \leqslant 40$

Do not write outside the box

8 (b) Leah rounds the times for her sample of 34 students to the nearest hour.

The stem-and-leaf diagram shows the data.

0	8 9
1	2 2 6 7 8
2	2 4 5 5 7 8 9 9
3	0 1 2 4 4 6 7 7 8 9 9
4	0 1 2 5 5
5	1 2 4

Key: 1 | 2 = 12 hours

Write down the number of students who took more than 44 hours.

[1 mark]

3

Answer _____

Turn over for the next question

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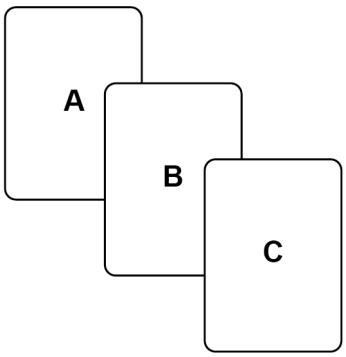
9 Jem has designed a game to raise money for charity.

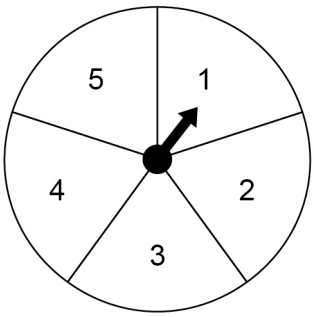
To play the game

you turn over, at random, one of three cards labelled A, B and C

and

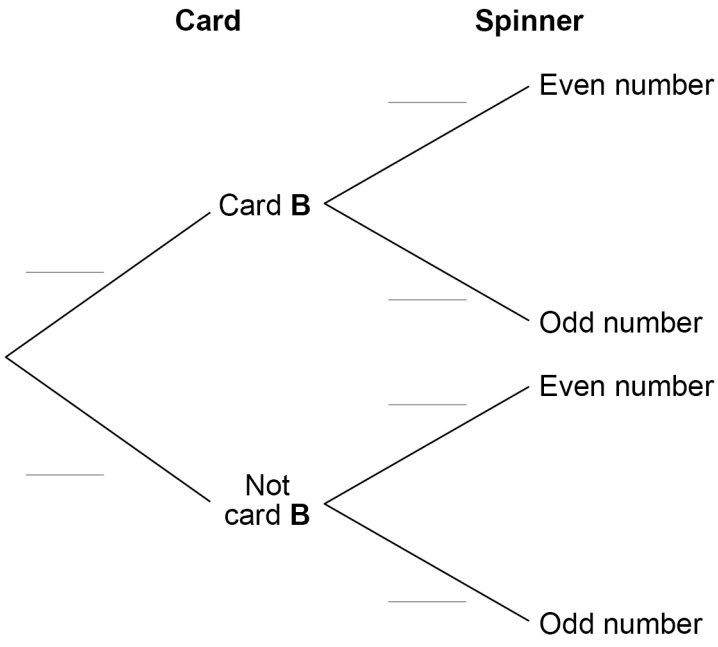
you spin a fair spinner numbered 1 to 5





9 (a) The tree diagram shows some of the probabilities.

Complete the tree diagram.



[2 marks]

Do not write outside the box

9 (b) (i) Jem plays the game.

Calculate the probability that he picks card B **and** spins an even number.

[2 marks]

Answer _____

9 (b) (ii) Each player will pay £2 to play the game.

They win £4 if they pick card B **and** spin an even number.

300 people play the game.

Use your answer to part **(b)(i)** to work out how much money Jem should expect to raise.

[3 marks]

Answer £_____

7

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10 Jesse looks online at how the cost to send a 100g standard letter in the UK has changed.

The table shows the data found.

Year	Cost of a 2nd class stamp	Cost of a 1st class stamp
2000	19p	27p
2005	21p	30p
2010	32p	41p
2015	54p	63p
2020	65p	76p

Source: gbps.org.uk

10 (a) Tick (✓) to show if each statement is true or false.

[3 marks]

	True	**False**
The data in the table are primary data.	☐	☐
The data in the table are quantitative data.	☐	☐
The data in the table are continuous data.	☐	☐

Question 10 continues on the next page

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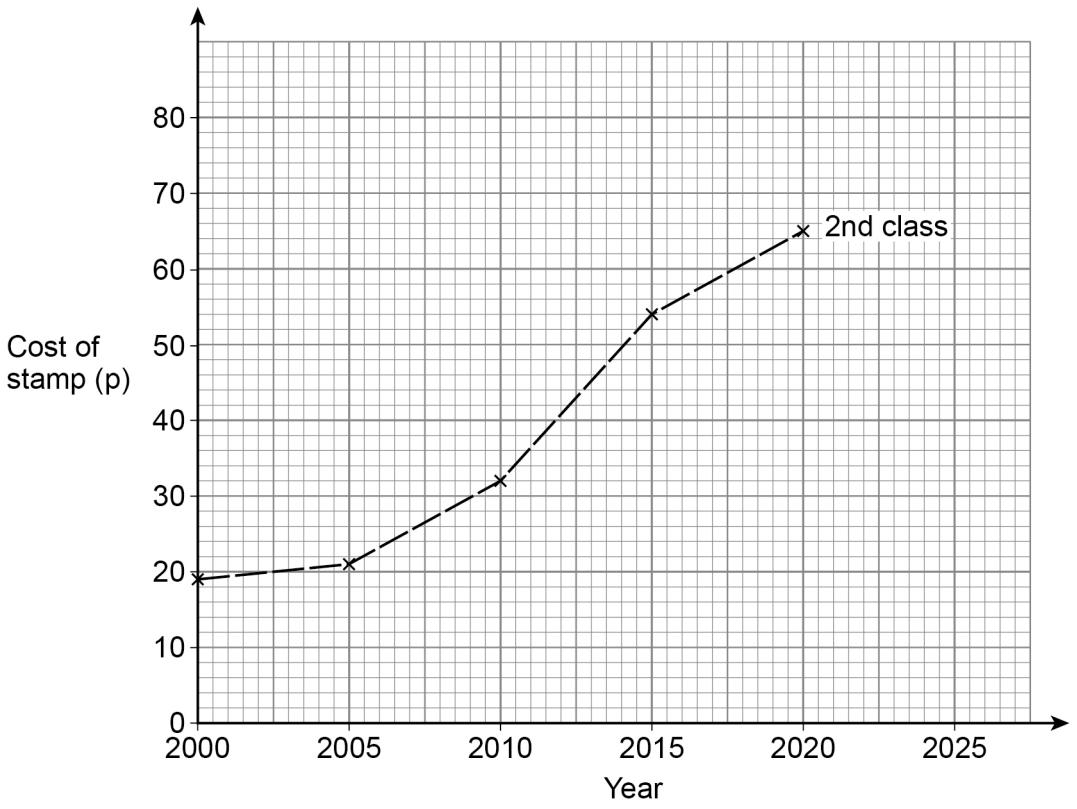
Here is the table again.

Year	Cost of a 2nd class stamp	Cost of a 1st class stamp
2000	19p	27p
2005	21p	30p
2010	32p	41p
2015	54p	63p
2020	65p	76p

Source: gbps.org.uk

Jesse has drawn a time series graph to show the cost of a 2nd class stamp.



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10 (b) During which five-year period did the cost of a **2nd class** stamp increase the most?

Tick (✓) a box.

2000 to 2005	☐	2005 to 2010	☐
2010 to 2015	☐	2015 to 2020	☐

How can you see this on the time series graph?

[2 marks]

10 (c) Draw a time series graph to show the cost of a **1st class** stamp from 2000 to 2020 on the same grid.

[3 marks]

10 (d) Jesse works out to the nearest 1% that,

from 2000 to 2020 the cost of a 1st class stamp has increased by 181%

Show that the cost of a 2nd class stamp has increased by a **greater** percentage.

[2 marks]

10

Turn over for the next question

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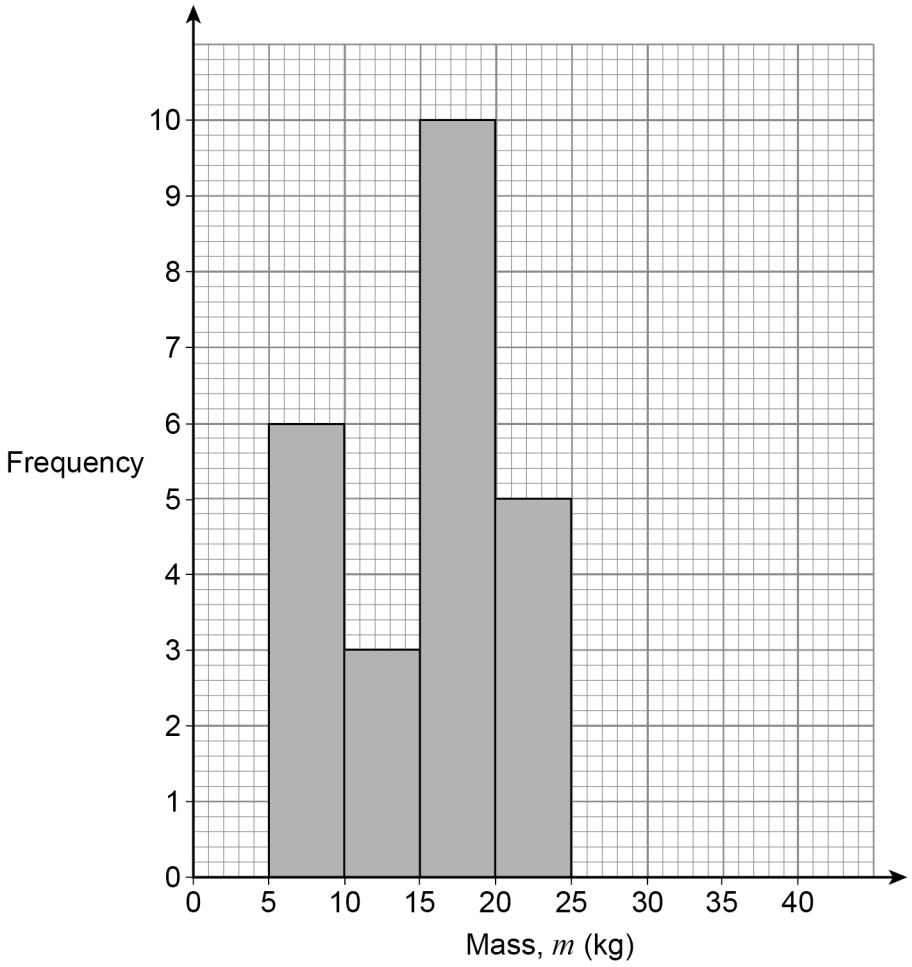
11 Tom has a dog-walking business.

The equal-width histogram represents the masses of the dogs he walks on Monday.



11 (a) Complete the grouped frequency table for these dogs.

[2 marks]

Mass, m (kg)	**Frequency**
$5 \leqslant m < 10$	6
	3
$15 \leqslant m < 20$	

Do not write outside the box

11 (b) Tom says,

"One of these dogs has a mass of 5 kg."

Give one reason why Tom might **not** be correct.

[1 mark]

11 (c) Calculate the percentage of these dogs that have a mass less than 15 kg.

[2 marks]

Answer _____ %

Question 11 continues on the next page

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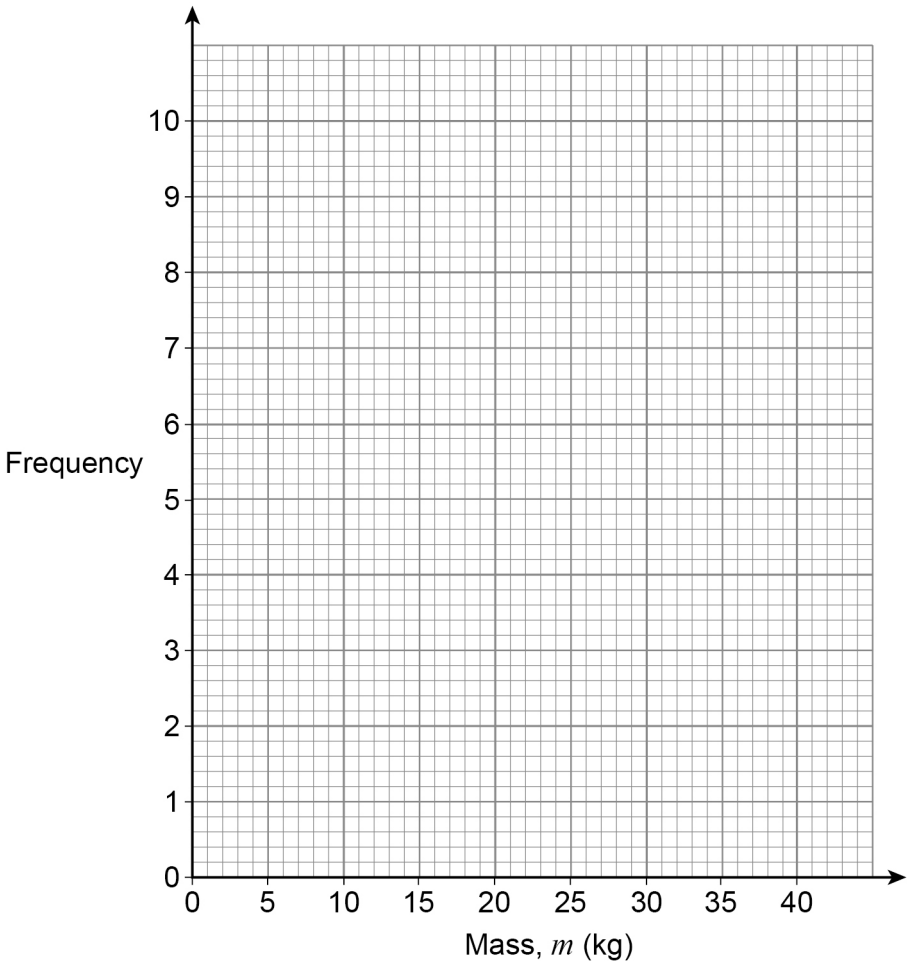
11 (d) This table shows information about the masses of the dogs Tom walks on Tuesday.

Mass, m (kg)	**Frequency**
$0 \leqslant m < 10$	7
$10 \leqslant m < 20$	8
$20 \leqslant m < 30$	5
$30 \leqslant m < 40$	1

Draw an equal-width histogram for this information.

[2 marks]



7

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Turn over for the next question

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12 Alex asks a group of friends how many times they exercised last month.

Here are the data.

0 0 1 2 3 6 7 8 29 30

12 (a) Complete the table for the data.

[2 marks]

Mode	
Median	4.5
Mean	

12 (b) (i) Is the mode suitable to represent the data?

Tick (✓) a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

Do not write outside the box

12 (b) (ii) Is the median suitable to represent the data?

Tick (✓) a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

12 (b) (iii) Is the mean suitable to represent the data?

Tick (✓) a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

5

Turn over for the next question

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13 All Year 7 students in two schools take the same French test.

Sanjit wants to know if students in school A or school B score better.

13 (a) Write down a suitable hypothesis that Sanjit could use.

[1 mark]

13 (b) Describe fully the population for Sanjit's investigation.

[1 mark]

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13 (c) Sanjit considers the following two methods for collecting scores from a sample of 19 students in school A.

Method A

Ask the first 19 Year 7 students who arrive in the playground.

Method B

Give each student in Year 7 a unique number.

Generate 19 different random numbers.

Use the 19 students whose numbers match the ones generated.

State the name of each method and give one advantage of that method.

[4 marks]

Method A

Name _____

Advantage _____

_____

Method B

Name _____

Advantage _____

_____

Question 13 continues on the next page

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13 (d) Sanjit collects the test scores from a sample of 19 Year 7 students in **school A**.

Here are his data.

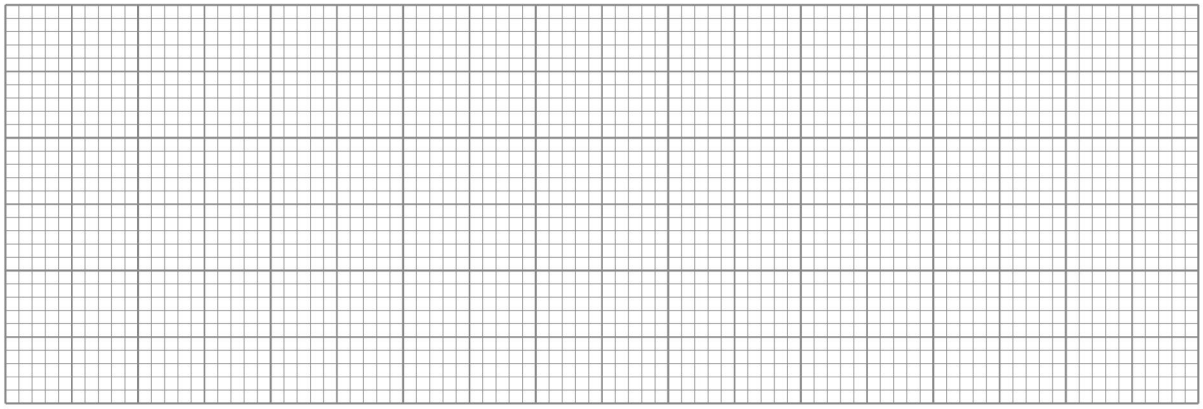
5	8	9	9	10	11	13	14	14	15
18	19	23	24	26	31	35	37	42	

Draw a box plot to represent these data.

You may use the table to help.

[6 marks]

Lower Quartile	
Median	
Upper Quartile	



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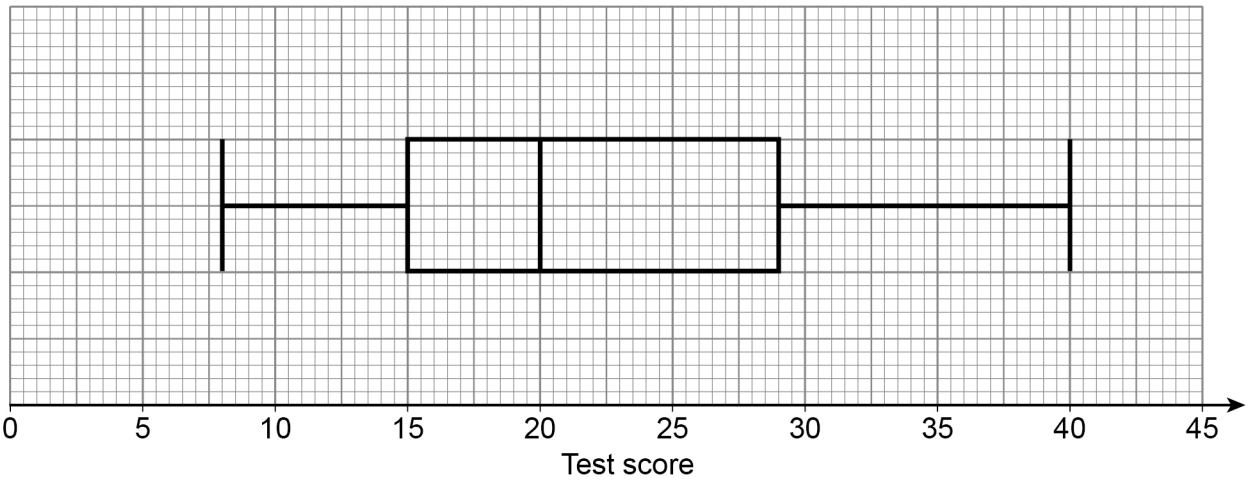
Sanjit draws this box plot to show the test scores for his sample of 19 students from **school B**.



13 (e) (i) Use the box plot to write down the median test score for **school B**.

[1 mark]

Answer _____

13 (e) (ii) Compare statistically the median scores for **school A** and **school B**.

[1 mark]

_____

_____

_____

13 (f) (i) Use the box plot to calculate the interquartile range for **school B**.

[1 mark]

_____

_____

Answer _____

13 (f) (ii) Compare statistically the interquartile ranges for **school A** and **school B**.

[1 mark]

_____

_____

_____

16

END OF QUESTIONS

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