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| Centre Number | | | | | | Candidate Number | | | | |
| Surname | | | | | | | | | | |
| Other Names | | | | | | | | | | |
| Candidate Signature | | | | | | | | | | |

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|---------------------|------|
| For Examiner's Use | |
| Examiner's Initials | |
| Pages | Mark |
| 2 – 3 | |
| 4 – 5 | |
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| 10 – 11 | |
| 12 – 13 | |
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| 18 – 19 | |
| TOTAL | |



General Certificate of Secondary Education
Higher Tier
November 2013

Mathematics

43601H

Unit 1

Wednesday 6 November 2013 9.00 am to 10.00 am

H

For this paper you must have:

- a calculator
- mathematical instruments.



Time allowed

- 1 hour

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.
- Do all rough work in this book.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 54.
- The quality of your written communication is specifically assessed in Questions 9 and 11. These questions are indicated with an asterisk (*).
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.



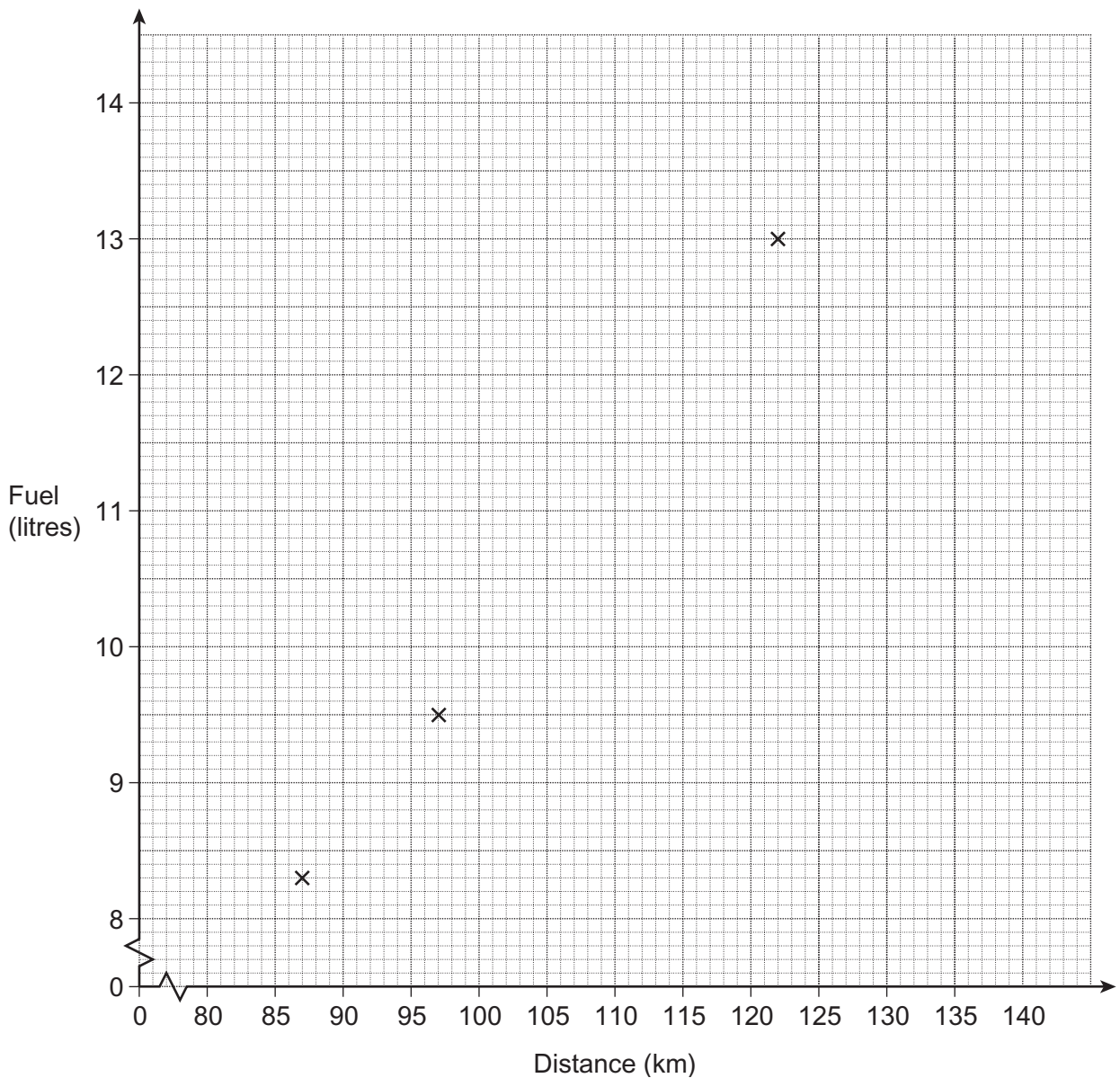
N 0 V 1 3 4 3 6 0 1 H 0 1

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

- 1 Each day a taxi driver records the distance he travels.
He also records the amount of fuel his car uses.

| | | | | | | | | |
|----------------------|-----|------|-----|-----|------|-----|------|------|
| Distance (km) | 87 | 122 | 97 | 90 | 105 | 100 | 135 | 116 |
| Fuel (litres) | 8.3 | 13.0 | 9.5 | 9.4 | 11.2 | 9.9 | 14.0 | 12.0 |

- 1 (a) Complete the scatter graph.
The first three points have already been plotted.



(2 marks)



1 (b) Draw a line of best fit. (1 mark)

1 (c) Use your line of best fit to predict the fuel used to travel 110 km.
.....

Answer litres (1 mark)

Turn over for the next question



2 Here is some information about 50 houses.

| Number of bedrooms | Number of houses |
|--------------------|------------------|
| 1 | 6 |
| 2 | 10 |
| 3 | 22 |
| 4 | 9 |
| 5 | 3 |
| Total = 50 | |

Show that the mean number of bedrooms is less than 3.

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(3 marks)



- 3** Jake works in a bookshop.
People can pay by cash, card or token.
- He wants to know if men and women pay in different ways.
- Design an observation sheet for him.

(2 marks)

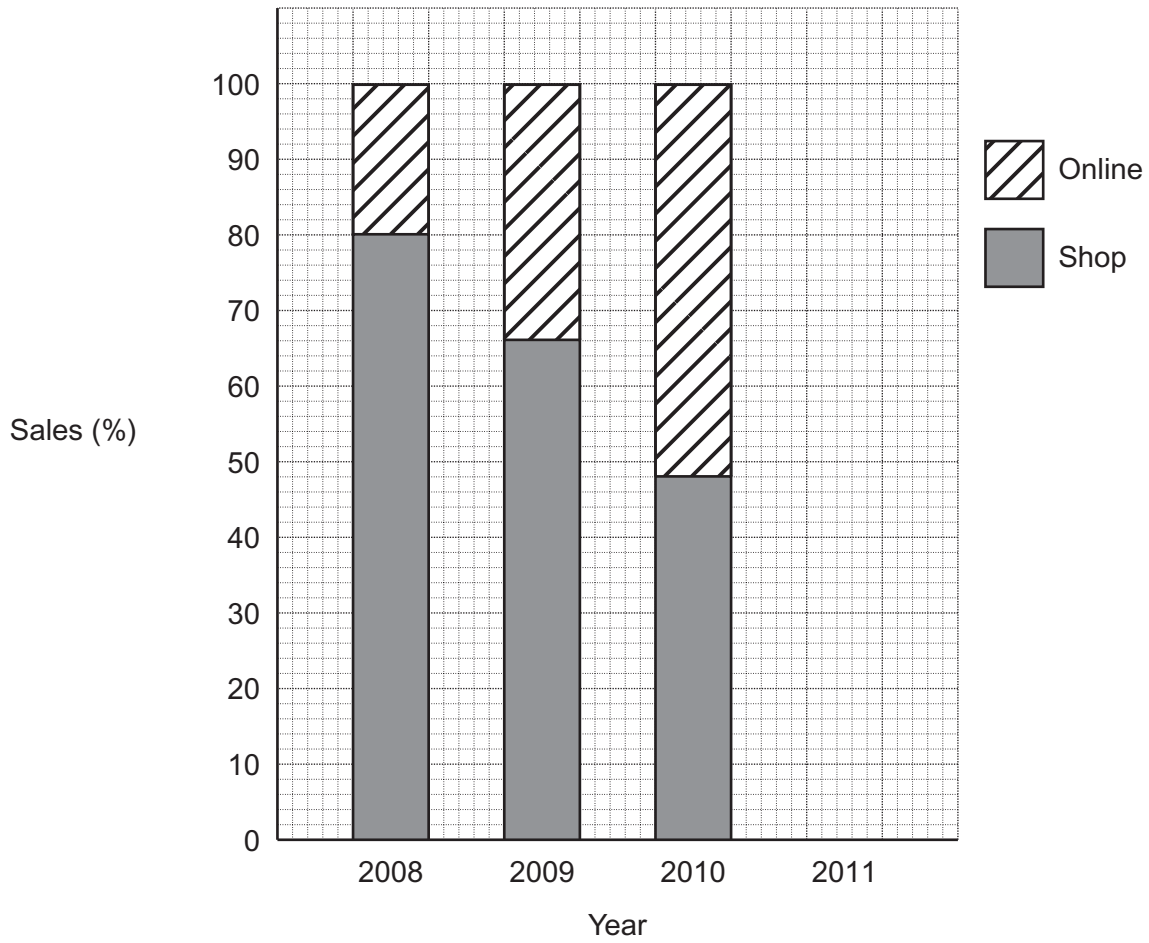
Turn over for the next question

5

Turn over ►



4 A company sells items online and in a shop. This chart shows information about its sales.



4 (a) The table shows the sales for 2011.

| | Sales (£ thousands) |
|--------------|---------------------|
| Online | 152 |
| Shop | 48 |
| Total | 200 |

Show the information for 2011 sales on the chart.

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(3 marks)



- 4 (b) Work out the ratio of online sales to shop sales for **2008**.
Give your answer in its simplest form.

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Answer : (2 marks)

- 4 (c) In 2012 online sales : shop sales = 3 : 1
What **fraction** of the 2012 sales were online?

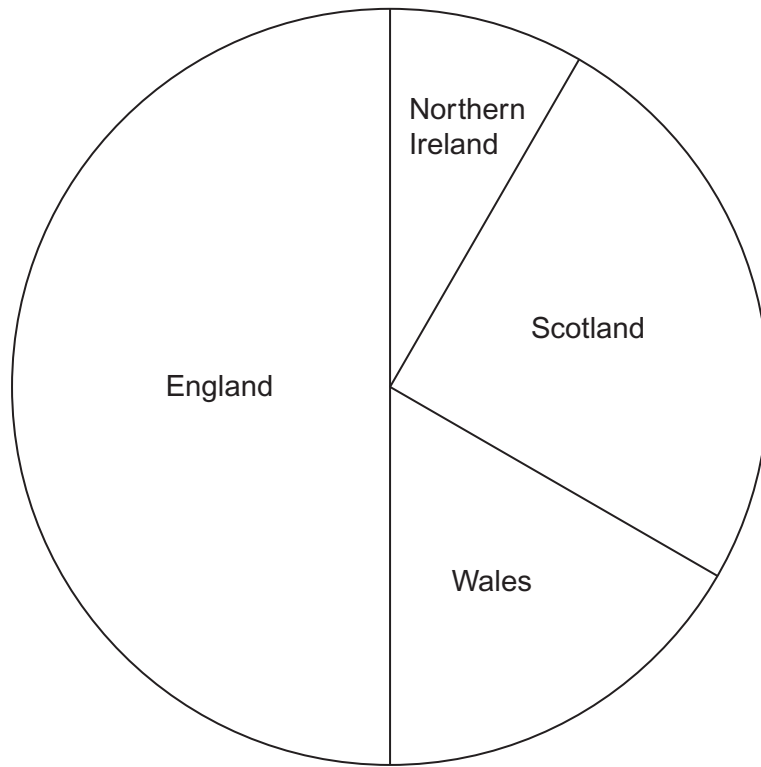
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Answer (1 mark)

Turn over for the next question



5 The pie chart shows information about the number of magazines sold in four countries.



30 000 magazines were sold in Wales.

How many magazines were sold in total?

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Answer (3 marks)



6 Amina asks 50 people,

“What is your favourite pet?
Choose from cat, dog, rabbit or other.”

6 (a) Which **two** words describe the type of data she collects from each person?
Circle your answers.

qualitative

continuous

primary

secondary

(1 mark)

6 (b) Which **two** diagrams could she use to represent the data?
Circle your answers.

scatter graph

pie chart

bar chart

stem-and-leaf

(1 mark)

Turn over for the next question



7 In a survey people had to choose A, B, C or D.
The percentages for B, C and D are shown.

| A | B | C | D |
|---|-----|-----|-----|
| | 25% | 35% | 30% |

150 people chose B.

How many people chose A?

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Answer (4 marks)



8 David invests £5000 in a savings account.
The account pays 3.2% compound interest per year.

Work out the value of his investment after 3 years.
Give your answer to the nearest penny.

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Answer £ (4 marks)

Turn over for the next question

8

Turn over ►



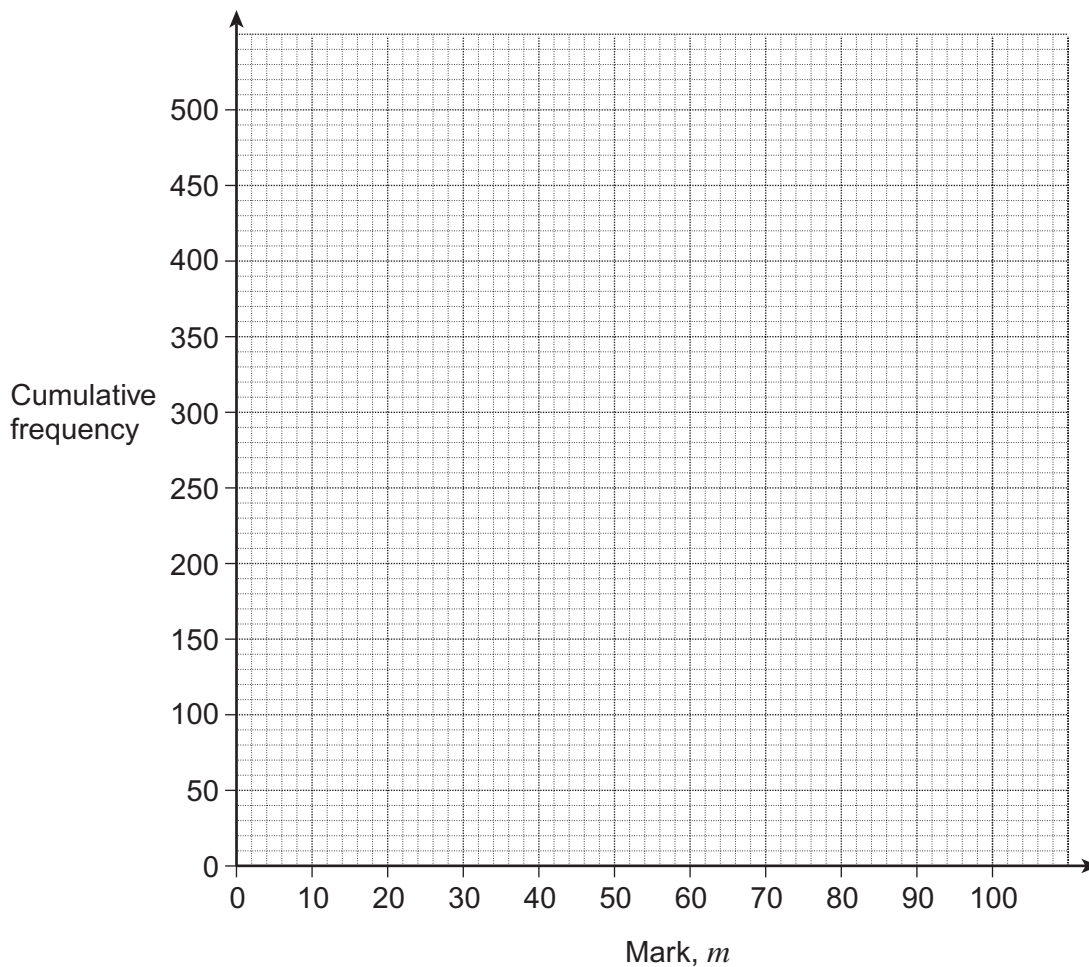
- 9 The table shows information about the marks of 500 students.

| Mark, m | Frequency | Cumulative frequency |
|-------------------|-----------|----------------------|
| $15 < m \leq 40$ | 80 | 80 |
| $40 < m \leq 60$ | 220 | |
| $60 < m \leq 80$ | 125 | |
| $80 < m \leq 100$ | 75 | |

- 9 (a) Complete the cumulative frequency column.

(1 mark)

- *9 (b) Show the information on a cumulative frequency graph.



(3 marks)



9 (c) The top 10% of the students are awarded a distinction.

Estimate the mark needed for a distinction.

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Answer (2 marks)

Turn over for the next question

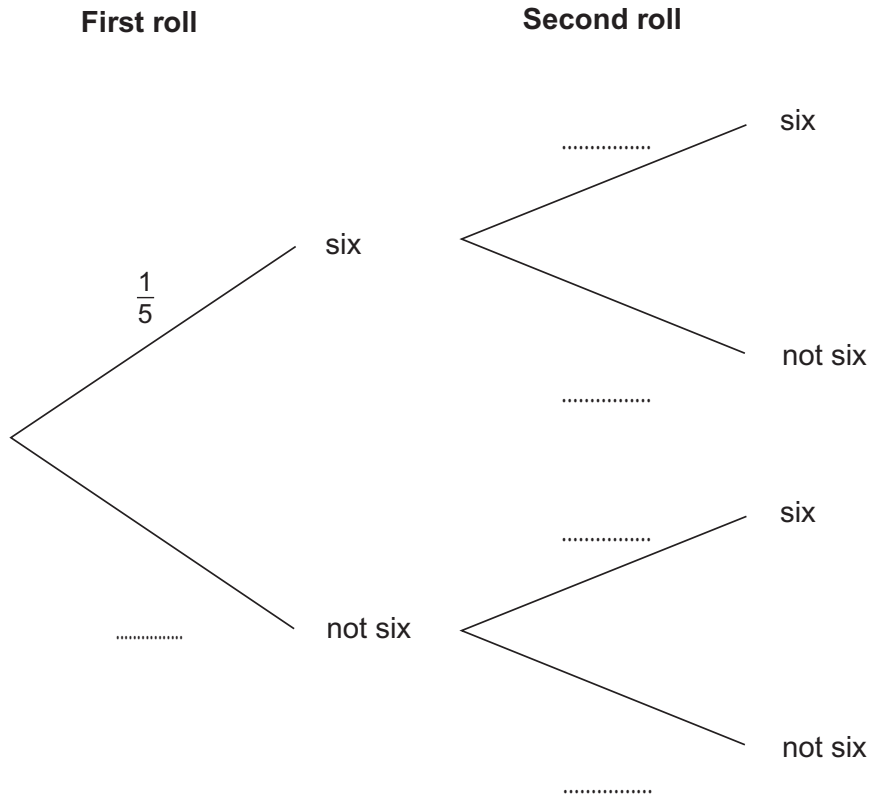
| |
|---|
| 6 |
|---|

Turn over ►



10 The probability of rolling a six on a biased dice is $\frac{1}{5}$
The dice is rolled twice.

10 (a) Complete the tree diagram.



(2 marks)

10 (b) Work out the probability of rolling exactly one six.

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Answer (2 marks)



***11** Here is a list of numbers.

1 000 000

4.6×10^4

63 000

5×10^3

1.7×10^5

Work out the range.
Write your answer in standard form.

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Answer (4 marks)

Turn over for the next question

8

Turn over ►



12 240 people visited a museum.
The cumulative frequency table shows information about their ages.

| Age (years) | Cumulative frequency |
|-------------|----------------------|
| ≤ 4 | 0 |
| ≤ 12 | 65 |
| ≤ 19 | 175 |
| ≤ 64 | 215 |
| ≤ 80 | 240 |

12 (a) The museum has four types of ticket.

| | | | | |
|--------------------|---------|----------|----------|-------------|
| Ticket type | Child | Teenager | Adult | Senior |
| Age (years) | 5 to 12 | 13 to 19 | 20 to 64 | 65 and over |

Show that 110 teenagers visited the museum.

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 (1 mark)

12 (b) The owner wants a sample of size 30, stratified by ticket type.

How many teenagers should be in the sample?

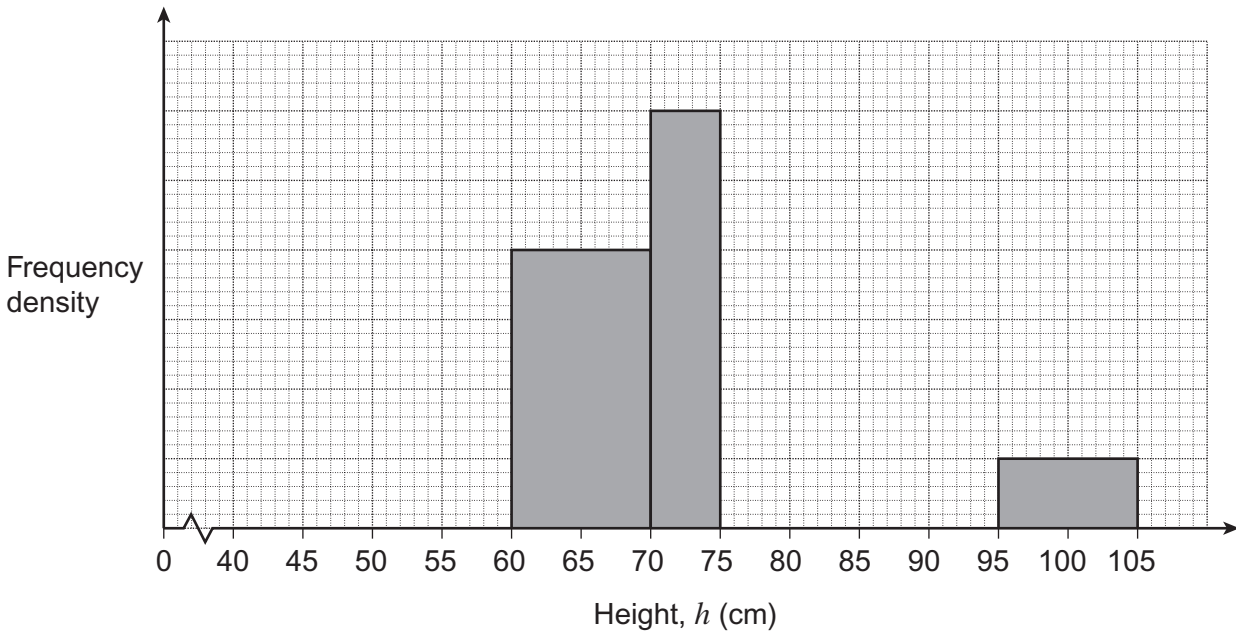
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Answer (3 marks)



13 The table and histogram give some information about the heights of 120 children.

| Height, h (cm) | Frequency |
|-------------------|-----------|
| $40 < h \leq 60$ | 30 |
| $60 < h \leq 70$ | 20 |
| $70 < h \leq 75$ | |
| $75 < h \leq 95$ | 50 |
| $95 < h \leq 105$ | |
| Total = 120 | |



13 (a) Complete the table and the histogram. (3 marks)

13 (b) Calculate an estimate of the upper quartile of the heights of the 120 children.

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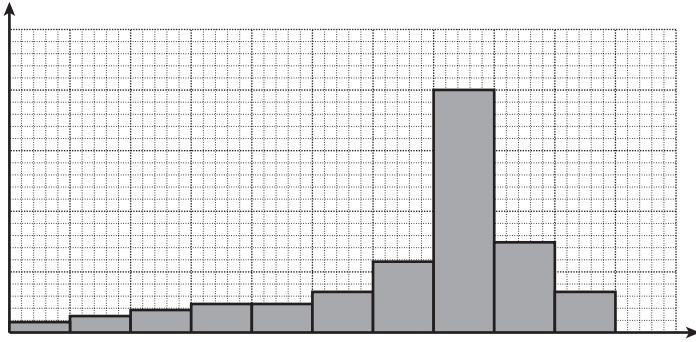
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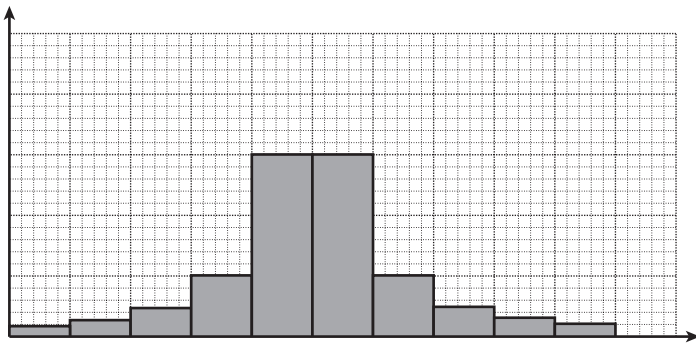
Answer cm (2 marks)



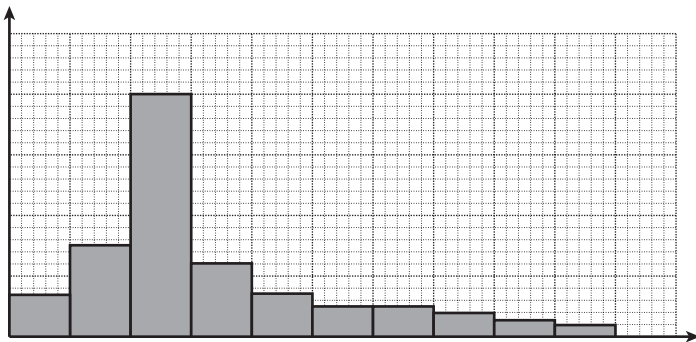
14 Here are the histograms for four different sets of data.
Each set of data has the same number of values.



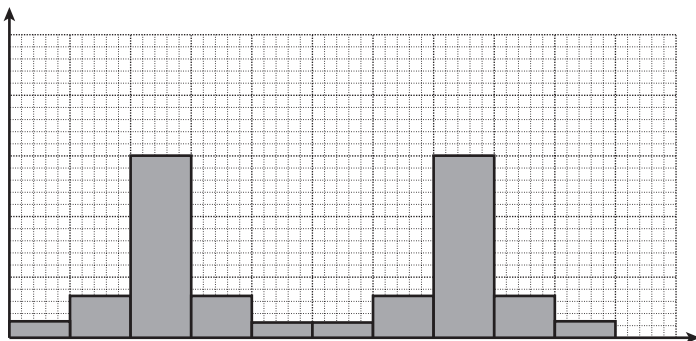
Histogram 1



Histogram 2



Histogram 3

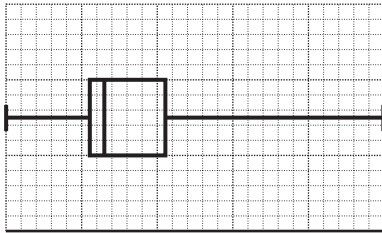


Histogram 4

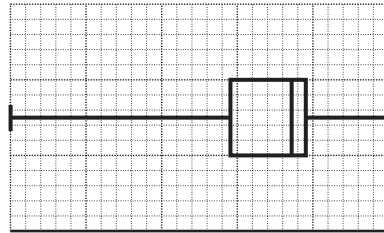


Here are the box plots for the same four sets of data.

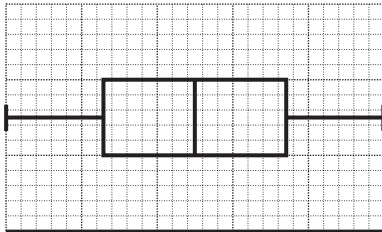
Box plot A



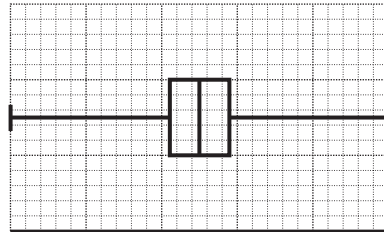
Box plot B



Box plot C



Box plot D



Complete the table to match each box plot to a histogram.

| Histogram | Box plot |
|-----------|----------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

(3 marks)

END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

