Surname	
Other Names	
Candidate Signature	

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GCSE
Mathematics (Non-calculator Paper)

Practice Paper Style Questions
Topic: Cumulative Frequency (Higher Tier)

For this paper you must have:

- black pen
- HB pencil
- ruler (with cm & mm)
- rubber
- protractor
- compass
- pencil sharpener

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 space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is **43**.
  The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper.
  These must be tagged securely to this answer booklet.
- A calculator MUST NOT be used.

Advice

- Read each question carefully before you answer it.
- In all calculations, show clearly how you work out your answer.
- Check your answers if you have time at the end.

There are no questions printed on this page

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1 This table shows information about the height, h millimetres, 120 bean plants grow in a fortnight:

Height (h millimetres)	Frequency
$70 < h \le 80$	3
$80 < h \le 90$	11
$90 < h \le 100$	35
$100 < h \le 110$	33
$110 < h \le 120$	27
$120 < h \le 130$	11

(a) Write down the modal class interval.

Answer .... *(1 mark)*

(b) Complete the cumulative frequency table:

Height (h millimetres)	Cumulative Frequency
$70 < h \le 80$	3
$80 < h \le 90$	
$90 < h \le 100$	
$100 < h \le 110$	
$110 < h \le 120$	
$120 < h \le 130$	

(1 mark)

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(c) On the grid below, draw a cumulative frequency graph for your cumulative frequency table.

Height (h millimetres)
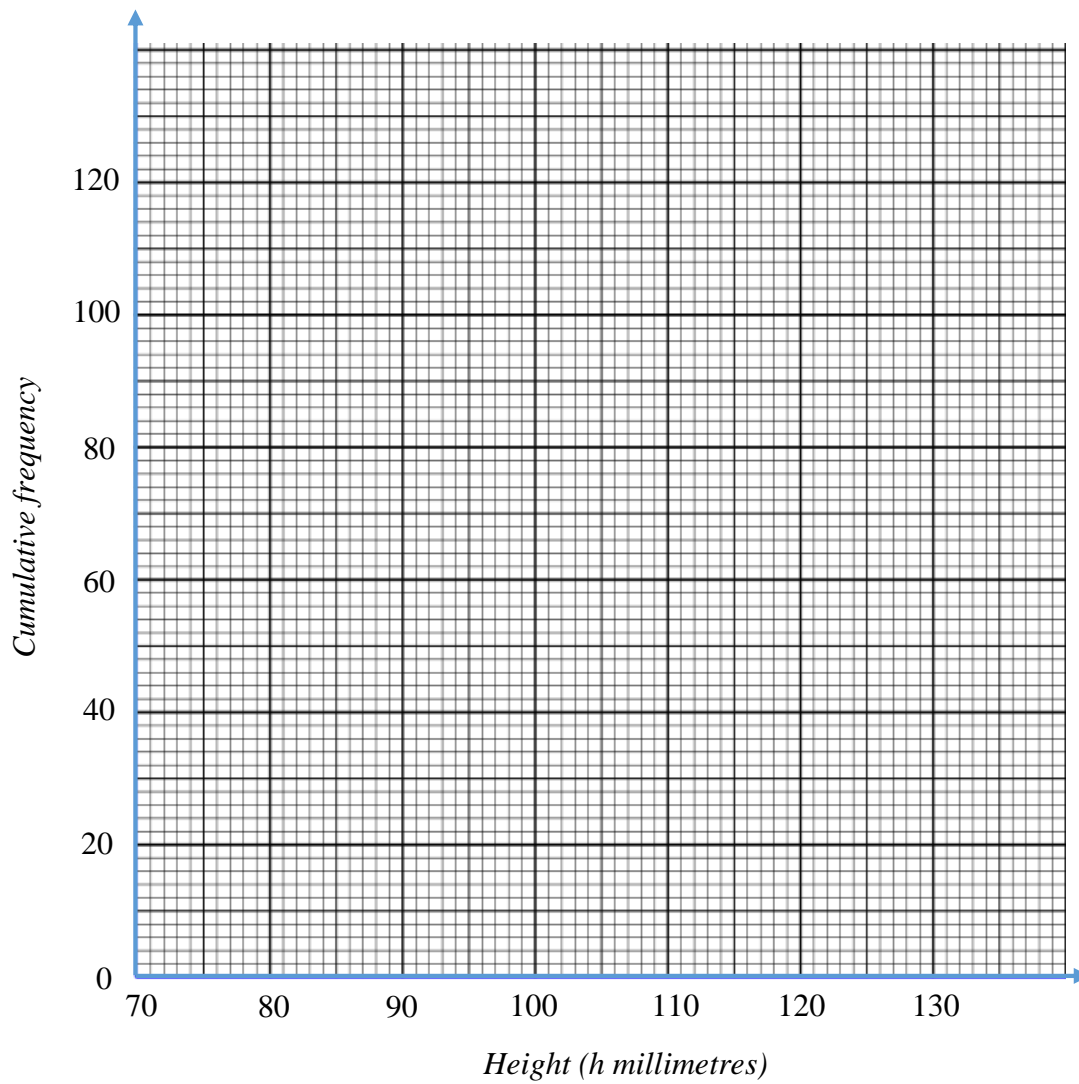
(2 marks)

(d) Use your graph to find an estimate for the median.

Answer ....*mm......* *(1 mark)*
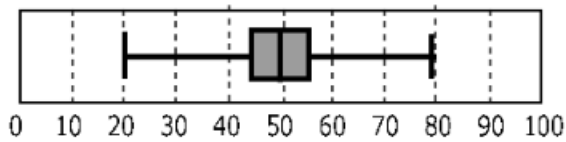
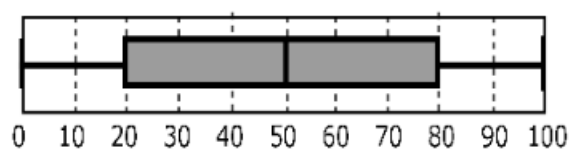**2**   Here are four cumulative frequency diagrams:
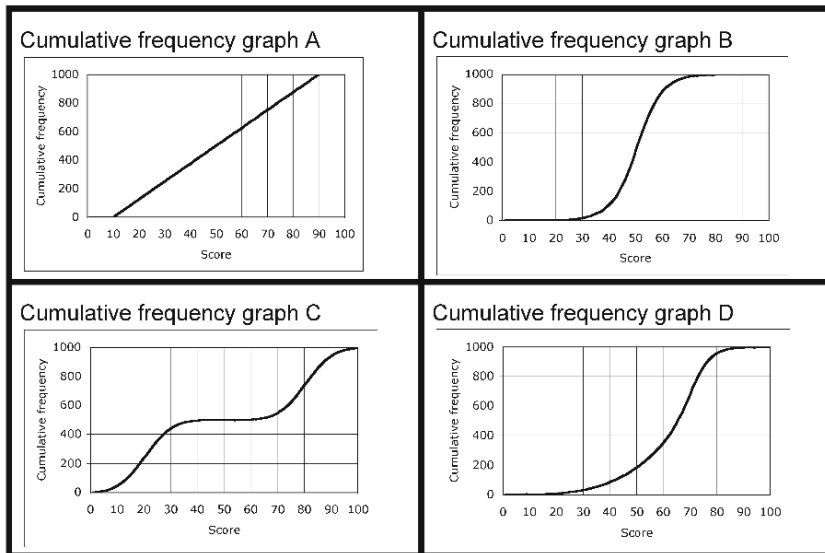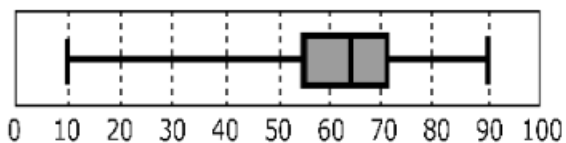

Here are four box and whisker plots:

Box & Whisker Plot 1

Box & Whisker Plot 2

Box & Whisker Plot 3

Box & Whisker Plot 4
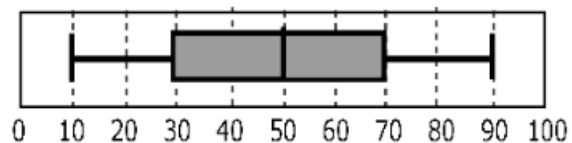
For each box and whisker plot, write down the letter of the matching cumulative frequency diagram.

1	2	3	4

(2 marks)

5

3 This table shows information about the number of aces served by players in a tennis tournament:

Number of aces	Frequency
$0 < n \leq 20$	14
$20 < n \leq 30$	28
$30 < n \leq 40$	22
$40 < n \leq 50$	11
$50 < n \leq 60$	5

(a) Write down the modal class interval.

Answer .... *(1 mark)*

(b) Complete the cumulative frequency table:

Number of aces	Cumulative Frequency
$0 < n \leq 20$	
$20 < n \leq 30$	
$30 < n \leq 40$	
$40 < n \leq 50$	
$50 < n \leq 60$	

(1 mark)

(c) On the grid below, draw a cumulative frequency graph for your cumulative frequency table.
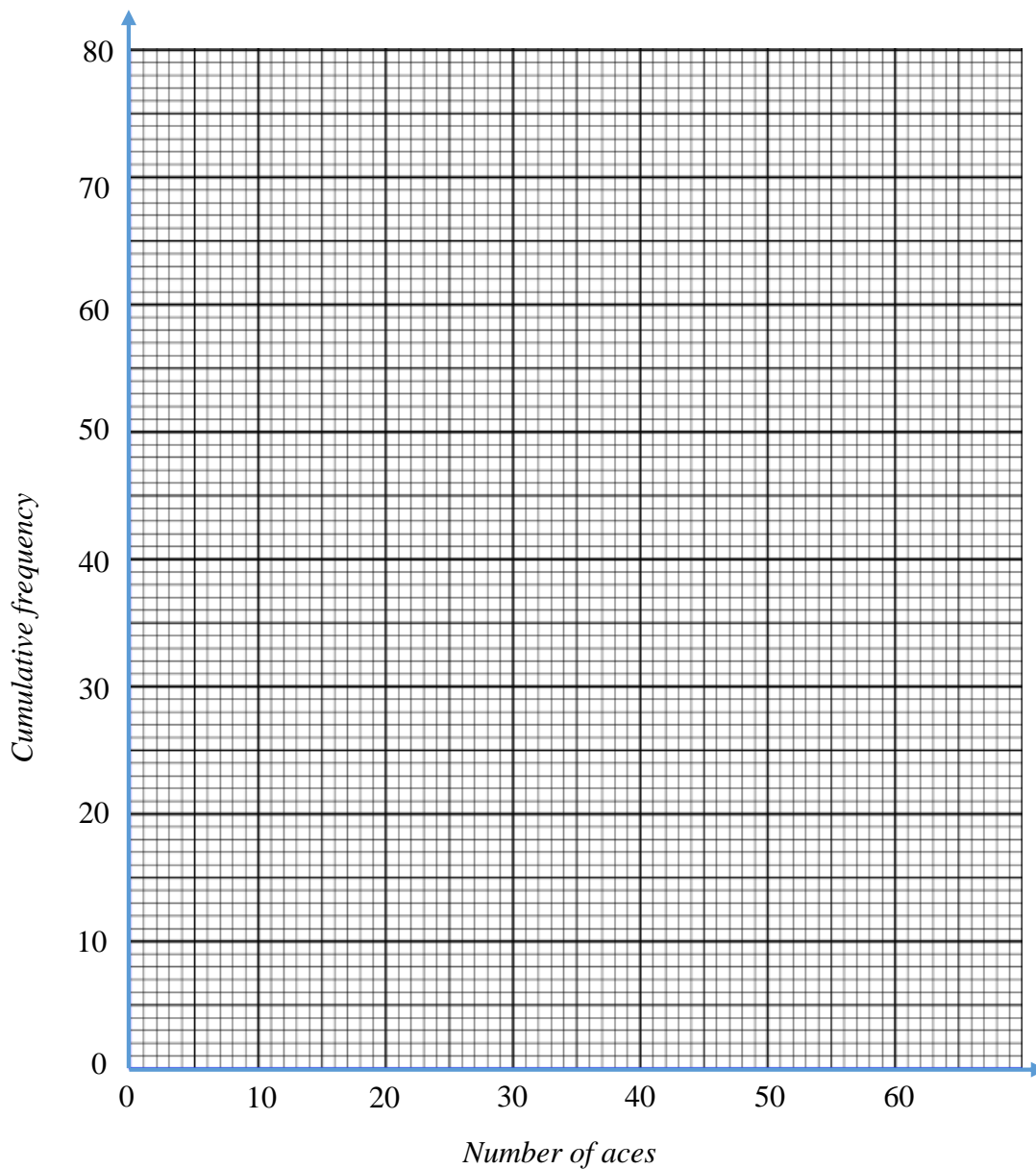
Number of aces

(2 marks)

(d) Use your graph to find an estimate for:

(i) the median number of aces;

Answer .... *(1 mark)*

(ii) the interquartile range of the number of aces.

Answer .... *(2 marks)*

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4 This table shows information about the number of apps on 100 children's tablets:

Number of apps	Frequency
$0 < n \leq 20$	18
$20 < n \leq 40$	20
$40 < n \leq 60$	37
$60 < n \leq 80$	16
$80 < n \leq 100$	7
$100 < n \leq 120$	2

(a) Complete the cumulative frequency table below for this information:

Number of apps	Cumulative Frequency
$0 < n \leq 20$	
$20 < n \leq 40$	
$40 < n \leq 60$	
$60 < n \leq 80$	
$80 < n \leq 100$	
$100 < n \leq 120$	

(1 mark)

(b) On the grid below, draw a cumulative frequency graph for your table.

Cumulative frequency
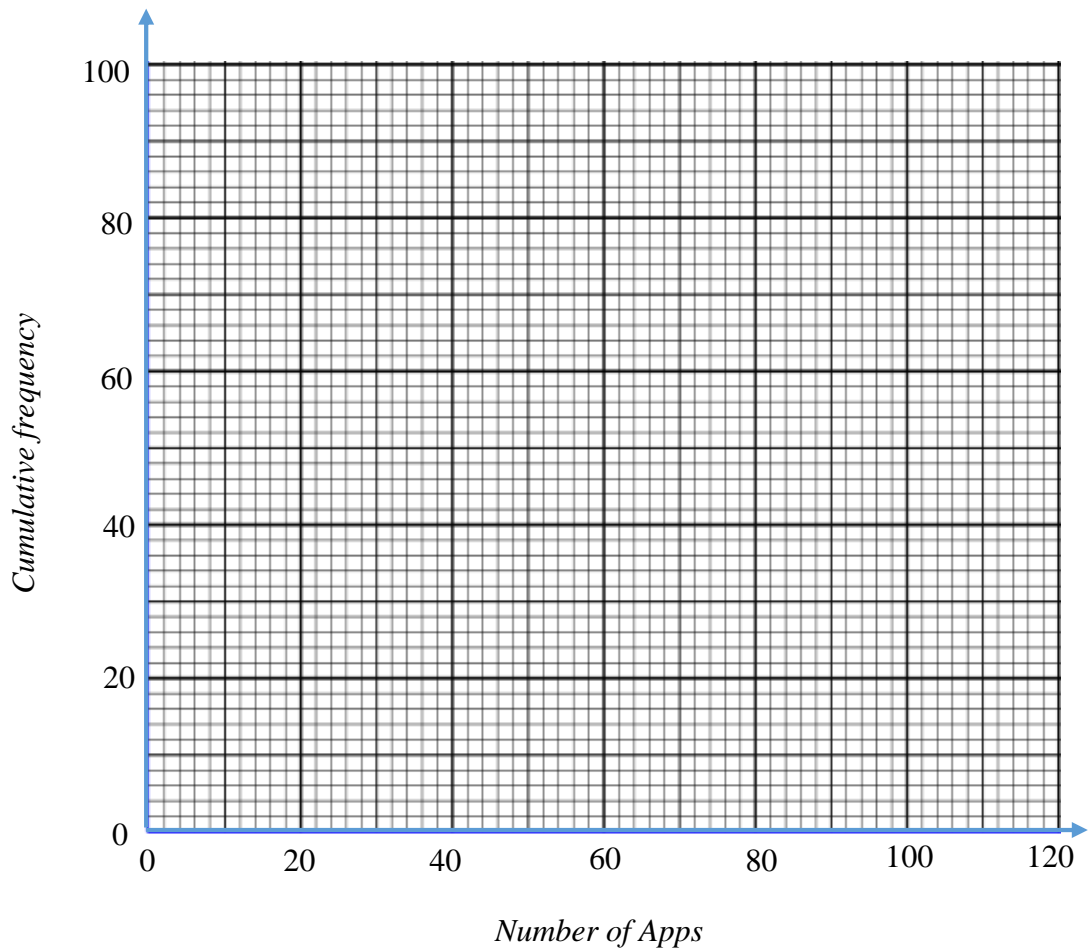
Number of Apps

(2 marks)

(c) Use your graph to find an estimate for the median number of apps.

Answer .... *(1 mark)*

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5 This table shows information about the ages, y years, of 60 teachers:

Age (y years)	Frequency
$20 < n \le 30$	12
$30 < n \le 40$	15
$40 < n \le 50$	18
$50 < n \le 60$	12
$60 < n \le 70$	3

(a) Complete the cumulative frequency table below for this information:

Age (y years)	Cumulative Frequency
$20 < n \le 30$	
$30 < n \le 40$	
$40 < n \le 50$	
$50 < n \le 60$	
$60 < n \le 70$	

(1 mark)

(b) On the grid below, draw a cumulative frequency graph for your table.

Cumulative frequency

Age in Years
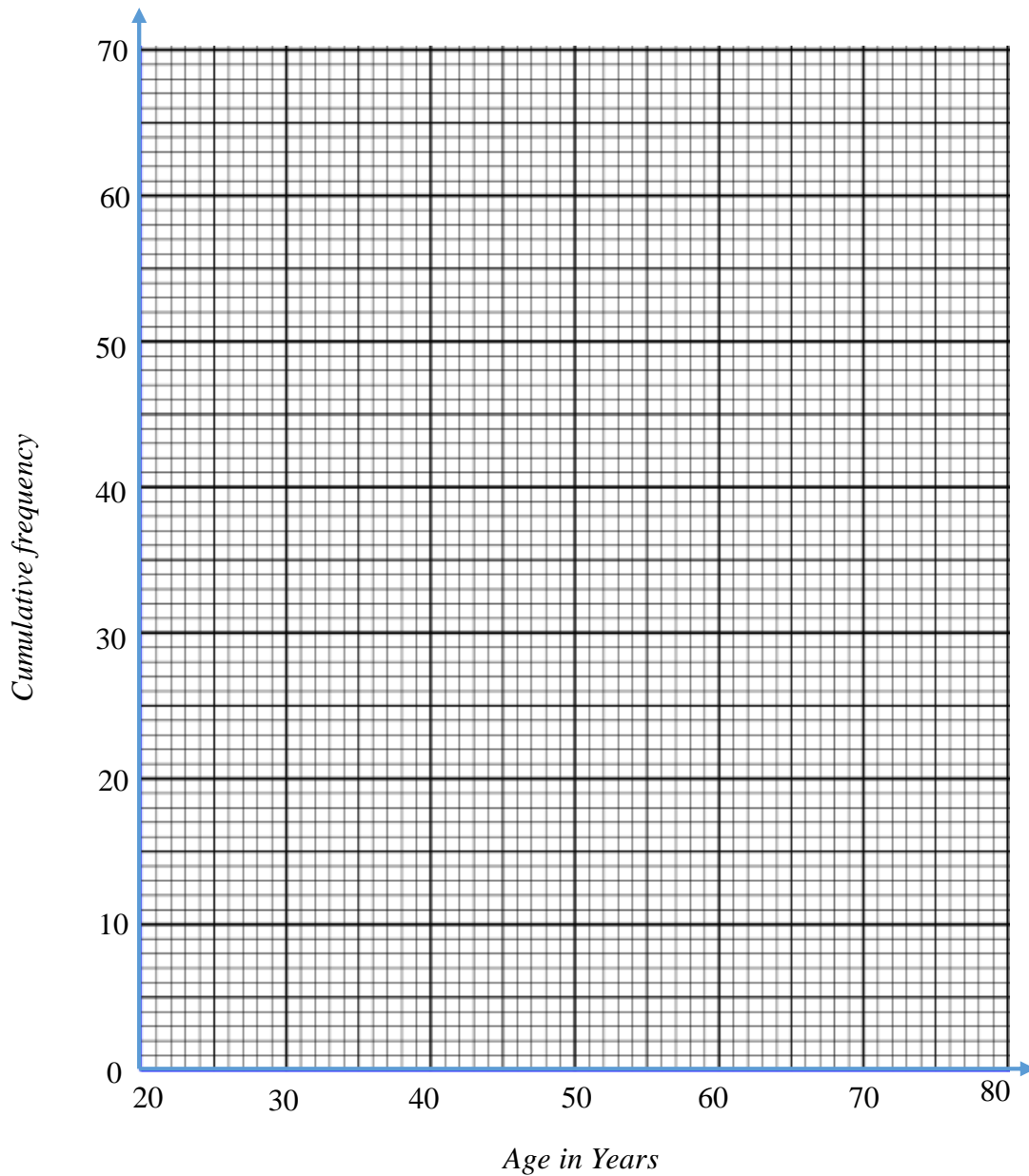
(2 marks)

(c) Use your graph to find an estimate for the median age.

Answer .... *(1 mark)*

(d) Use your cumulative frequency graph to find an estimate for the number of teachers older than 55 years.

Answer .... *(1 mark)*

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6 This table shows information about the marks (m) scored by 120 students in an exam:

Mark m	Frequency
$0 < m \leq 20$	7
$20 < m \leq 40$	12
$40 < m \leq 60$	45
$60 < m \leq 80$	36
$80 < m \leq 100$	20

(a) On the grid below, draw a cumulative frequency graph for this information.
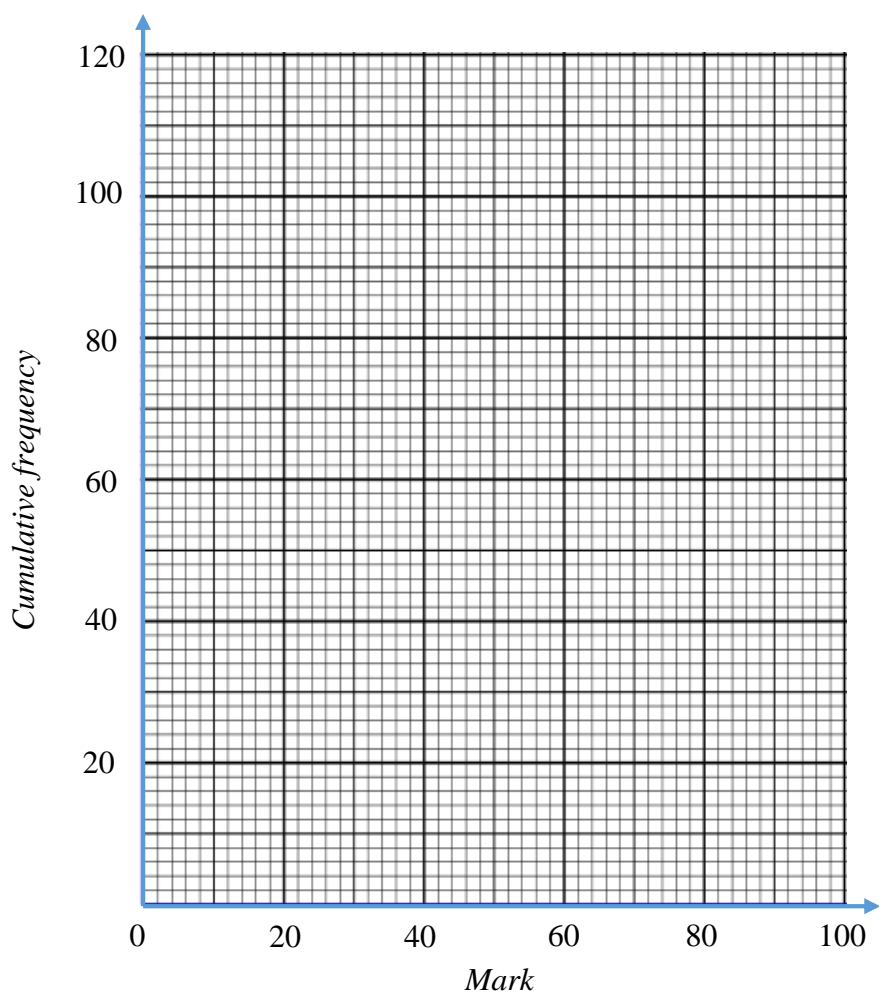
(3 marks)

(b) 75% of the students pass the exam.

Use the cumulative frequency graph to estimate the pass mark.

Answer .... *(2 marks)*

(c) Use your cumulative frequency graph to find an estimate for the interquartile range.

Answer .... *(2 marks)*

(d) Use your cumulative frequency graph to find an estimate for the following:

(i) The number of students who scored **less** than 50 marks.

Answer .... *(1 mark)*

(ii) The number of students who scored **more** than 70 marks.

Answer .... *(1 mark)*

(iii) The number of students who scored **more** than 90 marks.

Answer .... *(1 mark)*

10

7 Paul measured the height, in cm, of each of the cucumber plants in his greenhouse.

He used his measurements to draw the box-and-whisker plot shown below:

Height in cm
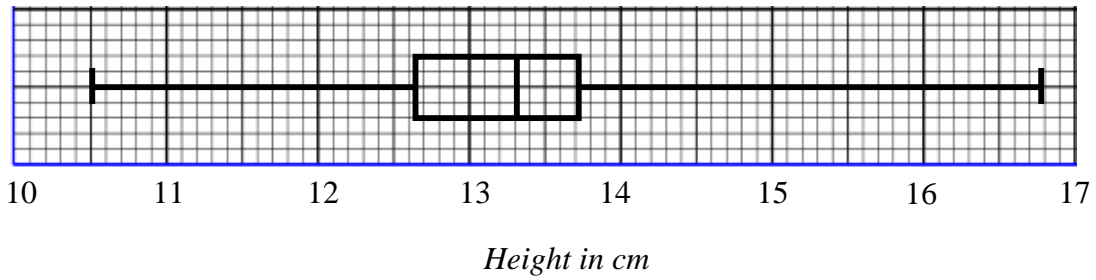
(a) Write down the median height.

Answer ....cm....... *(1 mark)*

(b) Work out the interquartile range.

Answer ....cm....... *(2 marks)*

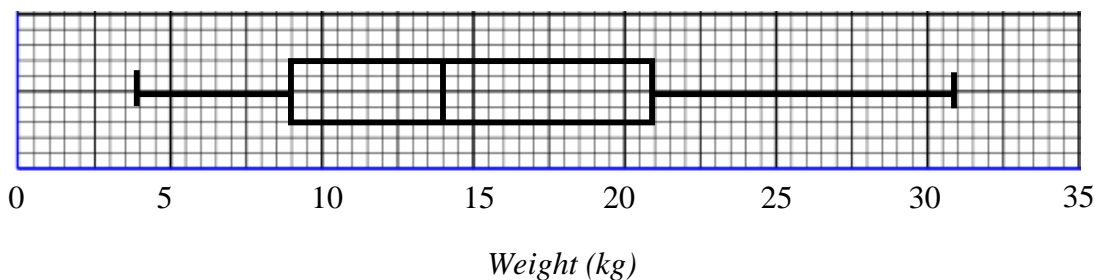**(c)** *Explain why the interquartile range may offer a better measure of spread than the range.

....

....

(1 mark)

8   This box-and-whisker plot gives information about the weights of bags on a train:

Weight (kg)

(a)   Write down the median weight.

Answer   ....kg....... *(1 mark)*

(b)   Work out the interquartile range of the weights.

Answer   ....kg....... *(2 marks)*

(c)   *Jo says the lightest bag weighs 9kg. She is **wrong**. Explain why.

....

....

(1 mark)

There are 270 bags on the train.

(d)   Work out the number of bags with a weight of 21kg or more.

Answer   .... *(2 marks)*

END OF QUESTIONS

10

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