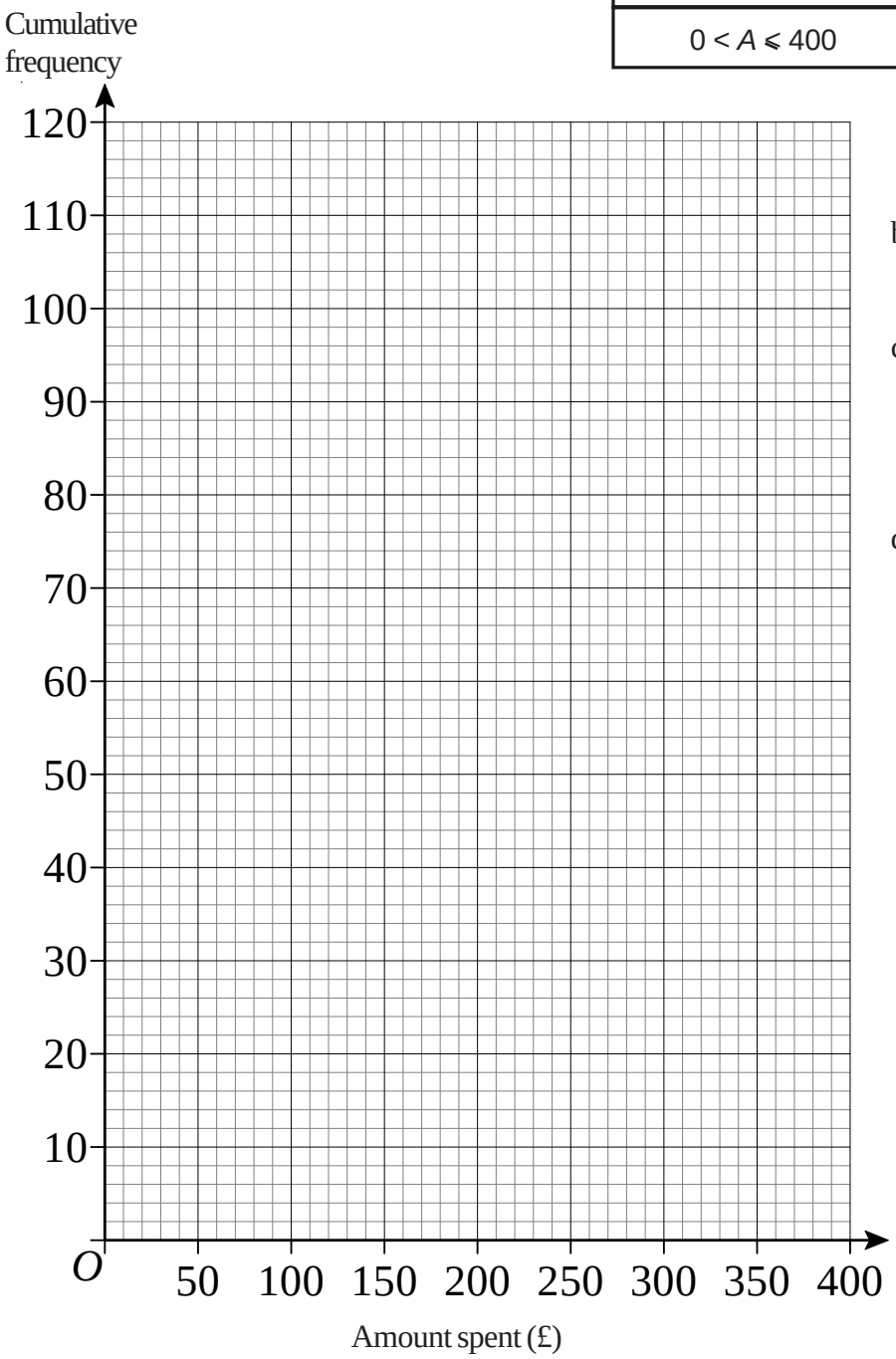
Cumulative Frequency

Fred did a survey about the amount of money spent by 120 men at Christmas.
The cumulative frequency table gives some information about the amounts of money spent by the 120 men.

Amount (£A) spent	Cumulative frequency
$0 < A \leqslant 100$	12
$0 < A \leqslant 150$	26
$0 < A \leqslant 200$	42
$0 < A \leqslant 250$	64
$0 < A \leqslant 300$	93
$0 < A \leqslant 350$	112
$0 < A \leqslant 400$	120

a) On the grid, draw a cumulative frequency diagram.



b) Use your cumulative frequency diagram to estimate the median.

c) Use your cumulative frequency diagram to estimate the interquartile range of the amount of money spent.

d) Use your cumulative frequency diagram to estimate the number of men who spent more than £330.

Cumulative Frequency

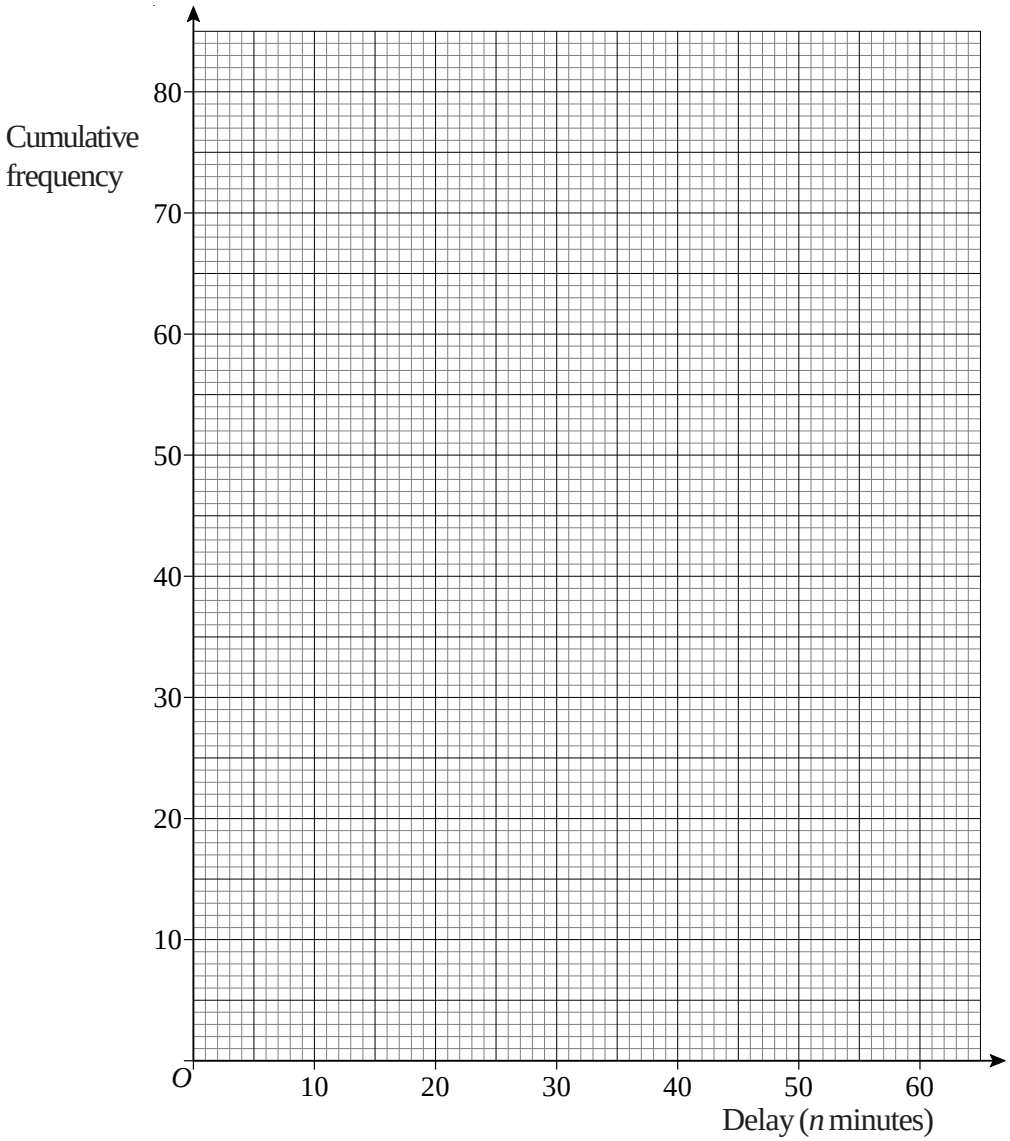
The table gives some information about the delay, in minutes, of 80 trains.

a) Complete the cumulative frequency table.

Delay (n minutes)	Frequency
$0 < n \leqslant 20$	16
$20 < n \leqslant 30$	27
$30 < n \leqslant 40$	22
$40 < n \leqslant 50$	10
$50 < n \leqslant 60$	5

Delay (n minutes)	Cumulative Frequency
$0 < n \leqslant 20$	
$0 < n \leqslant 30$	
$0 < n \leqslant 40$	
$0 < n \leqslant 50$	
$0 < n \leqslant 60$	

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



c) Use your graph to find an estimate for

(i) the median delay.

(ii) the interquartile range of the delays.

(iii) the number of trains delayed for more than 53 minutes.

Cumulative Frequency

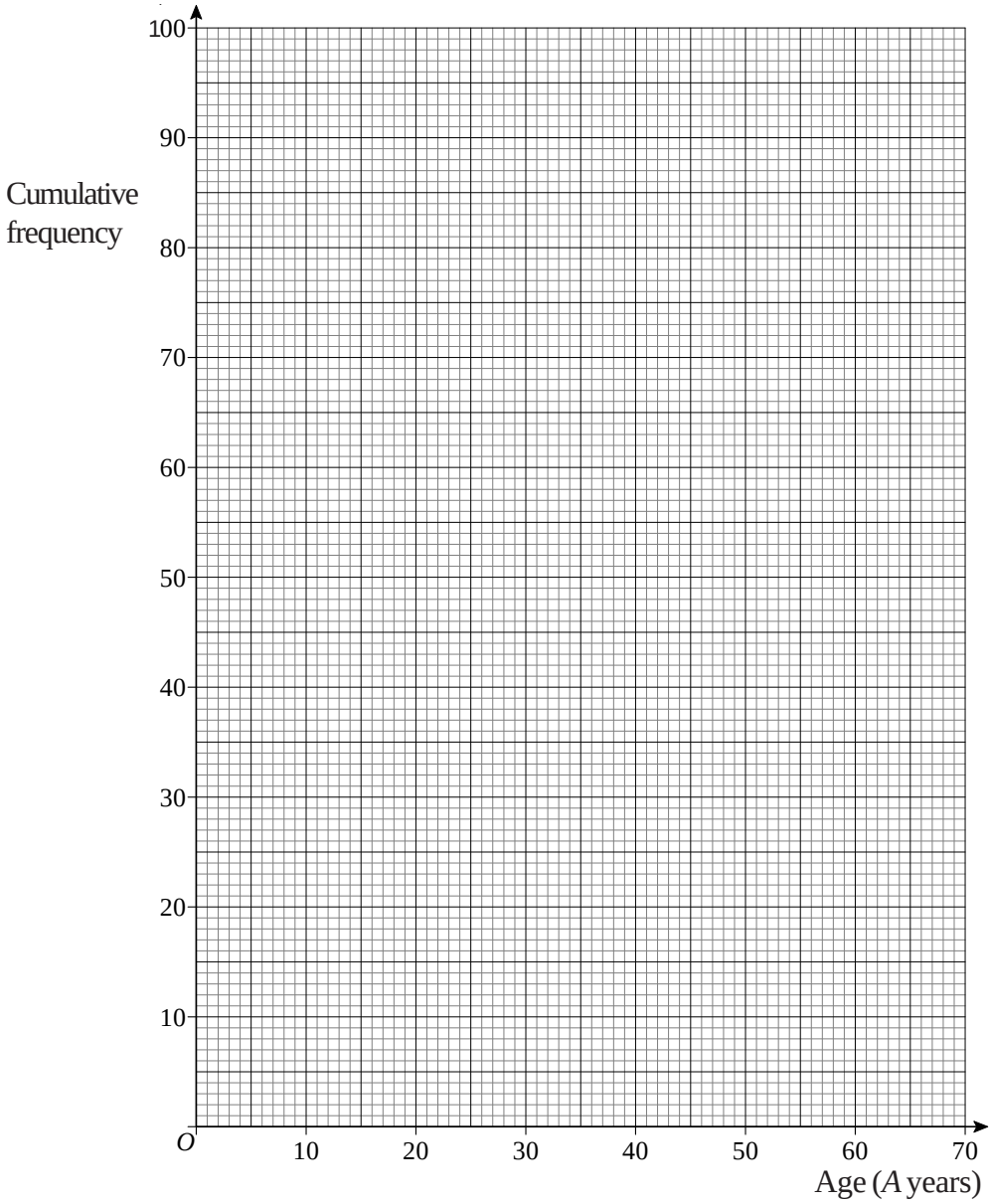
There are 100 teachers at Sam's school.
Sam found out the age of each teacher.
The table gives information about her results.

Age (A years)	Frequency
$20 < A \leqslant 30$	25
$30 < A \leqslant 40$	36
$40 < A \leqslant 50$	22
$50 < A \leqslant 60$	11
$60 < A \leqslant 70$	6

a) Complete the cumulative frequency table

Age (A years)	Cumulative Frequency
$20 < A \leqslant 30$	25
$20 < A \leqslant 40$	
$20 < A \leqslant 50$	
$20 < A \leqslant 60$	
$20 < A \leqslant 70$	

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



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

d) Use your graph to find an estimate for the number of these teachers who are **older** than 56 years old.

Cumulative Frequency

This table shows information about the time, *m* minutes, it takes to show each of 120 films.

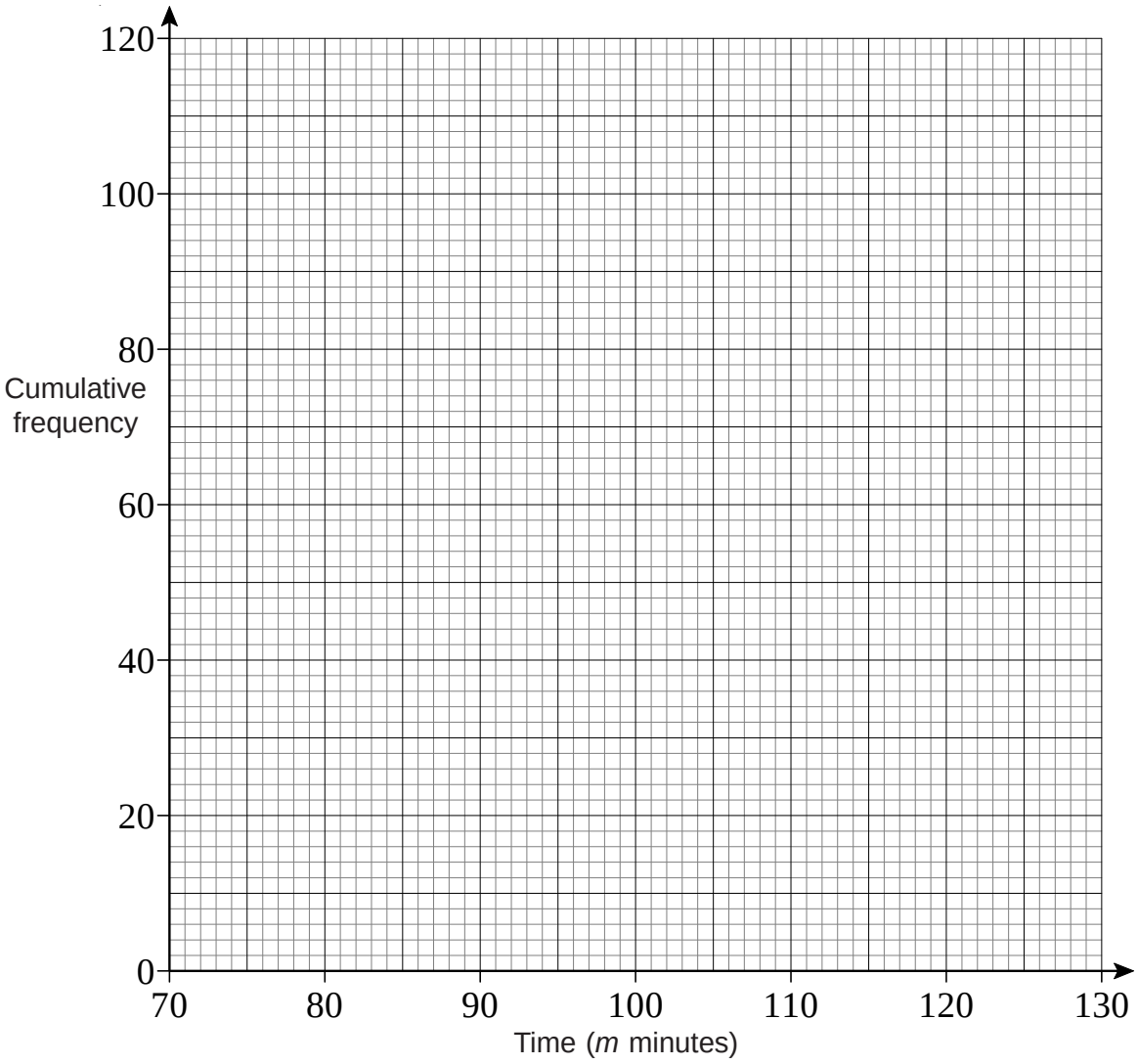
Time (*m* minutes)	Frequency
$70 < m \leqslant 80$	3
$80 < m \leqslant 90$	13
$90 < m \leqslant 100$	34
$100 < m \leqslant 110$	32
$110 < m \leqslant 120$	26
$120 < m \leqslant 130$	12

a) Write down the modal class interval.

b) Complete this cumulative frequency table.

Time (*m* minutes)	Cumulative frequency
$70 < m \leqslant 80$	3
$70 < m \leqslant 90$	
$70 < m \leqslant 100$	
$70 < m \leqslant 110$	
$70 < m \leqslant 120$	
$70 < m \leqslant 130$	

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



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

e) Use your graph to find an estimate for the interquartile range of times.

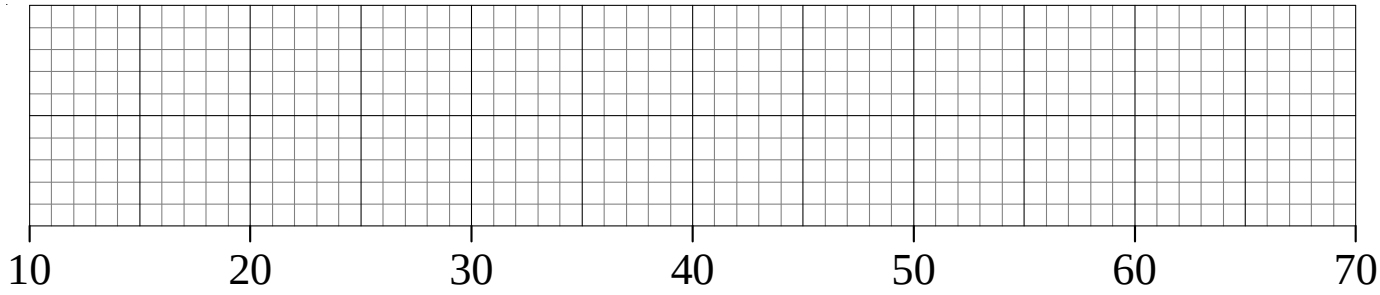
f) Use your graph to find an estimate for the number of films which take longer than 115 minutes to show.

Boxplots

1) The ages of 20 teachers are listed below.

22, 22, 24, 25, 27, 27, 28, 29, 29, 29, 34, 35, 41, 43, 44, 49, 55, 57, 58, 58

a) On the grid below, draw a box plot to show the information about the teachers.



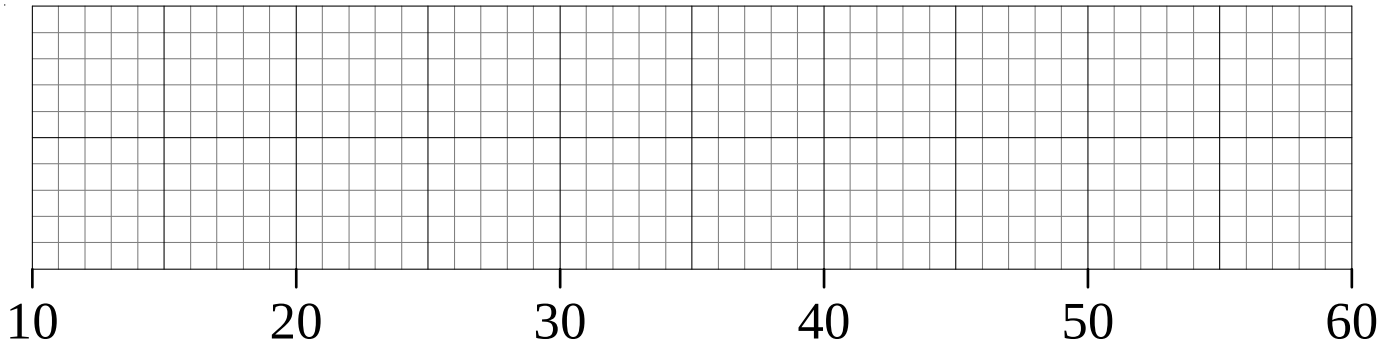
b) What is the interquartile range of the ages of the teachers?

2) A warehouse has 60 employees working in it.

The age of the youngest employee is 16 years.
The age of the oldest employee is 55 years.

The median age is 37 years.
The lower quartile age is 29 years.
The upper quartile age is 43 years.

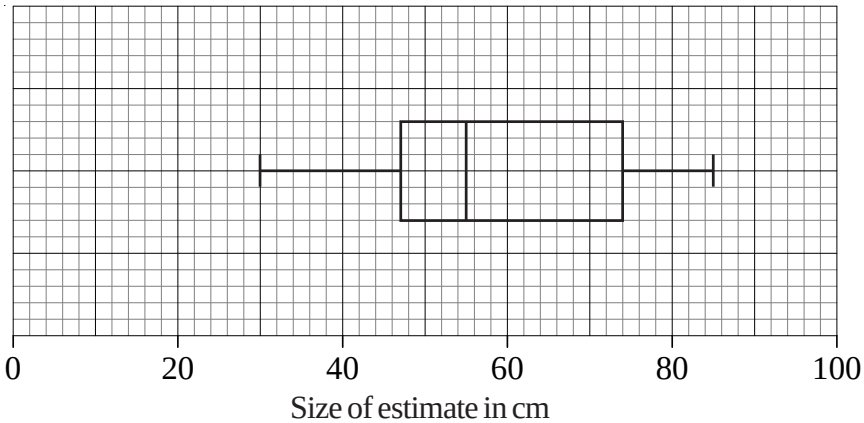
On the grid below, draw a box plot to show information about the ages of the employees.



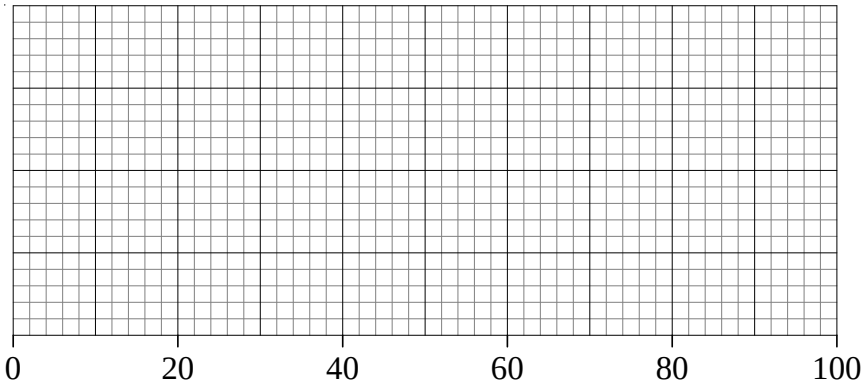
Boxplots

Terry drew a line of length 60 cm.
He asked some children to estimate the length of the line he had drawn.
He recorded their estimates.
The box plot gives some information about these estimates.

Children's estimates



Adults' estimates



a) Write down the median of the children's estimates.

b) Write down the interquartile range of the children's estimates.

Terry then asked some adults to estimate the length of the line he had drawn.
The table gives some information about the adults' estimates.

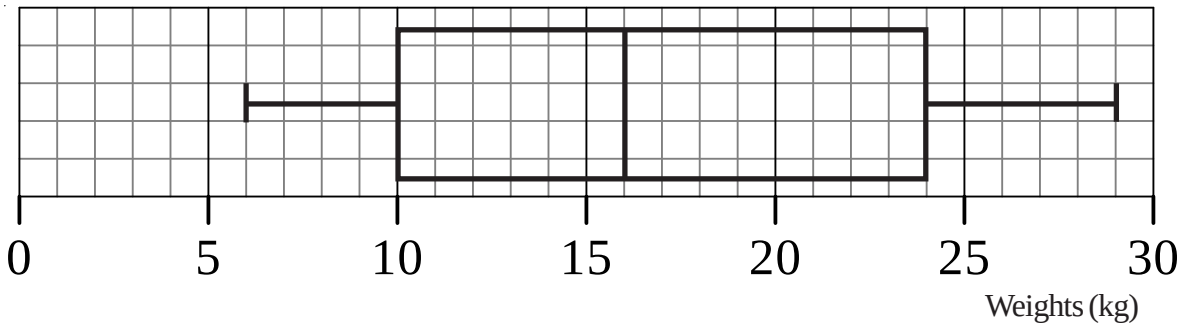
	Length
Lowest estimate	20 cm
Lower quartile	45 cm
Median	62 cm
Upper quartile	75 cm
Highest estimate	95 cm

c) On the grid above, draw a box plot to show this information.

d) Use the two box plots to compare the distribution of the children's estimates with the distribution of the adults' estimates.

Boxplots

1) The box plot gives information about the distribution of the weights of bags on a plane.



a) Claude says that the heaviest bag weighs 24 kg.
He is **wrong**.
Explain why.

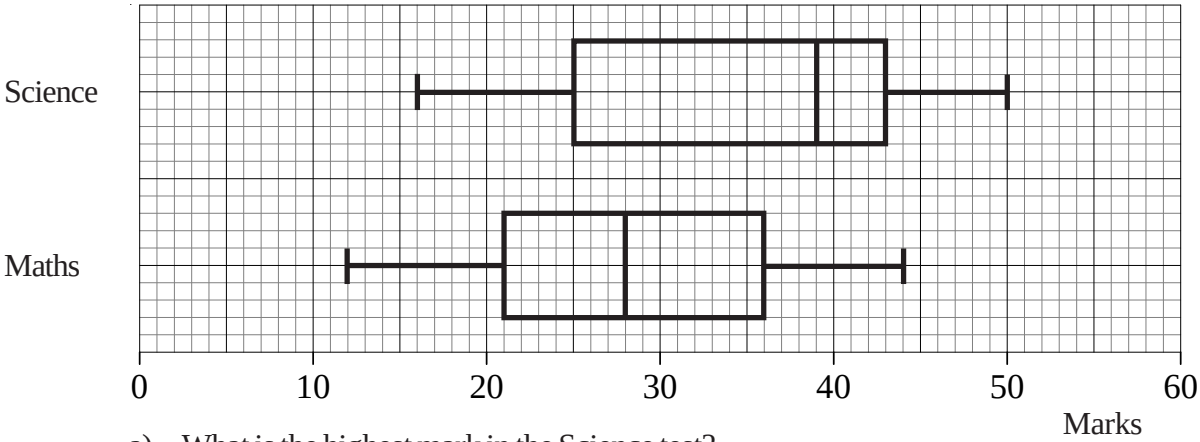
b) Write down the median weight.

c) Work out the interquartile range of the weights.

There are 240 bags on the plane.

d) Work out the number of bags with a weight of 10 kg or less.

2) The box plots show the distribution of marks in a Science and Maths test for a group of students.



a) What is the highest mark in the Science test?

b) Compare the distribution of the marks in the Science test and marks in the Maths test.

1 .....

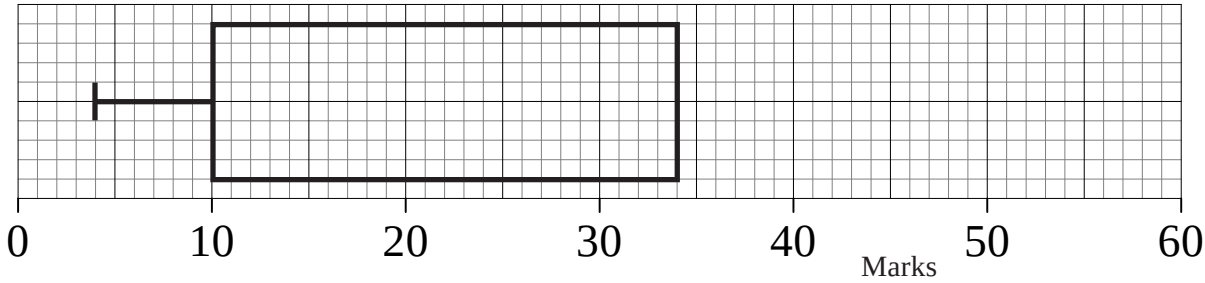
.....

2 .....

.....

Boxplots

1) The incomplete box plot and table show some information about some marks.

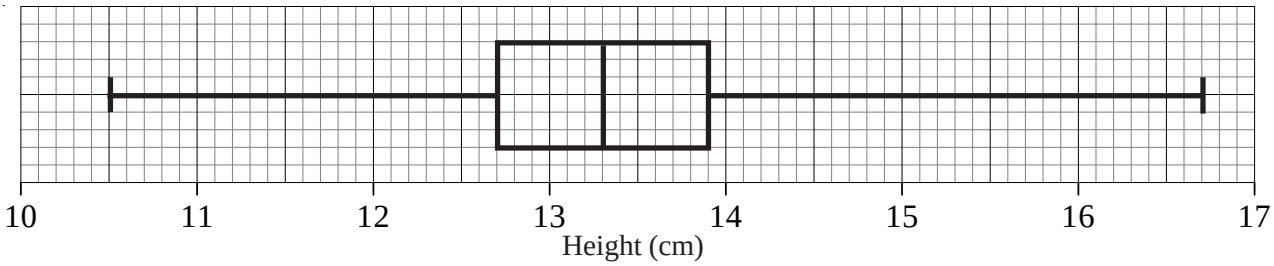


	Marks
Lowest mark	4
Lower quartile	
Median	30
Upper quartile	34
Highest mark	55

a) Use the information in the table to complete the box plot.

b) Use the information in the box plot to complete the table.

2) Kim measured the height, in cm, of each tomato plant in her greenhouse.
She used the results to draw the box plot shown below.



a) Write down the median height.

b) Work out the interquartile range.

c) Explain why the interquartile range may be a better measure of spread than the range.