Chhetri Academy

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GCSE MATHS

Statistics

Edexcel 1MA1 | Subtopic collection Topic 57

Averages and spread

Higher tier

Past paper question booklet

139	2003-2025	Higher
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

3. A garage keeps records of the costs of repairs to its customers' cars.
The table gives information about the costs of all repairs which were less than £250 in one week.

Leave blank

Cost, (£C)	Frequency
$0 < C \leqslant 50$	4
$50 < C \leqslant 100$	8
$100 < C \leqslant 150$	7
$150 < C \leqslant 200$	10
$200 < C \leqslant 250$	11

(a) Find the class interval in which the median lies.

. .....

(2)

There was only one further repair that week, not included in the table.
That repair cost £1000.

Dave says 'The class interval in which the median lies will change.'

(b) Is Dave correct? Explain your answer.

.....

.....

(1)

The garage also sells cars.
It offers a discount of 20% off the normal price for cash.

Dave pays £5200 cash for a car.

(c) Calculate the normal price of the car.

£ .....

(3)

8. The table shows information about the heights of 40 bushes.

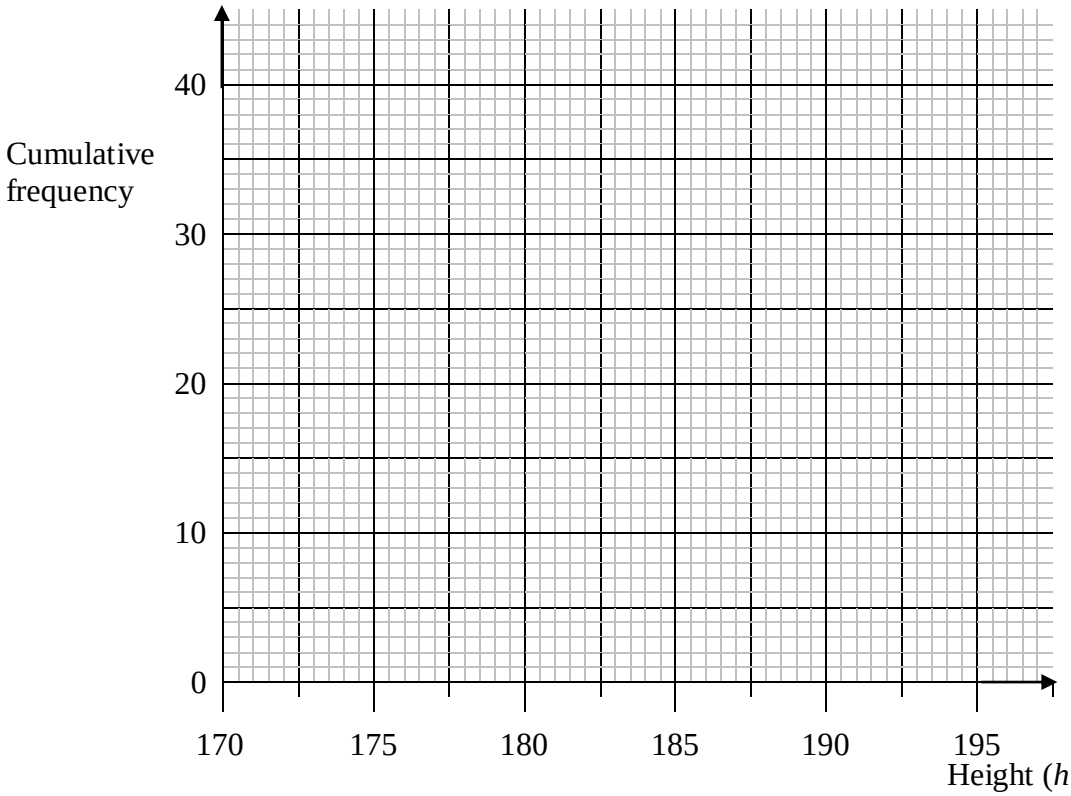
Height (h cm)	Frequency
$170 \leq h < 175$	5
$175 \leq h < 180$	18
$180 \leq h < 185$	12
$185 \leq h < 190$	4
$190 \leq h < 195$	1

(a) Complete the cumulative frequency table.

Height (h cm)	Cumulative Frequency
$170 \leq h < 175$	
$170 \leq h < 180$	
$170 \leq h < 185$	
$170 \leq h < 190$	
$170 \leq h < 195$	

(1)

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



(2)

(c) Use the graph to find an estimate for the median height of the bushes.

..... cm

(1)

5. Charles found out the length of reign of each of 41 kings.
He used the information to complete the frequency table.

Length of reign (L years)	Number of kings		
$0 < L \leq 10$	14		
$10 < L \leq 20$	13		
$20 < L \leq 30$	8		
$30 < L \leq 40$	4		
$40 < L \leq 50$	2		

(a) Write down the class interval that contains the median.

.....
(2)

(b) Calculate an estimate for the mean length of reign.

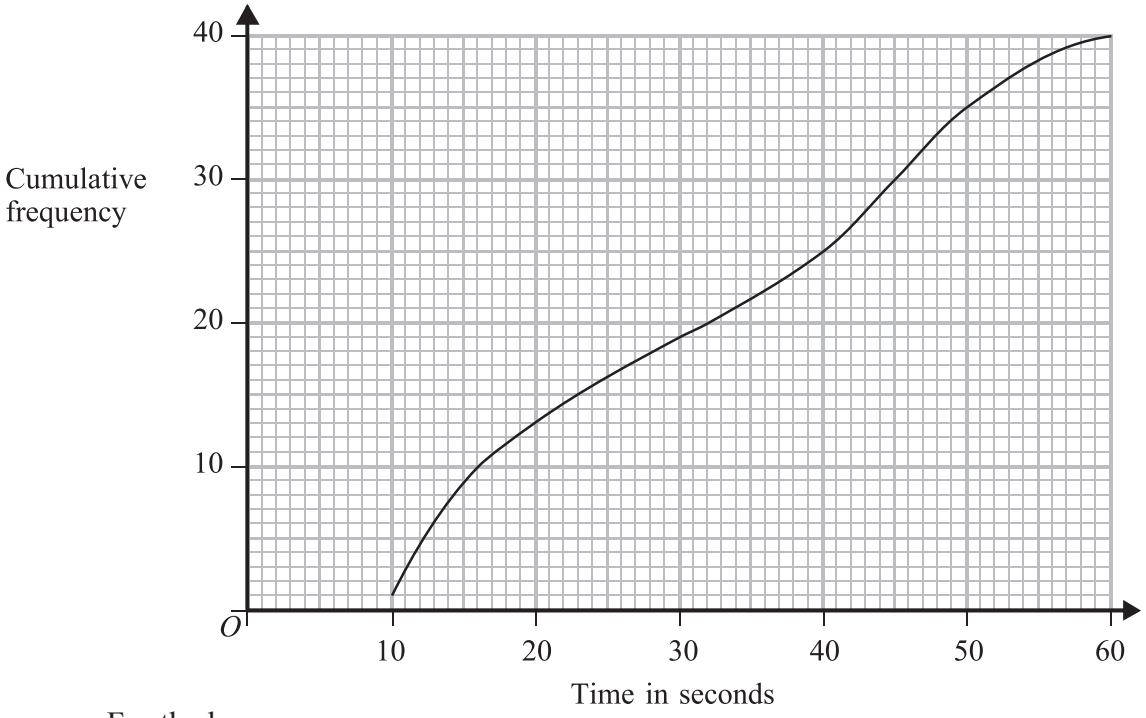
..... years
(4)

13. 40 boys each completed a puzzle.
The cumulative frequency graph opposite gives information about the times it took them to complete the puzzle.

(a) Use the graph to find an estimate for the median time.

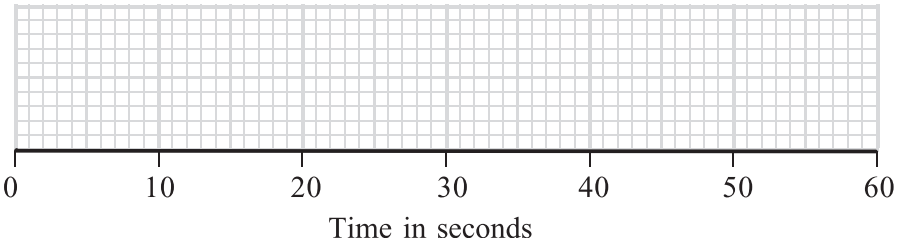
..... seconds
(1)

Blank



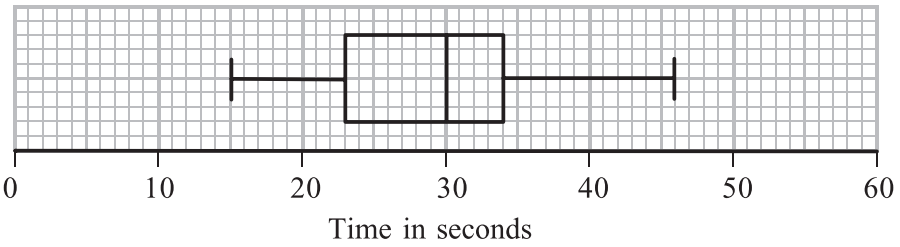
For the boys
the minimum time to complete the puzzle was 9 seconds
and the maximum time to complete the puzzle was 57 seconds.

(b) Use this information and the cumulative frequency graph to draw a box plot showing information about the boys' times.



(3)

The box plot below shows information about the times taken by 40 girls to complete the same puzzle.



(c) Make **two** comparisons between the boys' times and the girls' times.

.....

.....

(2)

Page Total

5. The table shows information about the number of hours that 120 children used a computer last week.

Number of hours (h)	Frequency
$0 < h \leqslant 2$	10
$2 < h \leqslant 4$	15
$4 < h \leqslant 6$	30
$6 < h \leqslant 8$	35
$8 < h \leqslant 10$	25
$10 < h \leqslant 12$	5

(a) Work out an estimate for the mean number of hours that the children used a computer. Give your answer correct to two decimal places.

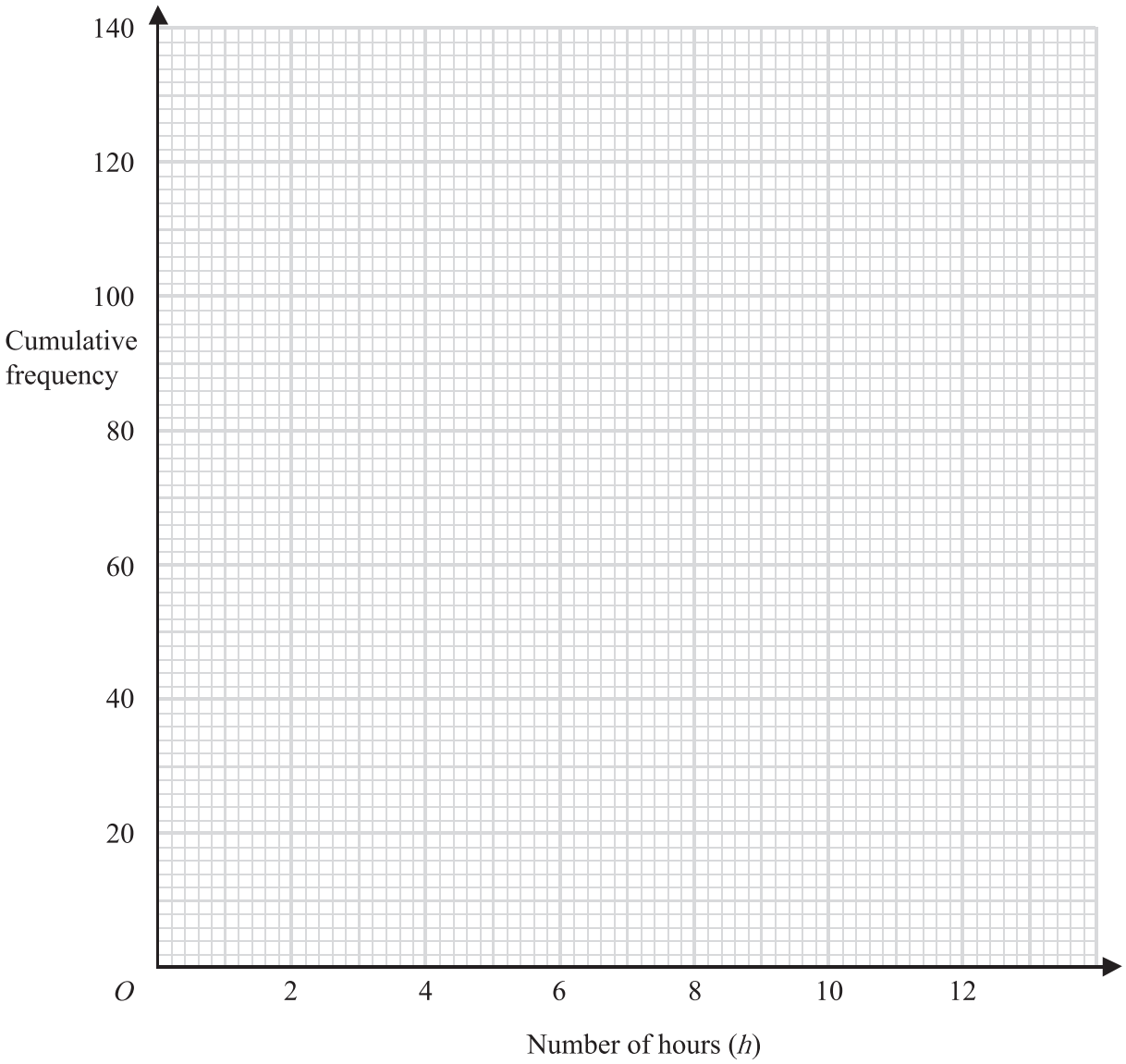
..... hours
(4)

(b) Complete the cumulative frequency table.

Number of hours (h)	Cumulative frequency
$0 < h \leqslant 2$	10
$0 < h \leqslant 4$	
$0 < h \leqslant 6$	
$0 < h \leqslant 8$	
$0 < h \leqslant 10$	
$0 < h \leqslant 12$	

(1)

blank



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

(2)

(d) Use your graph to find an estimate for the number of children who used a computer for **less** than 7 hours last week.

.....

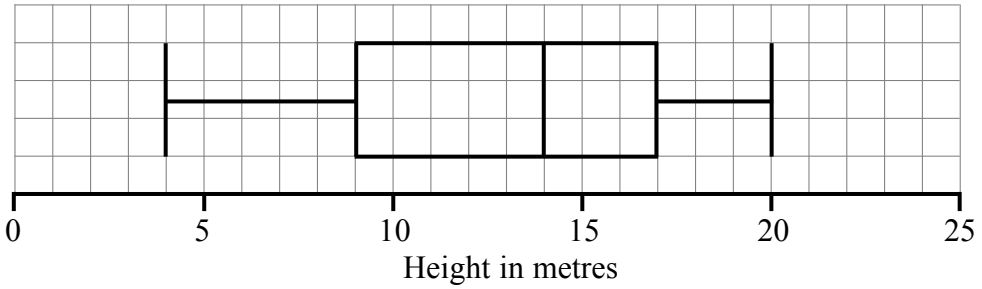
(2)

Q5

(Total 9 marks)

blank

12. The box plot gives information about the distribution of the heights of all the trees in a wood.



(a) Write down the median height of the trees.

..... m
(1)

(b) Work out the interquartile range of the heights of the trees.

..... m
(1)

There are 300 trees in the wood.

(c) Work out the number of trees in the wood with a height of 17 m or more.

.....
(2)

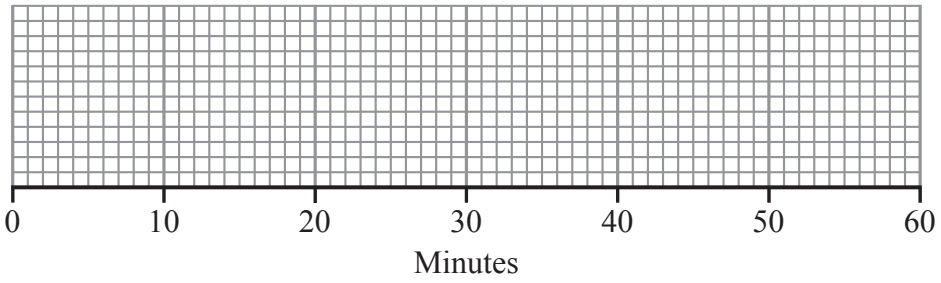
(Total 4 marks)

Q12

6. Mrs Raja set work for the students in her class.
She recorded the time taken, in minutes, for each student to do the work.
She used her results to work out the information in the table.

	Minutes
Shortest time	4
Lower quartile	14
Median	26
Upper quartile	30
Longest time	57

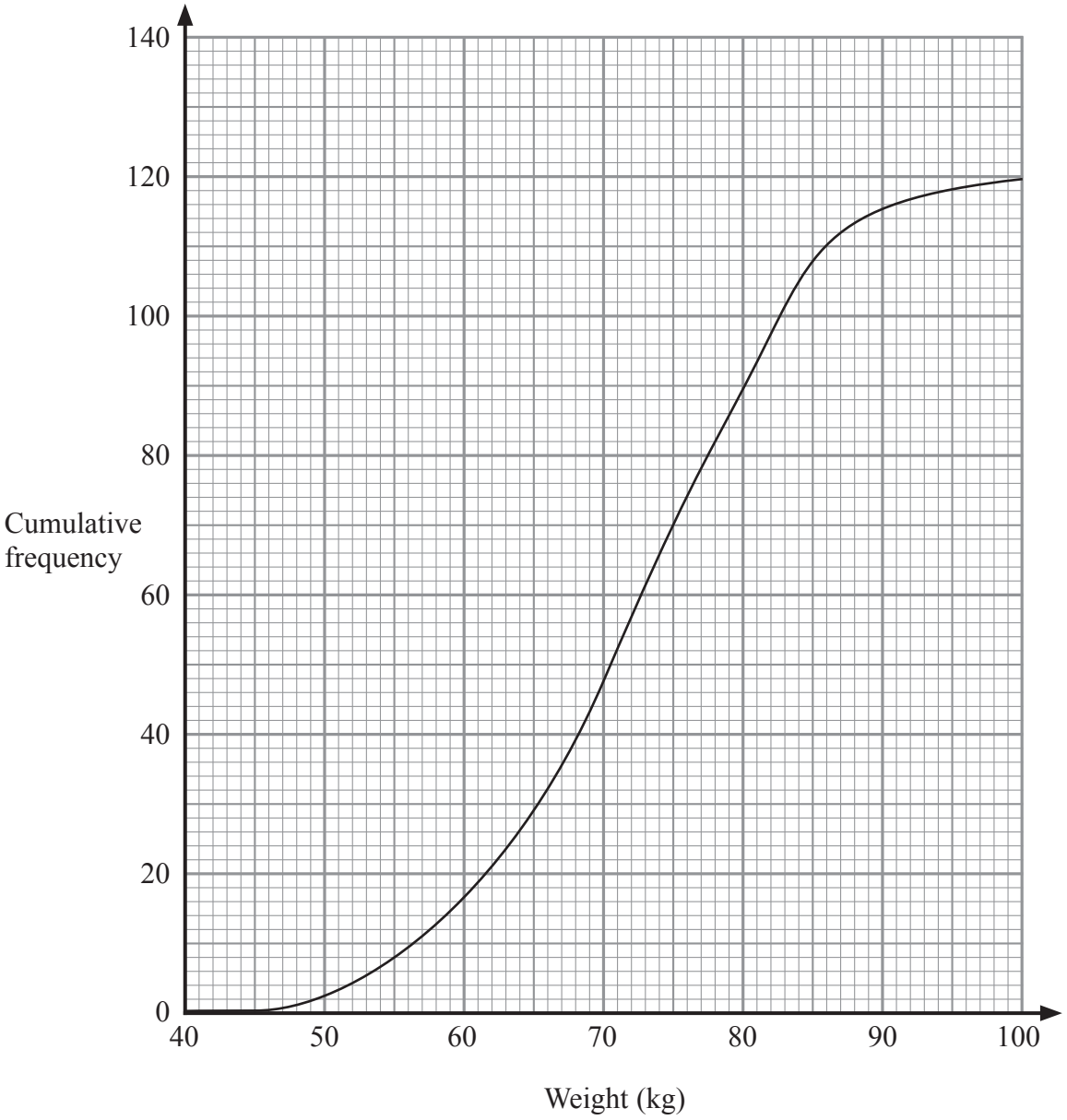
On the grid, draw a box plot to show the information in the table.



Q6

(Total 2 marks)

11. Here is the cumulative frequency curve of the weights of 120 girls at Mayfield Secondary School.



Use the cumulative frequency curve to find an estimate for the

(i) median weight,

..... kg

(ii) interquartile range of the weights.

..... kg

(Total 3 marks)

Q11

17. Lucy did a survey about the amounts of money spent by 120 men during their summer holidays.

The cumulative frequency table gives some information about the amounts of money spent by the 120 men.

Amount (£A) spent	Cumulative frequency
$0 \leqslant A < 100$	13
$0 \leqslant A < 150$	25
$0 \leqslant A < 200$	42
$0 \leqslant A < 250$	64
$0 \leqslant A < 300$	93
$0 \leqslant A < 350$	110
$0 \leqslant A < 400$	120

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

(2)

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

£ .....

(2)

A survey of the amounts of money spent by 200 women during their summer holidays gave a median of £205

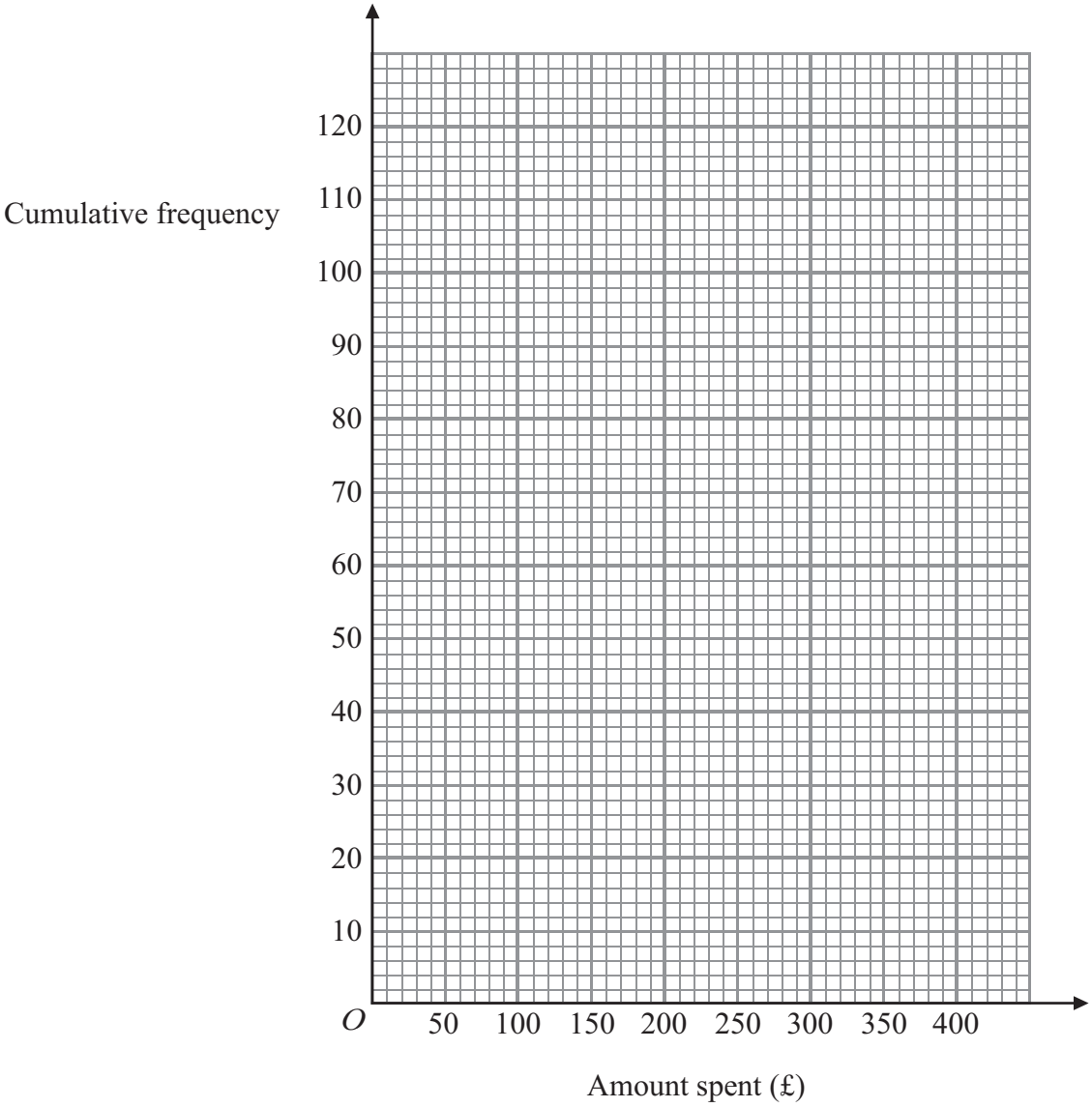
(c) Compare the amounts of money spent by the women with the amounts of money spent by the men.

.....

.....

(1)

blank



Q17

(Total 5 marks)

12. Sethina recorded the times, in minutes, taken to repair 80 car tyres.
Information about these times is shown in the table.

Time (t minutes)	Frequency		
$0 < t \leqslant 6$	15		
$6 < t \leqslant 12$	25		
$12 < t \leqslant 18$	20		
$18 < t \leqslant 24$	12		
$24 < t \leqslant 30$	8		

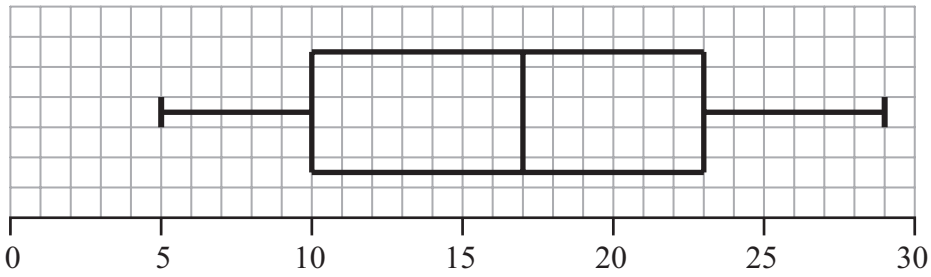
Calculate an estimate for the mean time taken to repair each car tyre.

..... minutes

(Total 4 marks)

Q12

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



(a) Jean says the heaviest bag weighs 23 kg.

She is **wrong**.
Explain why.

.....

.....

(1)

(b) Write down the median weight.

..... kg

(1)

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

..... kg

(1)

There are 240 bags on the plane.

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

.....

(2)

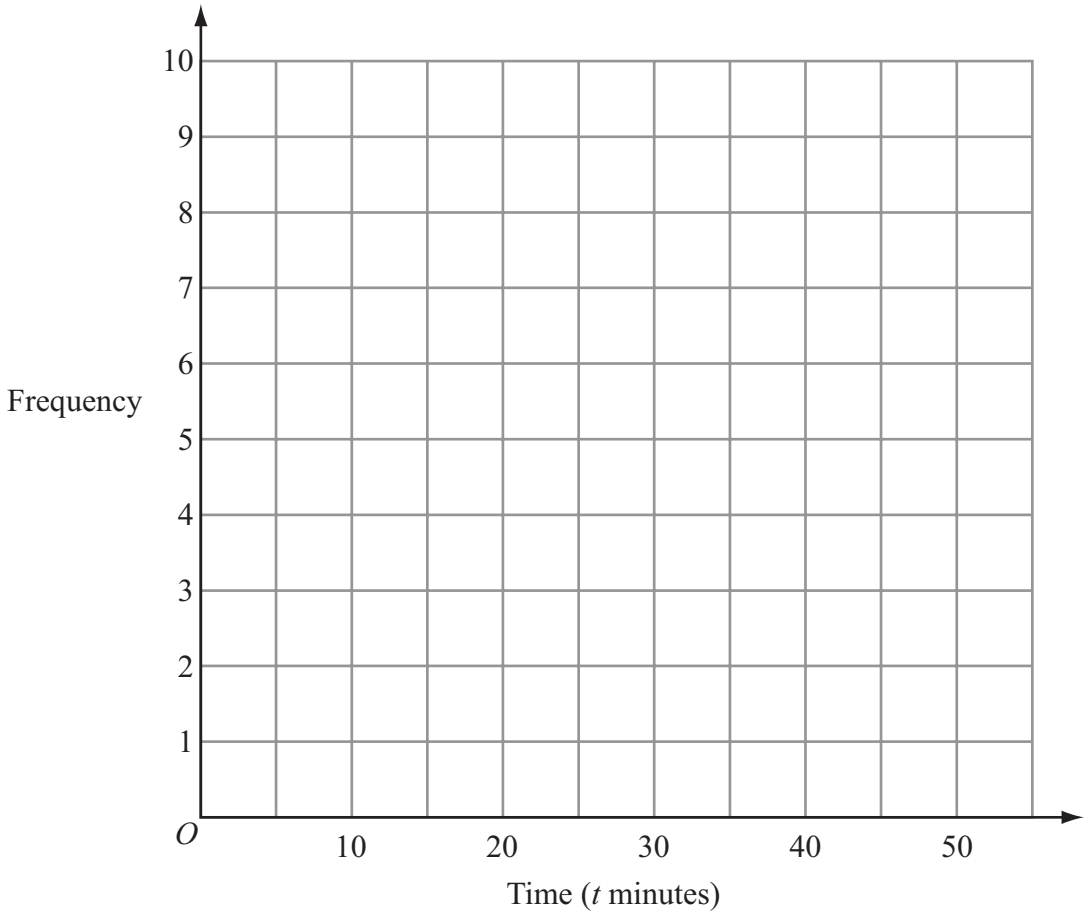
Q18

(Total 5 marks)

6. 30 students took a test.
The table shows information about how long it took them to complete the test.

Time (t minutes)	Frequency
$0 < t \leqslant 10$	5
$10 < t \leqslant 20$	7
$20 < t \leqslant 30$	8
$30 < t \leqslant 40$	6
$40 < t \leqslant 50$	4

(a) On the grid, draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

.....

(1)

Q6

(Total 3 marks)

18. The table shows some information about the heights (h cm) of 100 students.

Height (h cm)	Frequency		
$120 \leqslant h < 130$	8		
$130 \leqslant h < 140$	16		
$140 \leqslant h < 150$	25		
$150 \leqslant h < 160$	30		
$160 \leqslant h < 170$	21		

(a) Find the class interval in which the median lies.

.....

(1)

(b) Work out an estimate for the mean height of the students.

..... cm

(4)

Q18

(Total 5 marks)

8. Sasha carried out a survey of 60 students.
She asked them how many CDs they each have.

This table shows information about the numbers of CDs these students have.

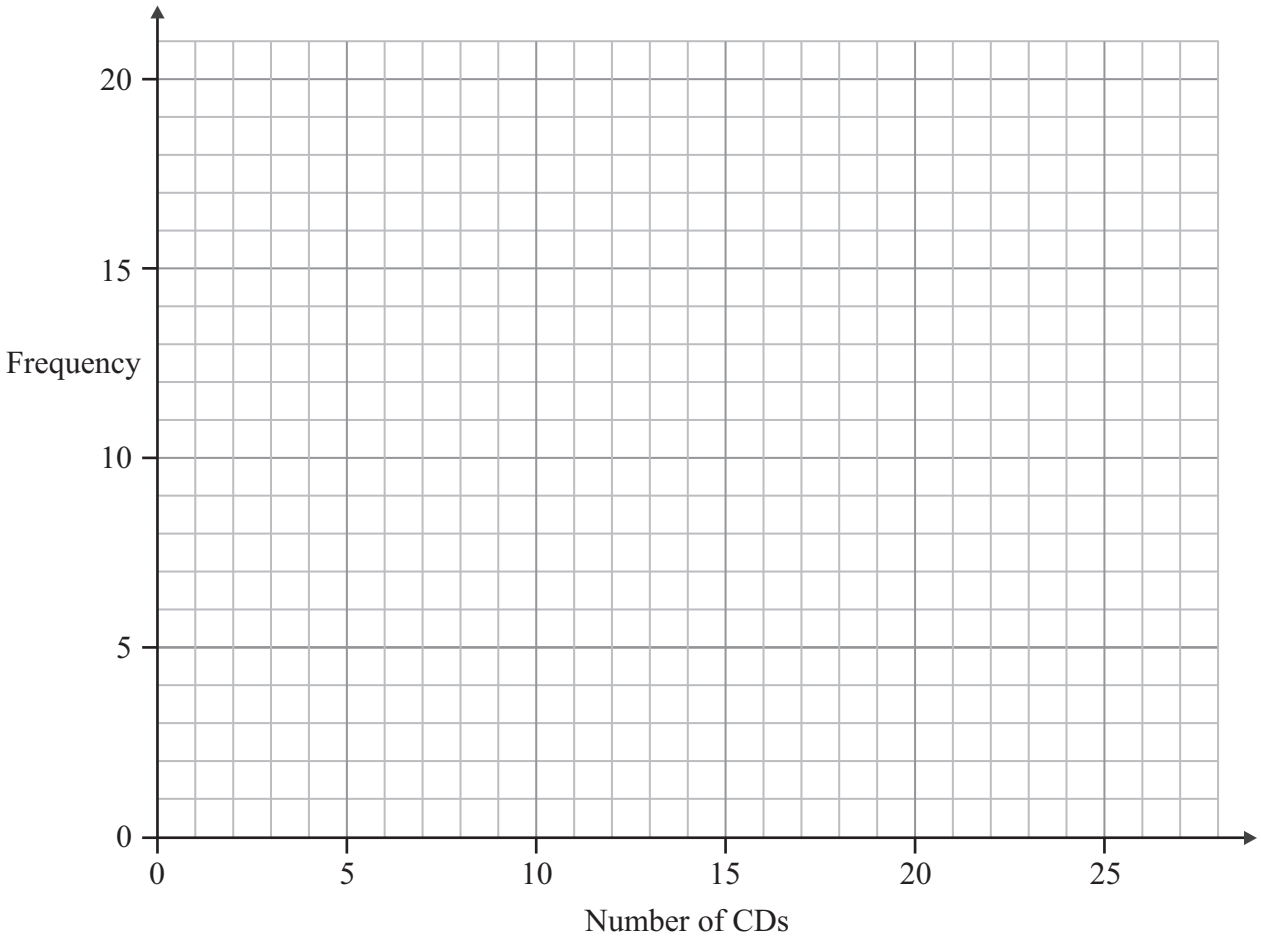
Number of CDs	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24
Frequency	8	11	9	14	18

(a) Write down the class interval containing the median.

.....

(1)

(b) On the grid, draw a frequency polygon to show the information given in the table.



(2)

Q8

(Total 3 marks)

22. The table gives some information about the delays, in minutes, of 80 flights.

Delay (n minutes)	Frequency
$0 < n \leqslant 20$	16
$20 < n \leqslant 30$	26
$30 < n \leqslant 40$	23
$40 < n \leqslant 50$	10
$50 < n \leqslant 60$	5

(a) Write down the modal class interval.

.....

(1)

(b) Complete the cumulative frequency table.

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

(1)

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

(2)

(d) Use your graph to find an estimate for

(i) the median delay,

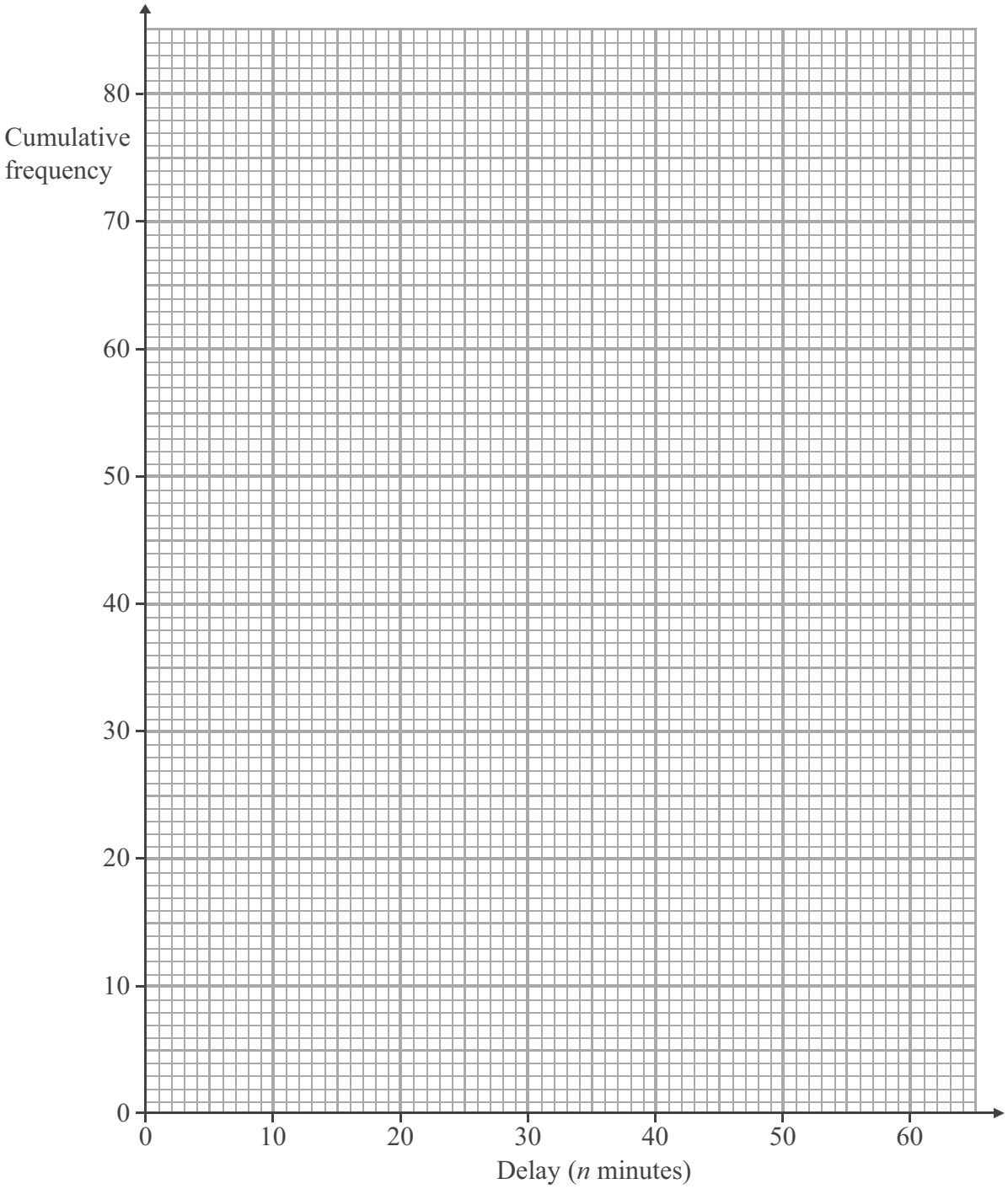
..... minutes

(ii) the interquartile range of the delays.

..... minutes

(3)

blank



Q22

(Total 7 marks)

14. The table gives information about the number of CDs sold in a shop during each of the last 30 weeks.

Number of CDs (n)	Frequency		
$0 < n \leqslant 40$	3		
$40 < n \leqslant 80$	5		
$80 < n \leqslant 120$	12		
$120 < n \leqslant 160$	7		
$160 < n \leqslant 200$	3		

Calculate an estimate for the mean number of CDs sold each week.
Give your answer correct to 1 decimal place.

.....

(Total 4 marks)

Blank

Q14

10. Chris plays golf.

Here are 15 of his scores.

69	78	82	86	77
83	91	77	92	80
74	81	83	77	72

(a) Draw an ordered stem and leaf diagram to show this information.

You must include a key.



Key:

(3)

(b) Write down the mode.

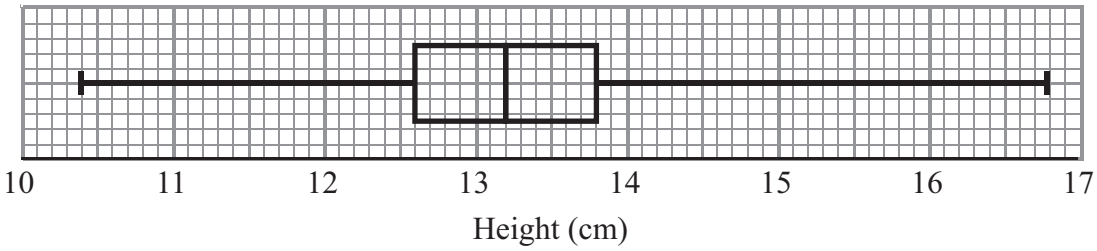
.....

(1)

(Total 4 marks)

Q10

20. Mr Green measured the height, in cm, of each tomato plant in his greenhouse.
He used the results to draw the box plot shown below.



(a) Write down the median height.

.....cm
(1)

(b) Work out the interquartile range.

.....cm
(2)

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

.....

.....

(1)

(Total 4 marks)

Q20

8. The table shows some information about the ages, in years, of 60 people.

Age (in years)	Frequency
0 to 9	6
10 to 19	13
20 to 29	12
30 to 39	9
40 to 49	7
50 to 59	3
60 to 69	10

(a) Write down the modal class.

.....

(1)

Luke says

'The median lies in the class 30 to 39'

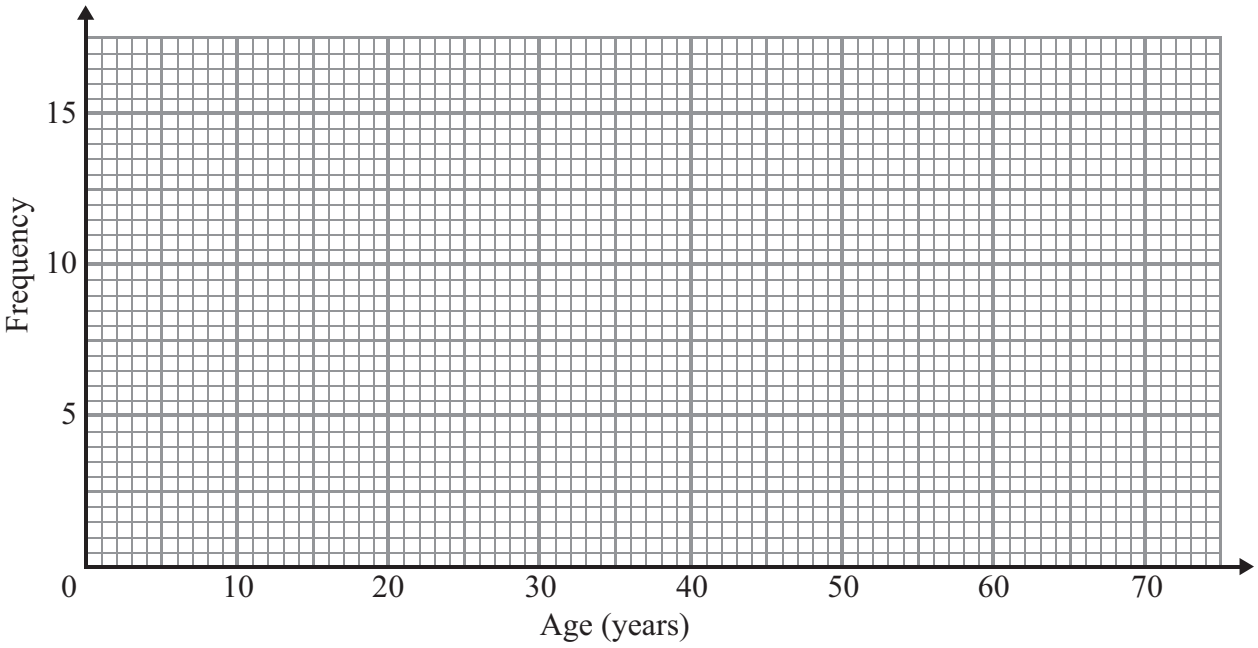
Luke is wrong.

(b) Explain why.

.....

.....

(1)



(c) On the grid, draw a frequency polygon for the information in the table.

(2)

(Total 4 marks)

Q8

19. There are 100 teachers at Maria's school.
Maria found out the age of each teacher.

The table gives information about her results.

Age (A years)	Frequency
$20 < A \leqslant 30$	26
$30 < A \leqslant 40$	35
$40 < A \leqslant 50$	21
$50 < A \leqslant 60$	12
$60 < A \leqslant 70$	6

(a) Complete the cumulative frequency table.

Age (A years)	Cumulative Frequency
$20 < A \leqslant 30$	26
$20 < A \leqslant 40$	
$20 < A \leqslant 50$	
$20 < A \leqslant 60$	
$20 < A \leqslant 70$	

(1)

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

(2)

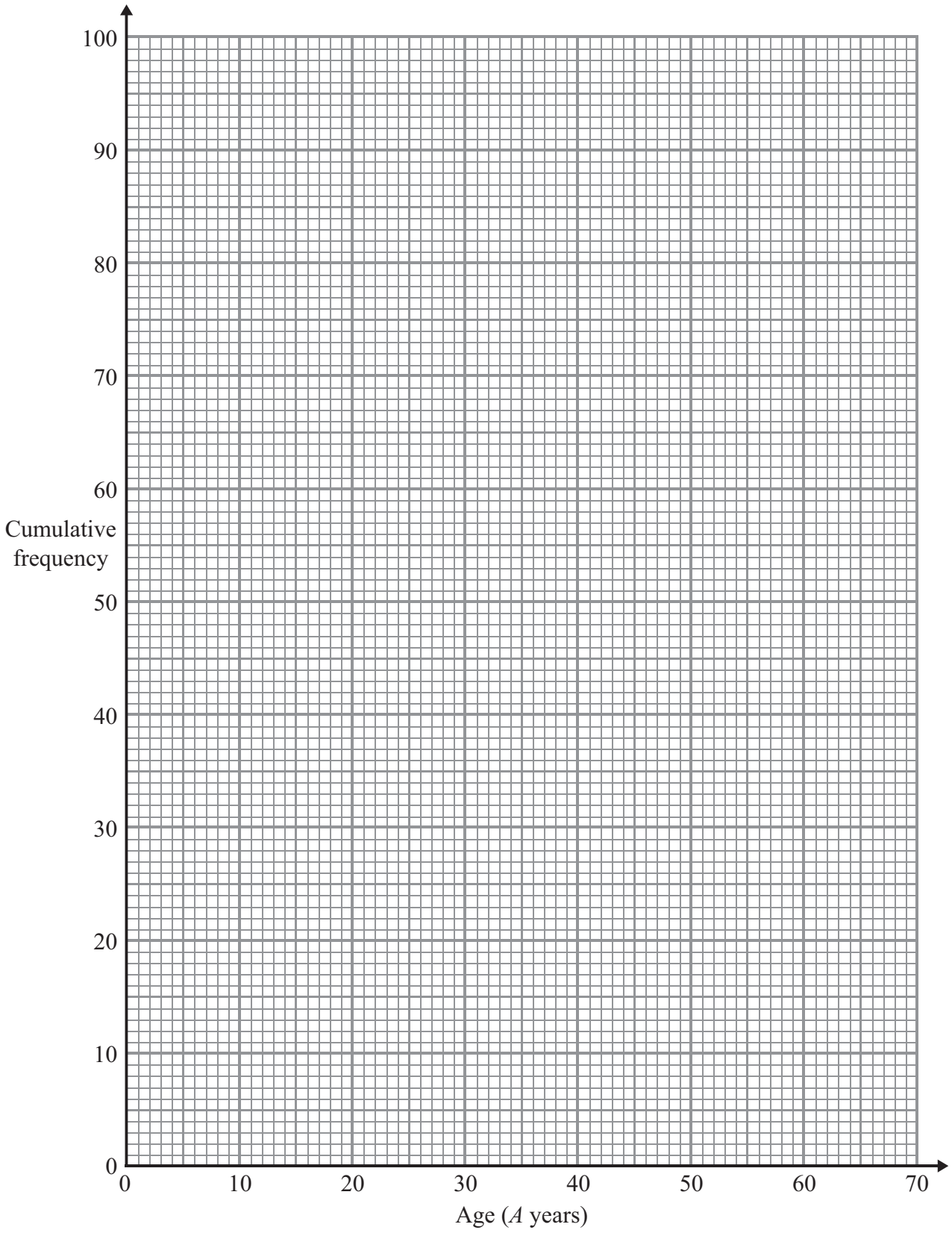
(c) Use your graph to find an estimate for the median age.

..... years
(1)

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

.....
(2)

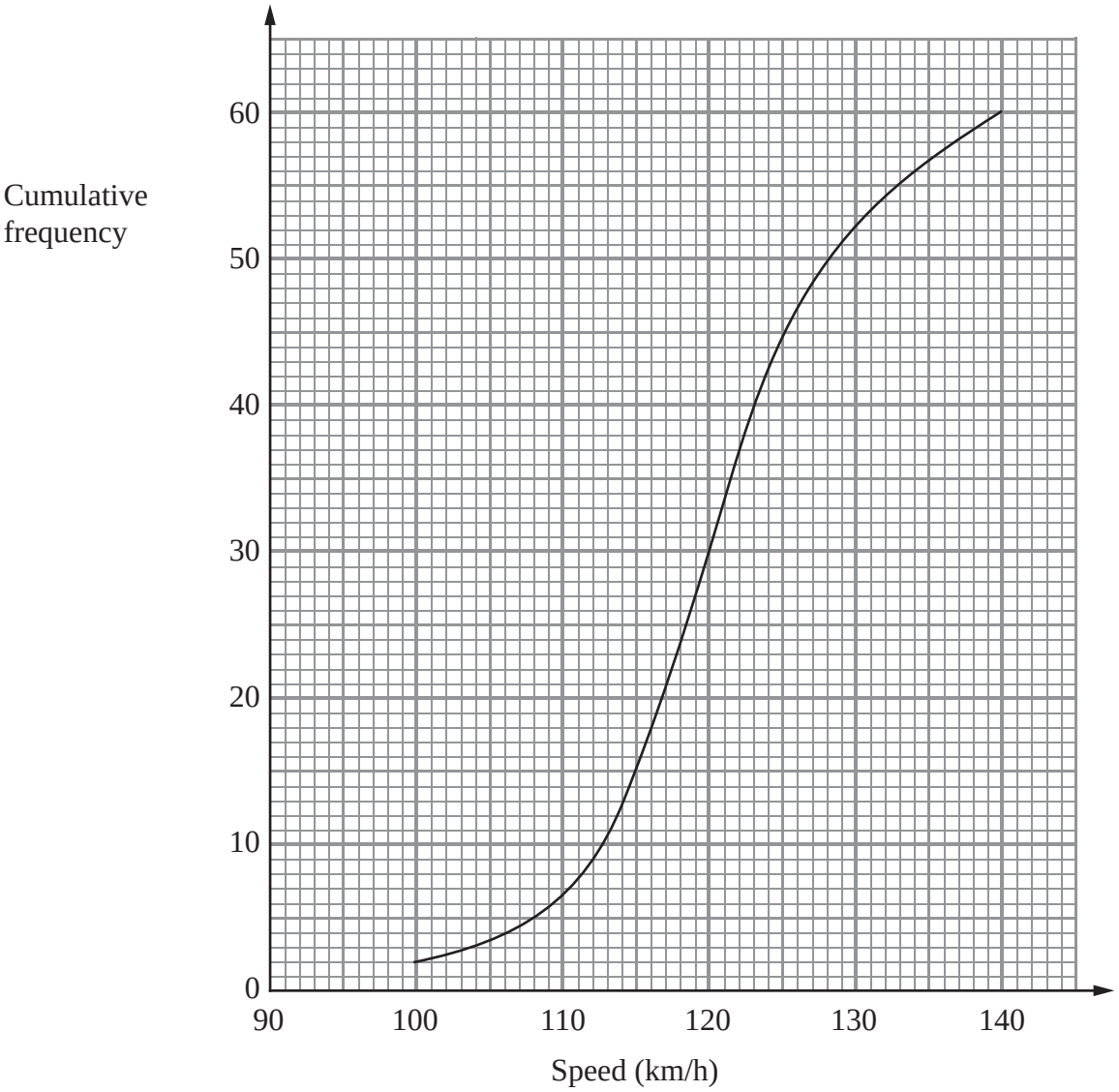
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Q19

(Total 6 marks)

9 The cumulative frequency graph shows information about the speeds of 60 cars on a motorway one Sunday morning.



(a) Use the graph to find an estimate for the median speed.

..... km/h

(1)

The speed limit on this motorway is 130 km/h.
The traffic police say that more than 20% of cars travelling on the motorway break the speed limit.

(b) Comment on what the traffic police say.

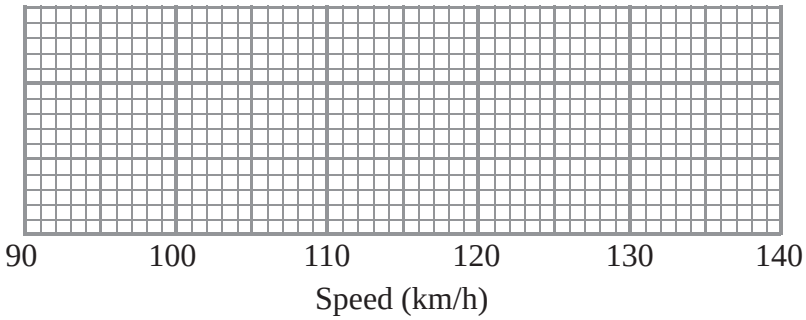
(3)

For these 60 cars

the minimum speed was 97 km/h
and the maximum speed was 138 km/h.

(c) Use the cumulative frequency graph and the information above to draw a box plot showing information about the speeds of the cars.

(3)



(Total for Question 9 is 7 marks)

10 The table gives some information about the weights, in kg, of 50 suitcases at an airport check-in desk.

Weight (w kg)	Frequency
$0 < w \leqslant 10$	16
$10 < w \leqslant 15$	18
$15 < w \leqslant 20$	10
$20 < w \leqslant 35$	6

(a) Work out an estimate for the mean weight.

..... kg

(4)

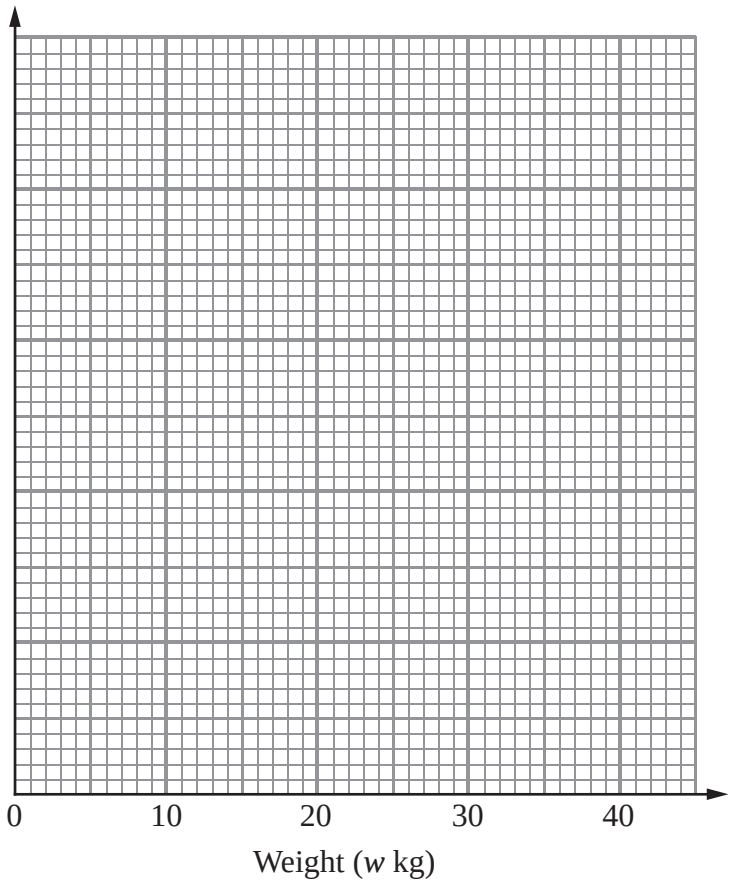
Passengers have to pay extra money for any suitcase that weighs more than 20 kg.
Two of the 50 suitcases are chosen at random.

(b) Work out the probability that both suitcases weigh more than 20 kg.

.....

(2)

(c) On the grid, draw a histogram for the information in the table.



(3)

(Total for Question 10 is 9 marks)

6 There are 15 bags of apples on a market stall.
The mean number of apples in each bag is 9

The table below shows the numbers of apples in **14** of the bags.

Number of apples	Frequency
7	2
8	3
9	3
10	4
11	2

Calculate the number of apples in the 15th bag.

.....

(Total for Question 6 is 3 marks)

7 Kelly recorded the length of time 48 teachers took to travel to school on Monday.

The table shows information about these travel times in minutes.

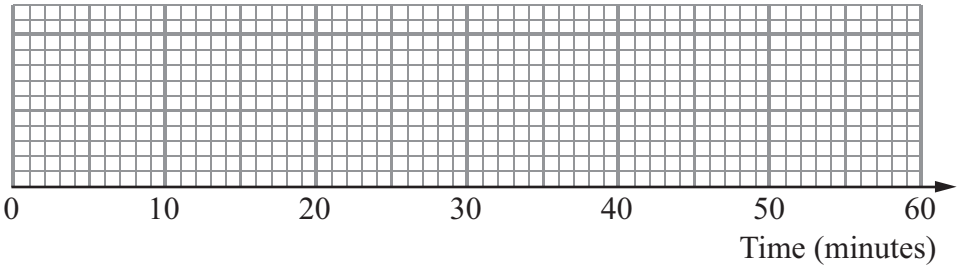
Least time	5
Greatest time	47
Median	28
Lower quartile	18
Upper quartile	35

(a) Work out the number of teachers with a travel time of 35 minutes or more.

.....

(2)

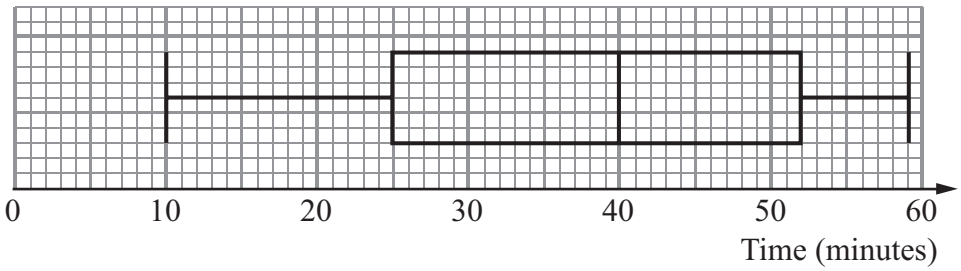
(b) On the grid, draw a box plot to show the information in the table.



(2)

Kelly then recorded the times the same 48 teachers took to travel to school on Tuesday.

The box plot shows some information about these times.



(c) Compare the travel times on Monday and on Tuesday.

.....

.....

.....

.....

(2)

(Total for Question 7 is 6 marks)

10 The table shows some information about the weights, in grams, of 60 eggs.

Weight (w grams)	Frequency		
$0 < w \leqslant 30$	0		
$30 < w \leqslant 50$	14		
$50 < w \leqslant 60$	16		
$60 < w \leqslant 70$	21		
$70 < w \leqslant 100$	9		

(a) Calculate an estimate for the mean weight of an egg.

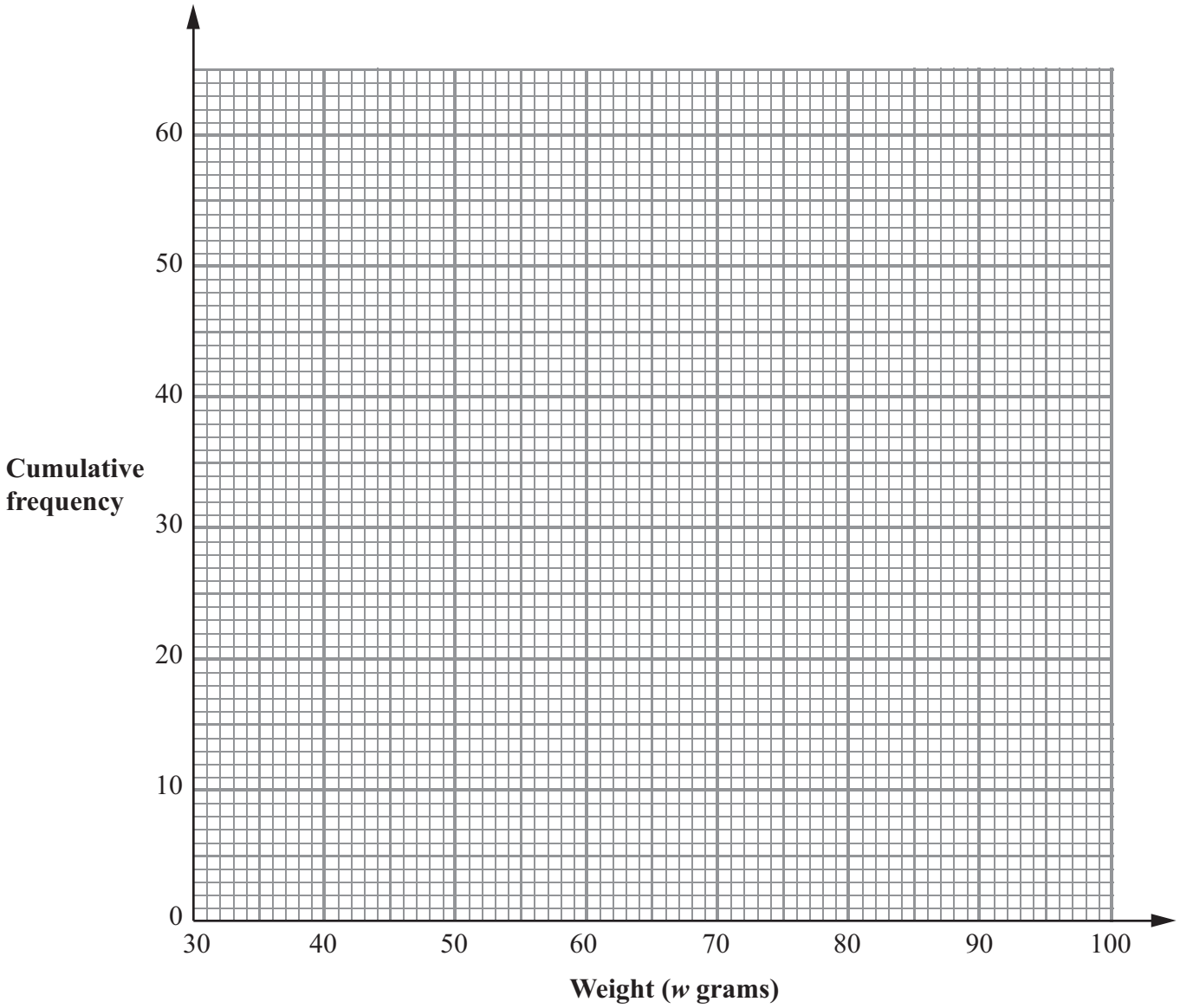
..... g

(4)

(b) Complete the cumulative frequency table.

Weight (w grams)	Cumulative frequency
$0 < w \leqslant 30$	0
$0 < w \leqslant 50$	
$0 < w \leqslant 60$	
$0 < w \leqslant 70$	
$0 < w \leqslant 100$	

(1)



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

(2)

(d) Use your graph to find an estimate for the number of eggs with a weight greater than 63 grams.

.....

(2)

(Total for Question 10 is 9 marks)

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

Time (m minutes)	Frequency
$70 < m \leqslant 80$	4
$80 < m \leqslant 90$	12
$90 < m \leqslant 100$	34
$100 < m \leqslant 110$	32
$110 < m \leqslant 120$	26
$120 < m \leqslant 130$	12

(a) Write down the modal class interval.

.....

(1)

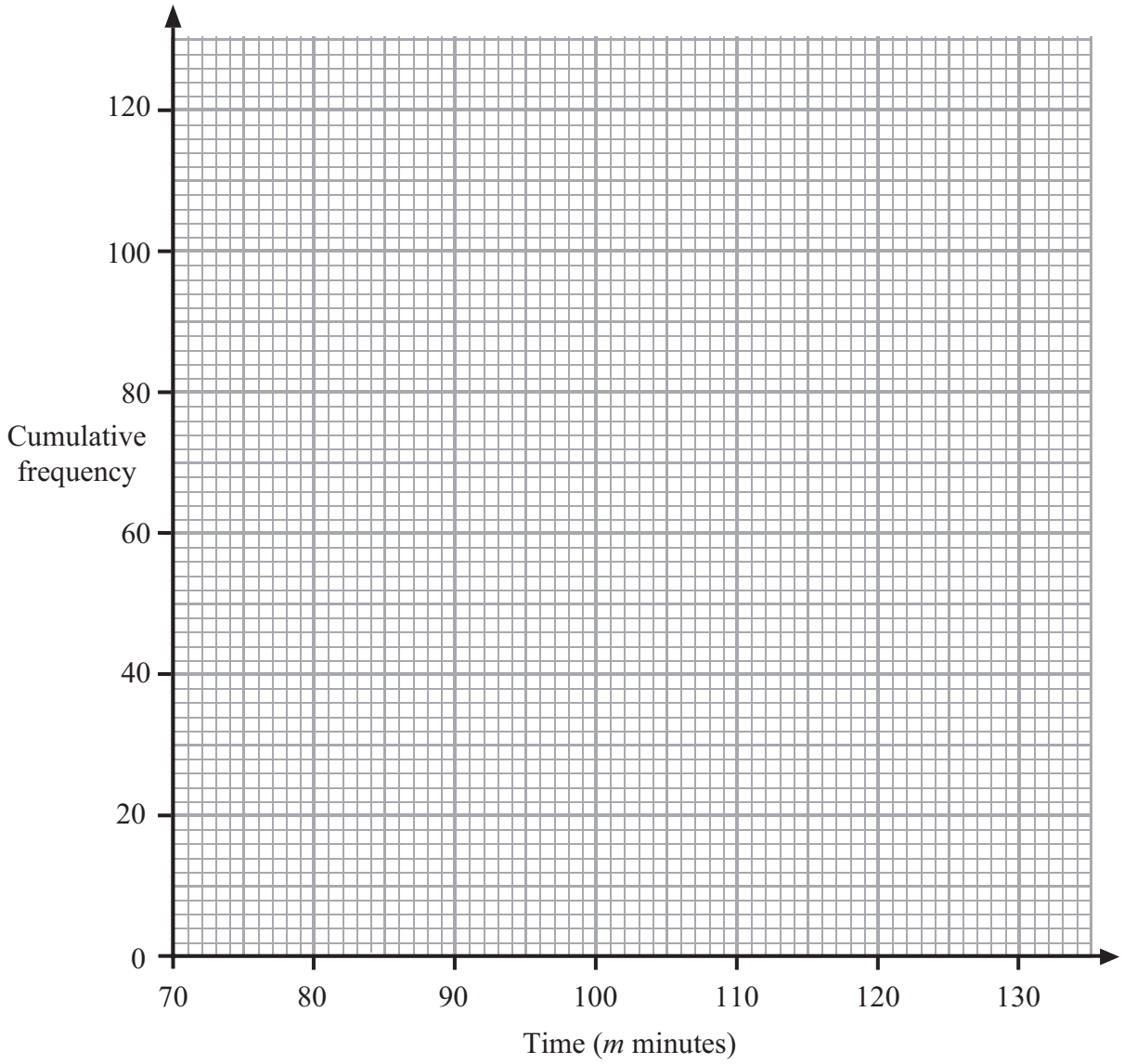
(b) Complete the cumulative frequency table.

Time (m minutes)	Cumulative frequency
$70 < m \leqslant 80$	4
$70 < m \leqslant 90$	
$70 < m \leqslant 100$	
$70 < m \leqslant 110$	
$70 < m \leqslant 120$	
$70 < m \leqslant 130$	

(1)

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



(2)

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

..... minutes

(1)

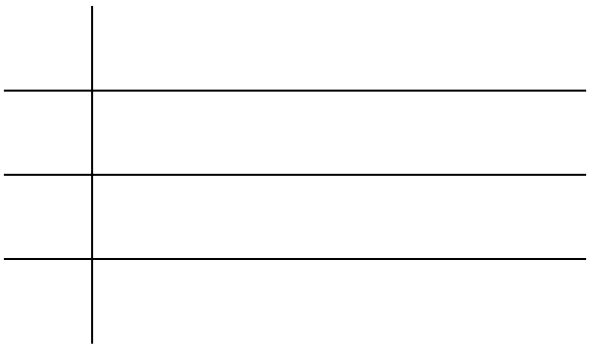
Q18

(Total 5 marks)

6. Here are the ages, in years, of 16 people.

36	48	18	25	36	28	45	30
38	27	41	16	36	48	28	21

(a) Draw an ordered stem and leaf diagram to show this information.
You must include a key.



Key:

(3)

(b) Find the median age.

..... years
(2)

Q6

(Total 5 marks)

11. Bianca asked 32 women about the number of children they each had.

The table shows information about her results.

Number of children	Frequency	
0	9	
1	6	
2	7	
3	8	
4	2	
more than 4	0	

(a) Find the mode.

.....

(1)

(b) Calculate the mean.

.....

(3) **Q11**

(Total 4 marks)

8 The table shows information about midday temperatures.

Temperature (t °C)	Number of days
$10 \leqslant t < 15$	6
$15 \leqslant t < 20$	4
$20 \leqslant t < 25$	24
$25 \leqslant t < 30$	44
$30 \leqslant t < 35$	10
$35 \leqslant t < 40$	4

(a) Write down the modal class interval.

.....

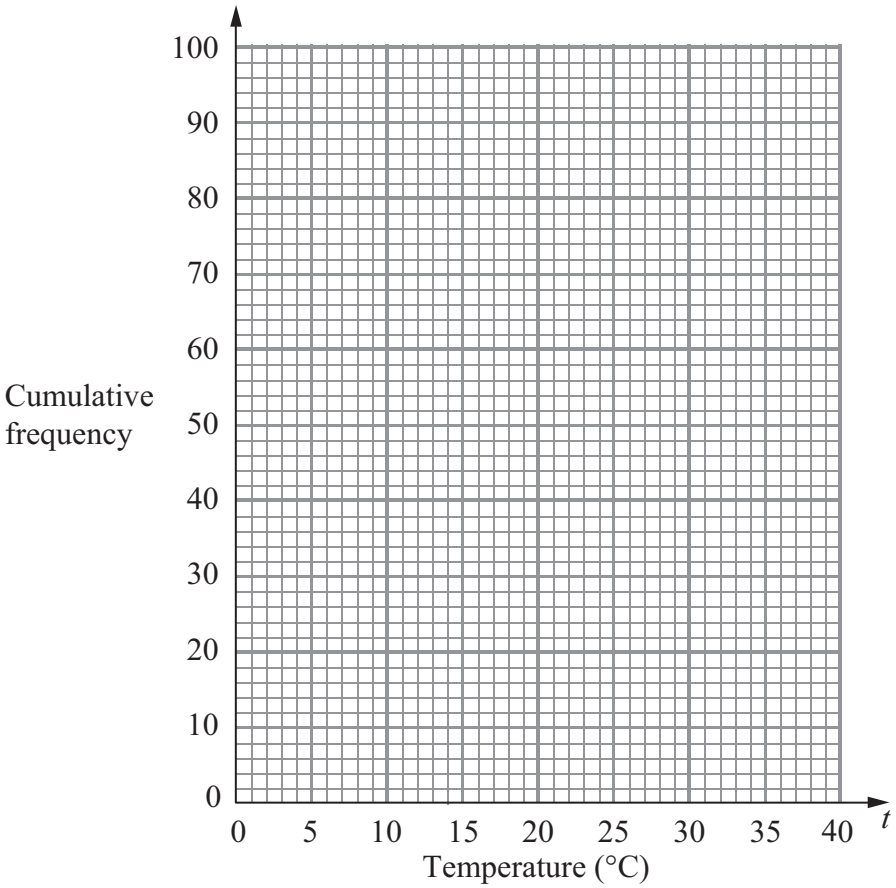
(1)

(b) Work out an estimate for the mean midday temperature.
Give your answer correct to 3 significant figures.

..... °C

(4)

(c) On the grid opposite, draw a cumulative frequency graph for the information from the table about the midday temperatures.



(3)

(d) Find estimates for the median **and** the interquartile range of these midday temperatures.

Median ..... °C

Interquartile range ..... °C

(3)

(Total for Question 8 is 11 marks)

4. Jim did a survey on the lengths of caterpillars he found on a field trip.

Information about the lengths is given in the stem and leaf diagram.

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

Key: 5|2 means 5.2 cm

Work out the median.

..... cm

(Total 2 marks)

Q4

15. A garage keeps records of the costs of repairs to customers' cars.

The table gives information about these costs for one month.

Cost (£C)	Frequency
$0 < C \leqslant 200$	7
$200 < C \leqslant 400$	11
$400 < C \leqslant 600$	9
$600 < C \leqslant 800$	10
$800 < C \leqslant 1000$	8
$1000 < C \leqslant 1200$	5

(a) Write down the modal class interval.

.....

(1)

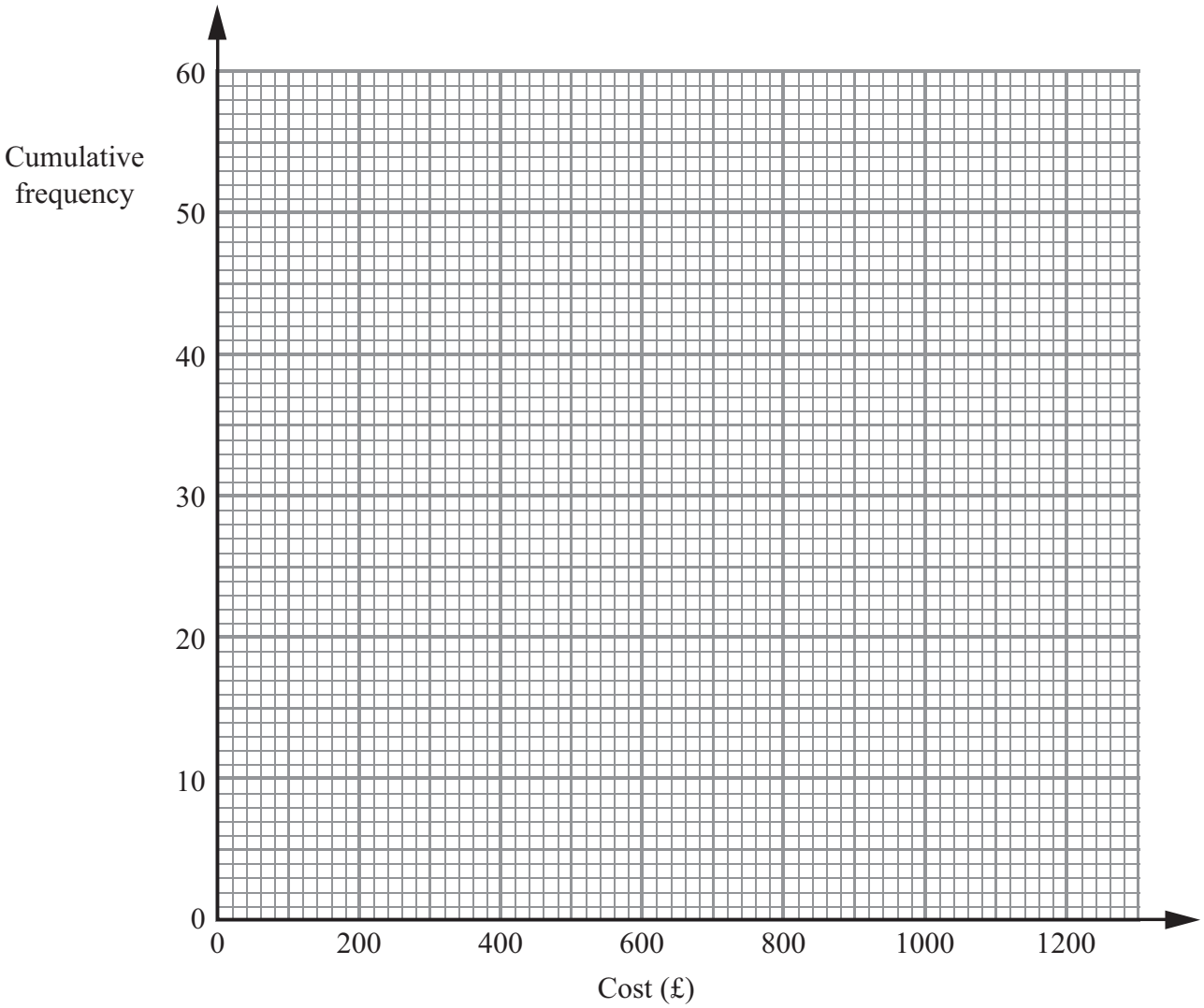
(b) Complete the cumulative frequency table.

Cost (£C)	Cumulative Frequency
$0 < C \leqslant 200$	
$0 < C \leqslant 400$	
$0 < C \leqslant 600$	
$0 < C \leqslant 800$	
$0 < C \leqslant 1000$	
$0 < C \leqslant 1200$	

(1)

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

blank



(2)

(d) Use the graph to find an estimate for the number of repairs which cost more than £700

.....

(2)

Q15

(Total 6 marks)

10. The temperature (T°C) at noon at a seaside resort was recorded for a period of 60 days. The table shows some of this information.

Temperature (T°C)	Number of days
$10 < T \leqslant 14$	2
$14 < T \leqslant 18$	8
$18 < T \leqslant 22$	14
$22 < T \leqslant 26$	23
$26 < T \leqslant 30$	9
$30 < T \leqslant 34$	4

Calculate an estimate for the mean temperature at noon during these 60 days.
Give your answer correct to 3 significant figures.

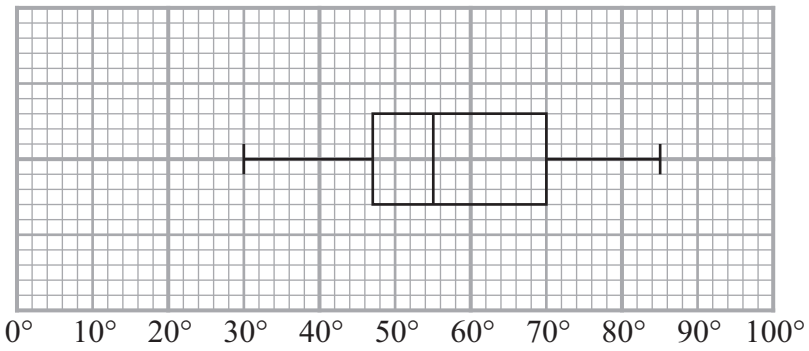
.....°C

(Total 4 marks)

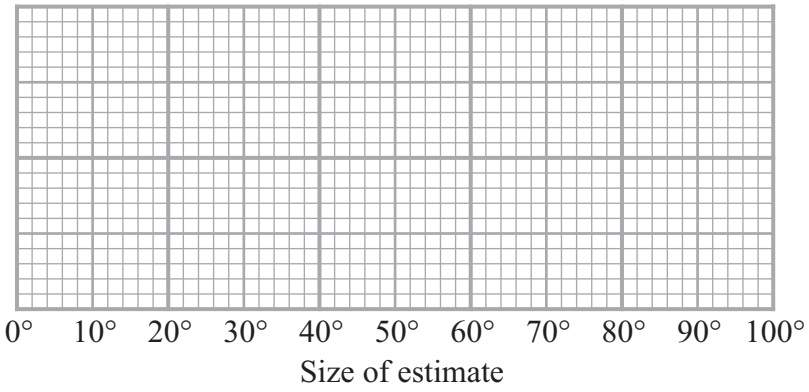
Q10

16. Barry drew an angle of 60°.
He asked some children to estimate the size of the angle 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.

..... °

(1)

(b) Find the interquartile range of the children's estimates.

..... °

(2)

blank

Barry then asked some adults to estimate the size of the angle he had drawn.
The table gives some information about the adults' estimates.

	Angle
Lowest estimate	20°
Lower quartile	45°
Median	62°
Upper quartile	75°
Highest estimate	95°

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

(2)

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

.....

.....

.....

.....

(2)

(Total 7 marks)

Q16

Question 34

3 Julie is x years old.
Kevin is $x + 3$ years old.
Omar is $2x$ years old.

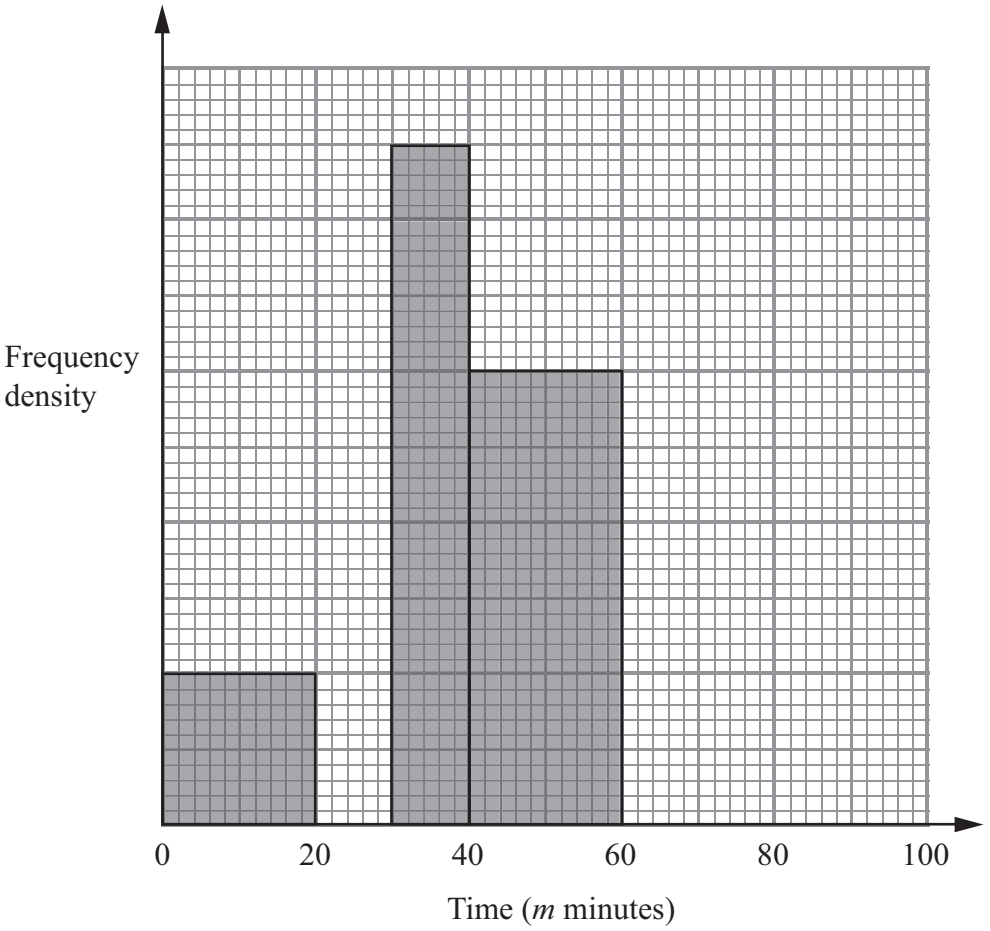
Write an expression, in terms of x, for the mean of their ages.

.....

(Total for Question 3 is 2 marks)

12 The table and the histogram show some information about the time, in minutes, taken by a group of students to travel to college in one week.

Time (m minutes)	Frequency
$0 < m \leqslant 20$	20
$20 < m \leqslant 30$	30
$30 < m \leqslant 40$	
$40 < m \leqslant 60$	
$60 < m \leqslant 100$	48



(a) Use the histogram to complete the table.

(2)

(b) Use the table to complete the histogram.

(2)

(c) Work out an estimate for the median time.

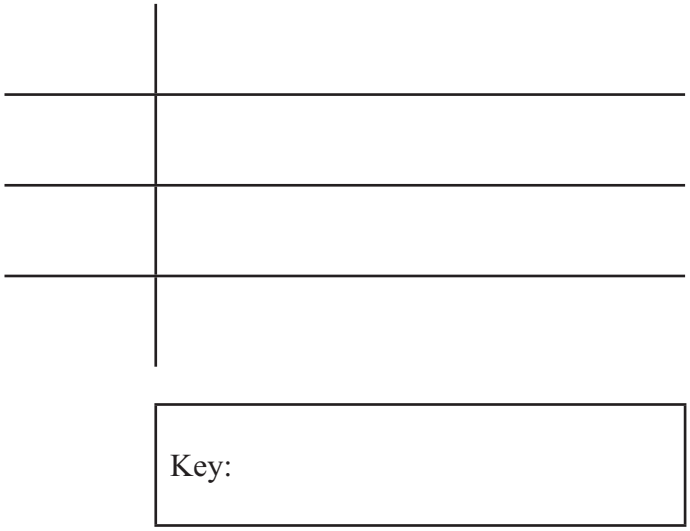
..... minutes
(2)

(Total for Question 12 is 6 marks)

5 Here are the heights, in cm, of 20 sunflower plants.

73	84	78	96	98	84	101	93	71	104
81	92	95	103	100	96	87	91	88	96

(a) Draw an ordered stem and leaf diagram for these heights.



Key:

(3)

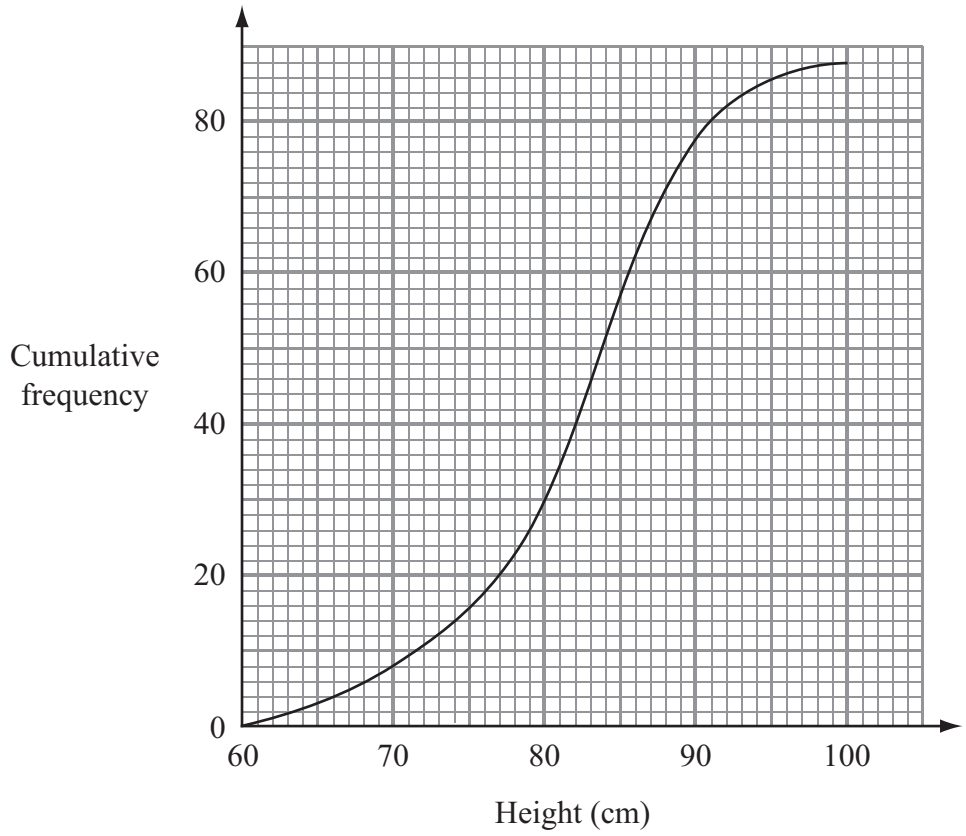
(b) Find the median height.

..... cm

(1)

(Total for Question 5 is 4 marks)

8 The cumulative frequency graph shows information about the heights of some hollyhock plants.



(a) Find an estimate for the median height.

..... cm

(1)

(b) Work out an estimate for the interquartile range.

..... cm

(2)

(c) Find an estimate for the number of hollyhock plants taller than 90 cm.

.....

(2)

(Total for Question 8 is 5 marks)

10 Daniela works in a shop.

Daniela served 50 customers in the morning.
She served 75 customers in the afternoon.

The mean time to serve 50 customers in the morning was 48.7 seconds.
The mean time to serve all 125 customers was 50.2 seconds.

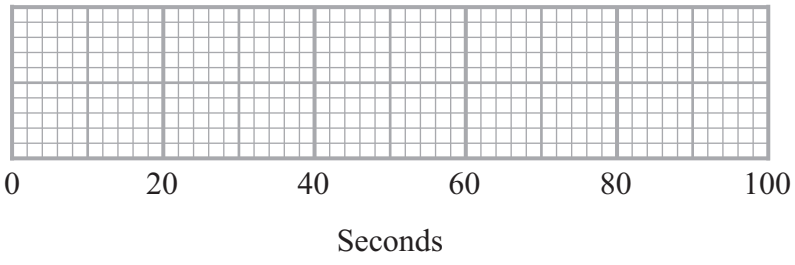
(a) Work out the mean time to serve the 75 customers in the afternoon.

..... seconds
(3)

For the 75 customers served in the afternoon

the least time was 18 seconds
the greatest time was 96 seconds
the median time was 56 seconds
the lower quartile was 32 seconds
the upper quartile was 72 seconds

(b) On the grid, draw a box plot for this information.



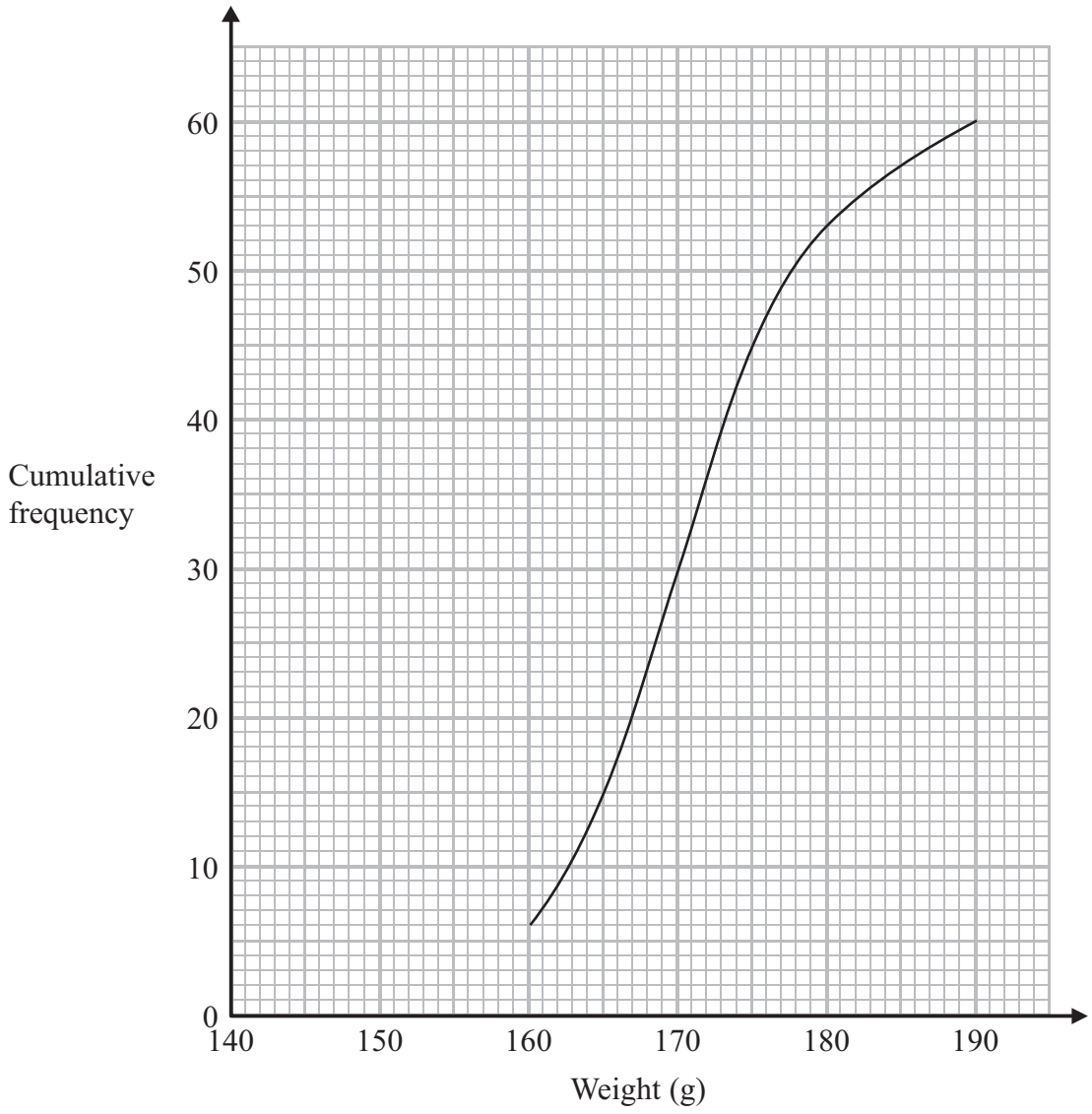
(3)

(Total for Question 10 is 6 marks)

15 Harry grows tomatoes.
This year he put his tomato plants into two groups, group A and group B.

Harry gave fertiliser to the tomato plants in group A.
He did not give fertiliser to the tomato plants in group B.

Harry weighed 60 tomatoes from group A.
The cumulative frequency graph shows some information about these weights.

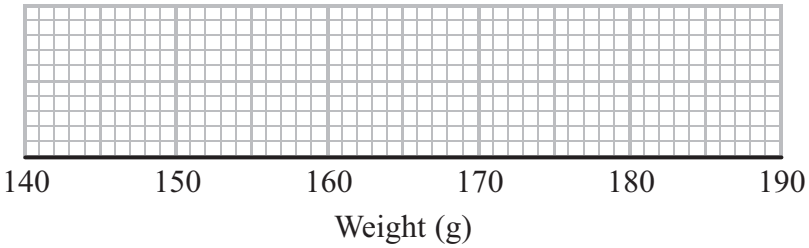


(a) Use the graph to find an estimate for the median weight.

..... g
(1)

The 60 tomatoes from group A
had a minimum weight of 153 grams
and a maximum weight of 186 grams.

(b) Use this information and the cumulative frequency graph to draw a box plot for the 60 tomatoes from group A.

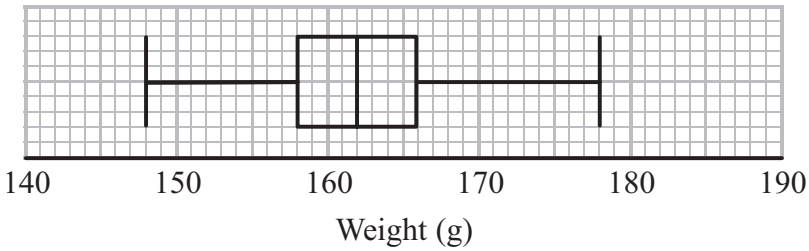


Group A

(3)

Harry did not give fertiliser to the tomato plants in group B.

Harry weighed 60 tomatoes from group B.
He drew this box plot for his results.



Group B

(c) Compare the distribution of the weights of the tomatoes from group A with the distribution of the weights of the tomatoes from group B.

.....

.....

.....

.....

(2)

(Total for Question 15 is 6 marks)

13 Bob asked each of 40 friends how many minutes they took to get to work.

The table shows some information about his results.

Time taken (m minutes)	Frequency
$0 < m \leqslant 10$	3
$10 < m \leqslant 20$	8
$20 < m \leqslant 30$	11
$30 < m \leqslant 40$	9
$40 < m \leqslant 50$	9

Work out an estimate for the mean time taken.

..... minutes

(Total for Question 13 is 4 marks)

***15** Henry is thinking about having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter	**No Water Meter**
A charge of £28.20 per year **plus** 91.22p for every cubic metre of water used **1 cubic metre = 1000 litres**	A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Henry wants to pay as little as possible for the water he uses.
Should Henry have a water meter?

(Total for Question 15 is 5 marks)

Question 42

5 Jamal plays 15 games of ten-pin bowling.

Here are his scores.

72	59	75	66	79
75	66	63	89	76
65	79	77	71	83

(a) Draw an ordered stem and leaf diagram to show Jamal's scores.

(3)

Gill plays 15 games of ten-pin bowling.

The table gives some information about her scores.

Highest score	95
Lowest score	75
Mean score	80

*(b) Compare the distribution of Jamal's scores and the distribution of Gill's scores.

(5)

(Total for Question 5 is 8 marks)

6 The table gives information about the speeds of 75 cars on a road.

Speed (s km/h)	Frequency		
$30 \leqslant s < 40$	7		
$40 \leqslant s < 50$	22		
$50 \leqslant s < 60$	34		
$60 \leqslant s < 70$	12		

Work out an estimate for the mean speed.

..... km/h

(Total for Question 6 is 4 marks)

Question 44

7 The table shows information about the lengths, in seconds, of 40 TV adverts.

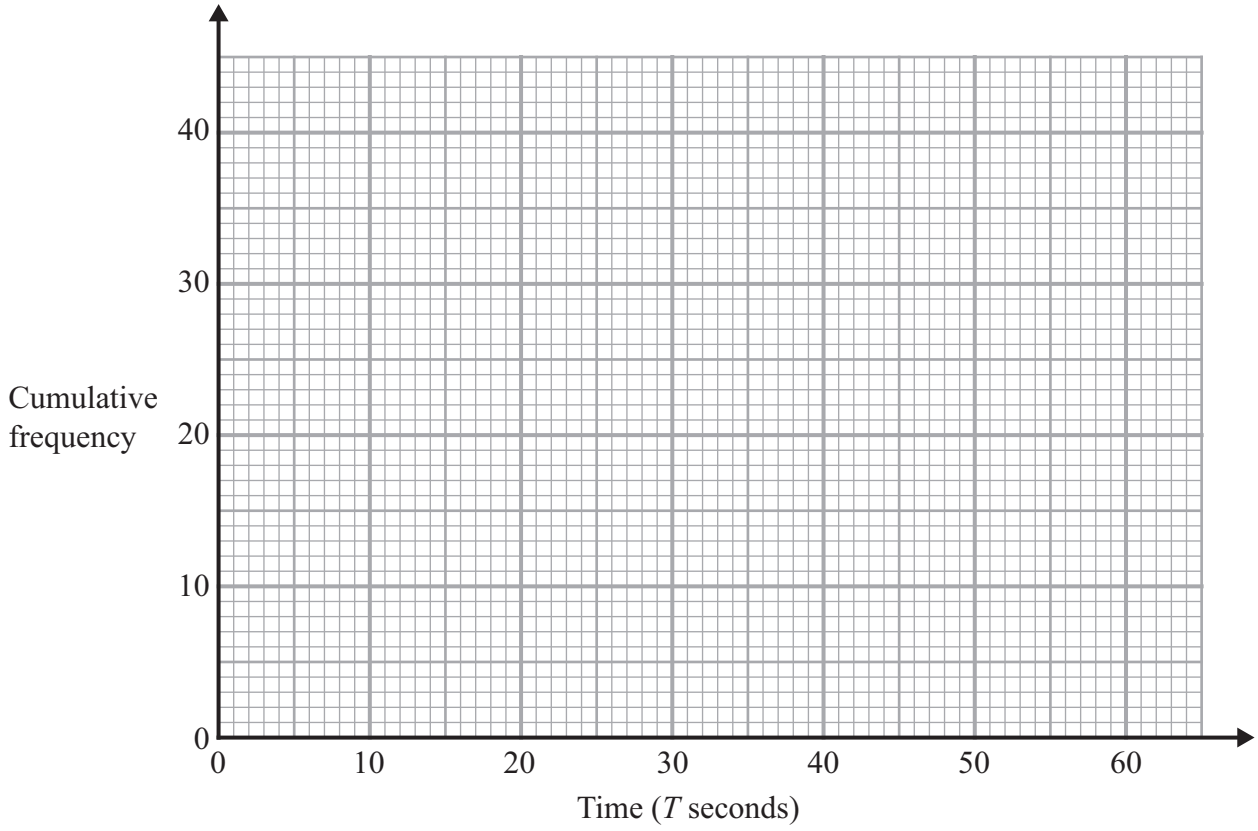
Time (T seconds)	Frequency
$10 < T \leqslant 20$	4
$20 < T \leqslant 30$	7
$30 < T \leqslant 40$	13
$40 < T \leqslant 50$	12
$50 < T \leqslant 60$	4

(a) Complete the cumulative frequency table for this information.

Time (T seconds)	Cumulative frequency
$10 < T \leqslant 20$	4
$10 < T \leqslant 30$	
$10 < T \leqslant 40$	
$10 < T \leqslant 50$	
$10 < T \leqslant 60$	

(1)

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



(2)

(c) Use your graph to find an estimate for the median length of these TV adverts.

..... seconds

(1)

(Total for Question 7 is 4 marks)

8 23 girls have a mean height of 153 cm.
17 boys have a mean height of 165 cm.

Work out the mean height of all 40 children.

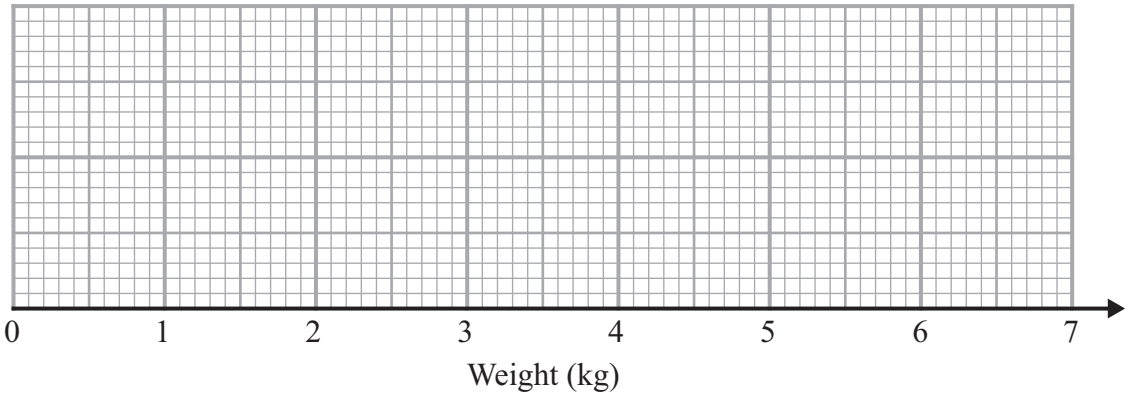
..... cm

(Total for Question 8 is 3 marks)

9 The table gives some information about the weights of 60 babies.

Lowest	2.0 kg
Highest	6.5 kg
Lower quartile	2.8 kg
Upper quartile	4.2 kg
Median	3.0 kg

(a) Draw a box plot to show this information.



(2)

There are 60 babies.

(b) Work out an estimate for the number of these babies with a weight greater than 2.8 kg.

.....

(2)

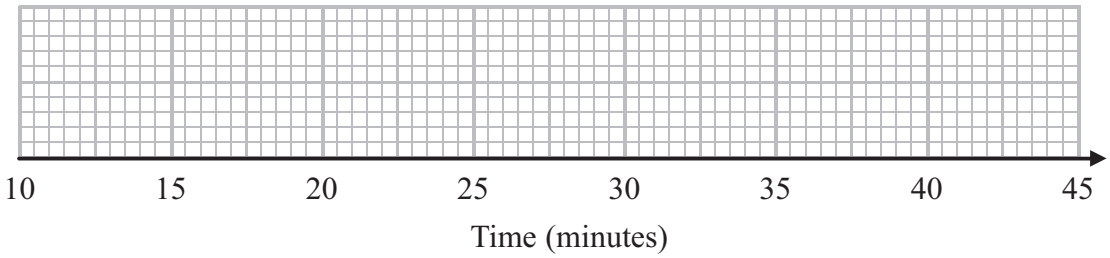
(Total for Question 9 is 4 marks)

19 Sameena recorded the times, in minutes, some girls took to do a jigsaw puzzle.

Sameena used her results to work out the information in this table.

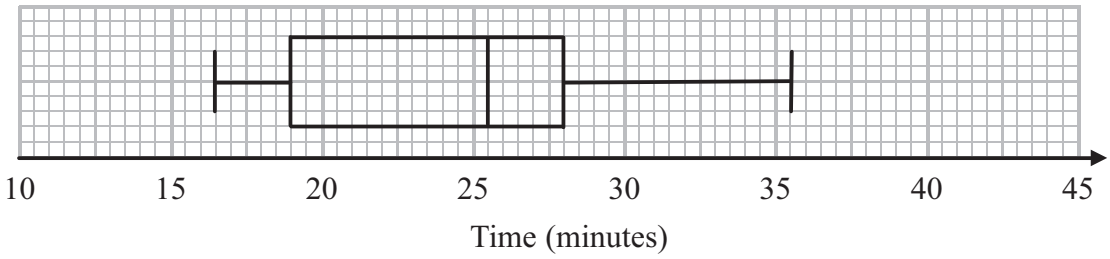
	Minutes
Shortest time	18
Lower quartile	25
Median	29
Upper quartile	33
Longest time	44

(a) On the grid, draw a box plot to show the information in the table.



(2)

The box plot below shows information about the times, in minutes, some boys took to do the same jigsaw puzzle.



(b) Compare the distributions of the girls' times and the boys' times.

.....

.....

.....

.....

(2)

(Total for Question 19 is 4 marks)

9 The stem and leaf diagram gives information about the numbers of tomatoes on 31 tomato plants.

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

Key: 5 | 7 = 57 tomatoes

(a) Work out the median.

.....

(1)

(b) Work out the interquartile range.

.....

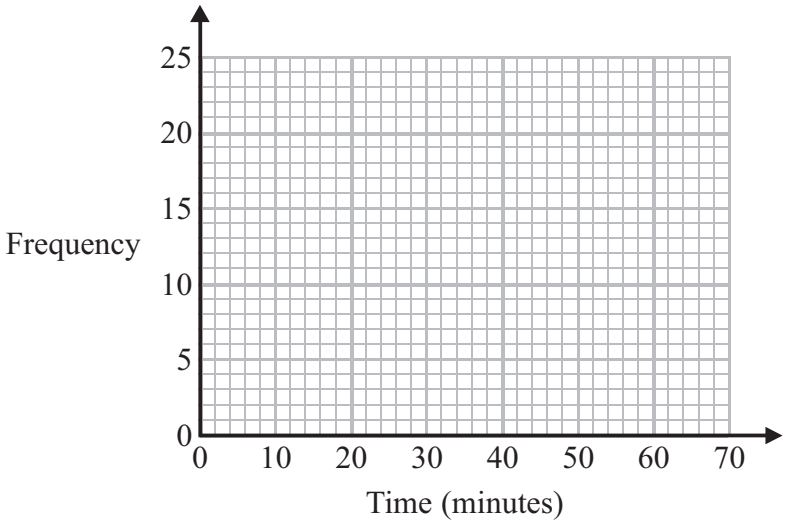
(2)

(Total for Question 9 is 3 marks)

12 The frequency table gives information about the times it took some office workers to get to the office one day.

Time (t minutes)	Frequency
$0 < t \leqslant 10$	4
$10 < t \leqslant 20$	8
$20 < t \leqslant 30$	14
$30 < t \leqslant 40$	16
$40 < t \leqslant 50$	6
$50 < t \leqslant 60$	2

(a) Draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

.....

(1)

One of the office workers is chosen at random.

(c) Work out the probability that this office worker took more than 40 minutes to get to the office.

.....

(2)

(Total for Question 12 is 5 marks)

3 Faisel weighed 50 pumpkins.

The grouped frequency table gives some information about the weights of the pumpkins.

Weight (w kilograms)	Frequency
$0 < w \leqslant 4$	11
$4 < w \leqslant 8$	23
$8 < w \leqslant 12$	14
$12 < w \leqslant 16$	2

Work out an estimate for the mean weight.

..... kg

(Total for Question 3 is 4 marks)

10 5 female giraffes have a mean weight of x kg.
7 male giraffes have a mean weight of y kg.

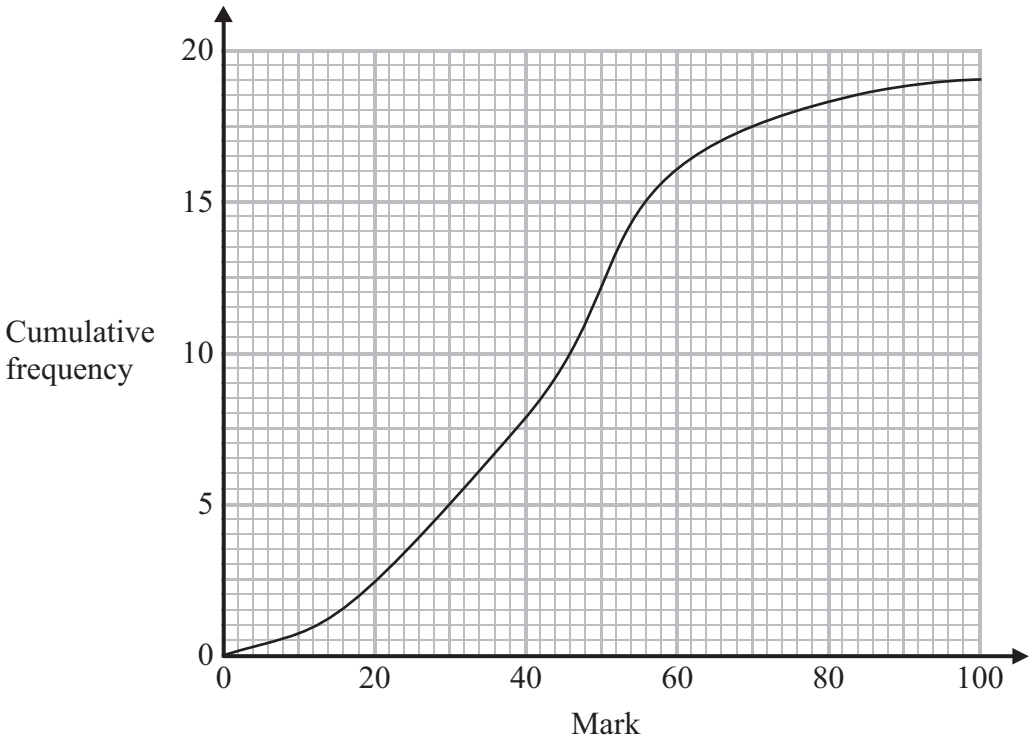
Write down an expression, in terms of x and y, for the mean weight of all 12 giraffes.

.....

(Total for Question 10 is 2 marks)

14 Mrs Angus's class did a maths test.

The cumulative frequency graph shows information about their marks.



(a) Use the cumulative frequency graph to find

(i) the median,

.....

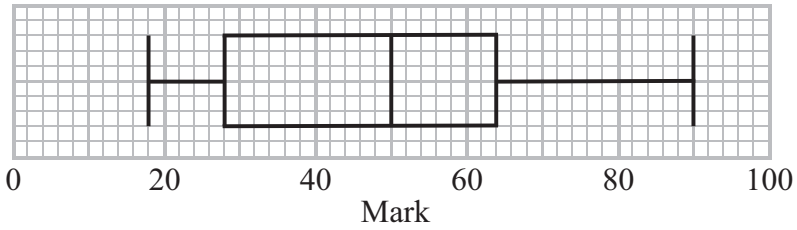
(ii) the interquartile range.

.....

(3)

Mr Wilson's class did the same maths test.

The box plot shows information about their marks.



*(b) Compare the interquartile range of the marks of Mr Wilson's class with the interquartile range of the marks of Mrs Angus's class.

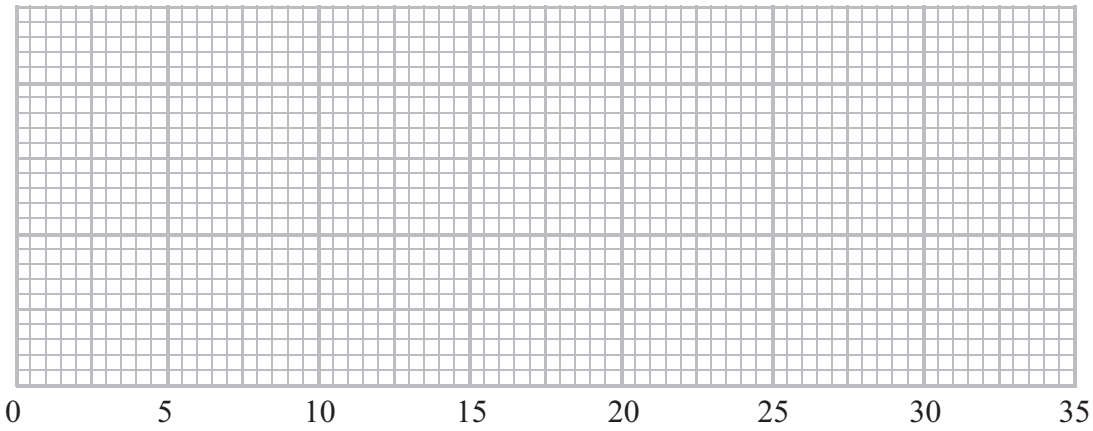
(2)

(Total for Question 14 is 5 marks)

8 The table below shows information about the times, in minutes, a group of students took to answer 10 maths questions.

	Least	Lower quartile	Median	Upper quartile	Greatest
Time in minutes	14	18	20	25	30

On the grid below, draw a box plot to show the information in the table.



(Total for Question 8 is 3 marks)

***9** There are two trays of plants in a greenhouse.
The first tray of plants was given fertiliser.
The second tray of plants was not given fertiliser.

On Monday the heights of the plants were measured in centimetres.
The boxes show some information about the heights of the plants.

Heights of the plants given fertiliser

22	29	30	35	37	40	44	47
48	48	54	56	59	66	72	

Information about the heights of plants not given fertiliser

Smallest	18	Lower quartile	26
Largest	64	Upper quartile	47
Median	44		

Compare the distribution of the heights of the plants given fertiliser to the distribution of the heights of the plants not given fertiliser.

(Total for Question 9 is 4 marks)

10 The table shows information about the ages of 90 employees in a factory.

Age (a years)	Frequency
$15 < a \leqslant 25$	12
$25 < a \leqslant 35$	27
$35 < a \leqslant 45$	18
$45 < a \leqslant 55$	23
$55 < a \leqslant 65$	10

(a) Calculate an estimate for the mean age.

.....years

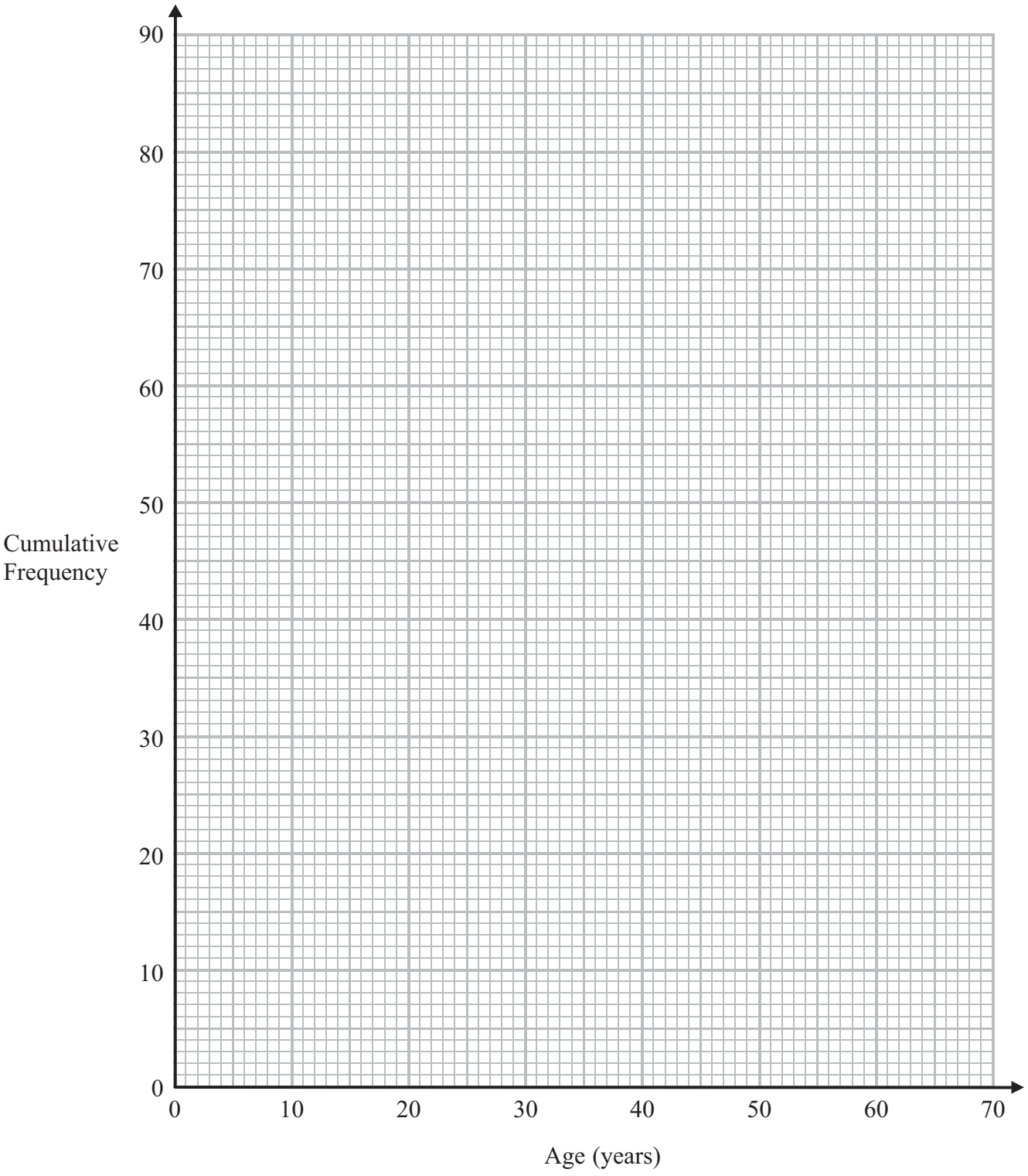
(4)

(b) Complete the cumulative frequency table.

Age (a years)	Cumulative Frequency
$15 < a \leqslant 25$	
$15 < a \leqslant 35$	
$15 < a \leqslant 45$	
$15 < a \leqslant 55$	
$15 < a \leqslant 65$	

(1)

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



(2)

(d) Find an estimate for

(i) the median age,

.....years

(ii) the number of the employees over the age of 50

.....

(3)

(Total for Question 10 is 10 marks)

6 Ed has 4 cards.
There is a number on each card.



The mean of the 4 numbers on Ed's cards is 10

Work out the number on the 4th card.

.....

(Total for Question 6 is 3 marks)

8 Margaret has some goats.
The goats produce an average total of 21.7 litres of milk per day for 280 days.
Margaret sells the milk in $\frac{1}{2}$ litre bottles.

Work out an estimate for the total number of bottles that Margaret will be able to fill with the milk.

You must show clearly how you got your estimate.

.....

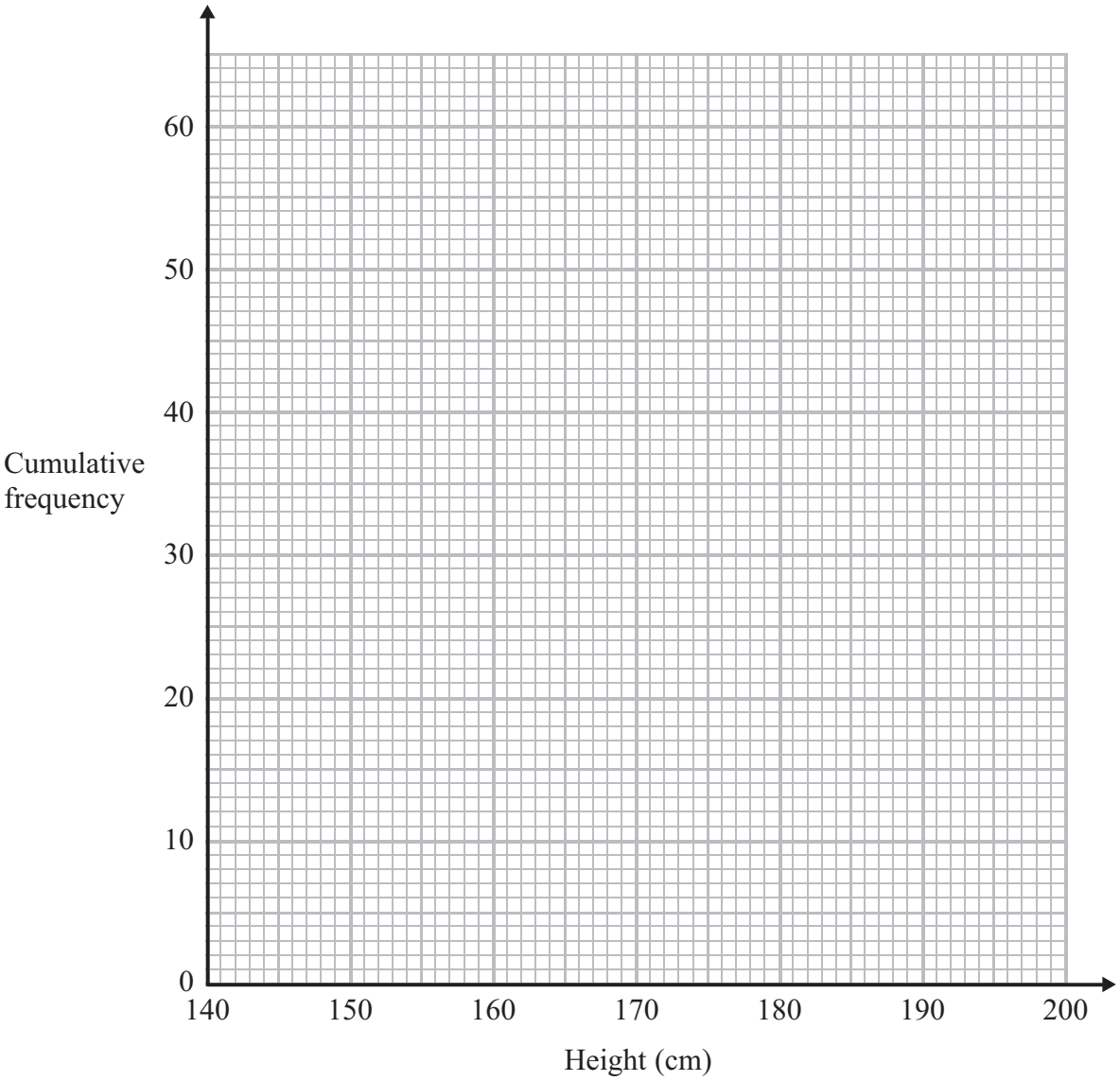
(Total for Question 8 is 3 marks)

21 The table below shows information about the heights of 60 students.

Height (x cm)	Number of students
$140 < x \leqslant 150$	4
$150 < x \leqslant 160$	5
$160 < x \leqslant 170$	16
$170 < x \leqslant 180$	27
$180 < x \leqslant 190$	5
$190 < x \leqslant 200$	3

(a) On the grid opposite, draw a cumulative frequency graph for the information in the table.

(3)



(b) Find an estimate

(i) for the median,

..... cm

(ii) for the interquartile range.

..... cm

(3)

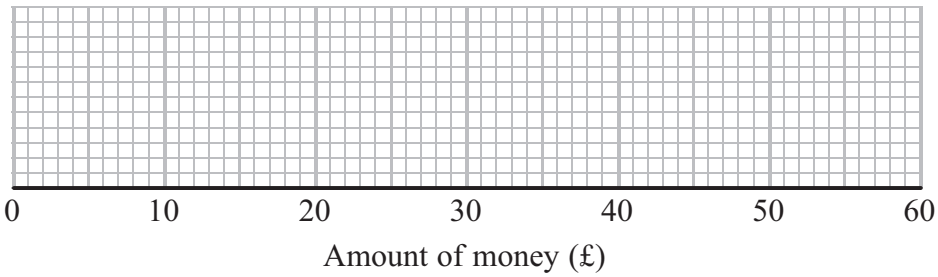
(Total for Question 21 is 6 marks)

17 Some girls did a sponsored swim to raise money for charity.

The table shows information about the amounts of money (£) the girls raised.

Least amount of money (£)	10
Greatest amount of money (£)	45
Median	25
Lower quartile	16
Upper quartile	42

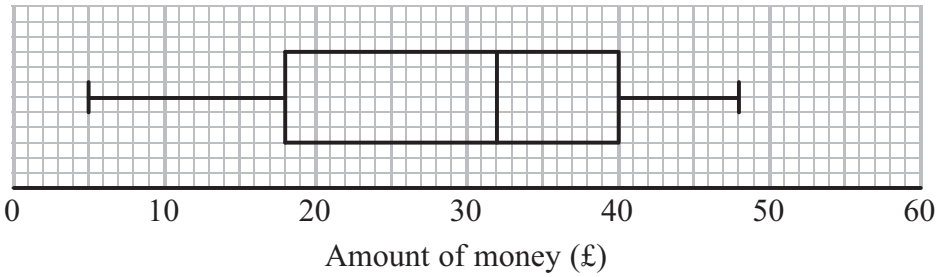
(a) On the grid, draw a box plot for the information in the table.



(2)

Some boys also did the sponsored swim.

The box plot shows information about the amounts of money (£) the boys raised.



(b) Compare the amounts of money the girls raised with the amounts of money the boys raised.

.....

.....

.....

.....

(2)

(Total for Question 17 is 4 marks)

11 Jodie picks all the apples from her 56 apple trees.
For each tree she records the total weight of its apples.

The table shows some information about these total weights in kg.

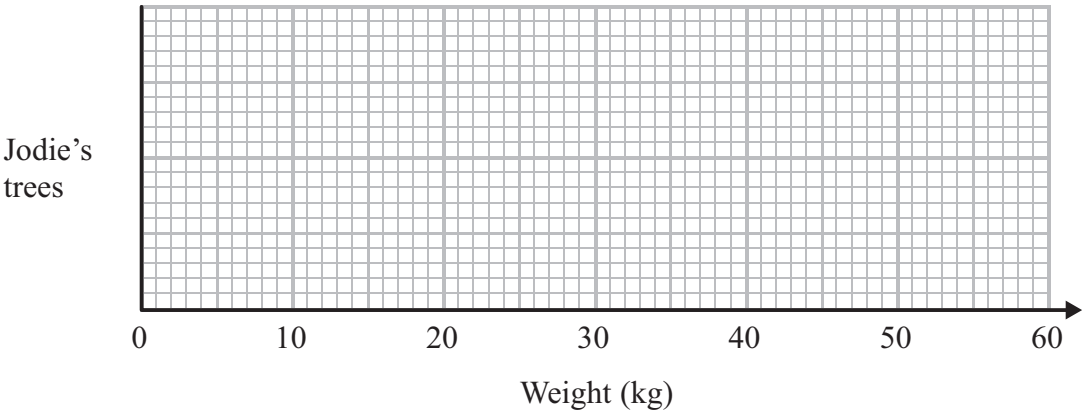
least weight	25
greatest weight	55
median	40
lower quartile	35
upper quartile	45

(a) Work out how many of Jodie's apple trees have a total weight of apples of less than 45 kg.

.....

(2)

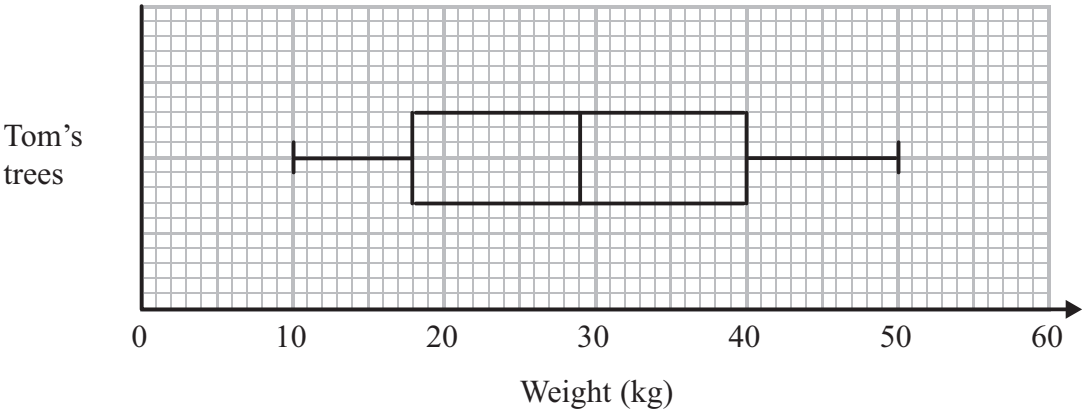
(b) On the grid, draw a box plot for the information in the table.



(2)

Tom has 59 apple trees.

The box plot shows the distribution of the total weights of the apples Tom picks from each of his apple trees.



*(c) Compare the distribution of the weights of apples Jodie picks with the distribution of the weights of apples Tom picks.

.....

.....

.....

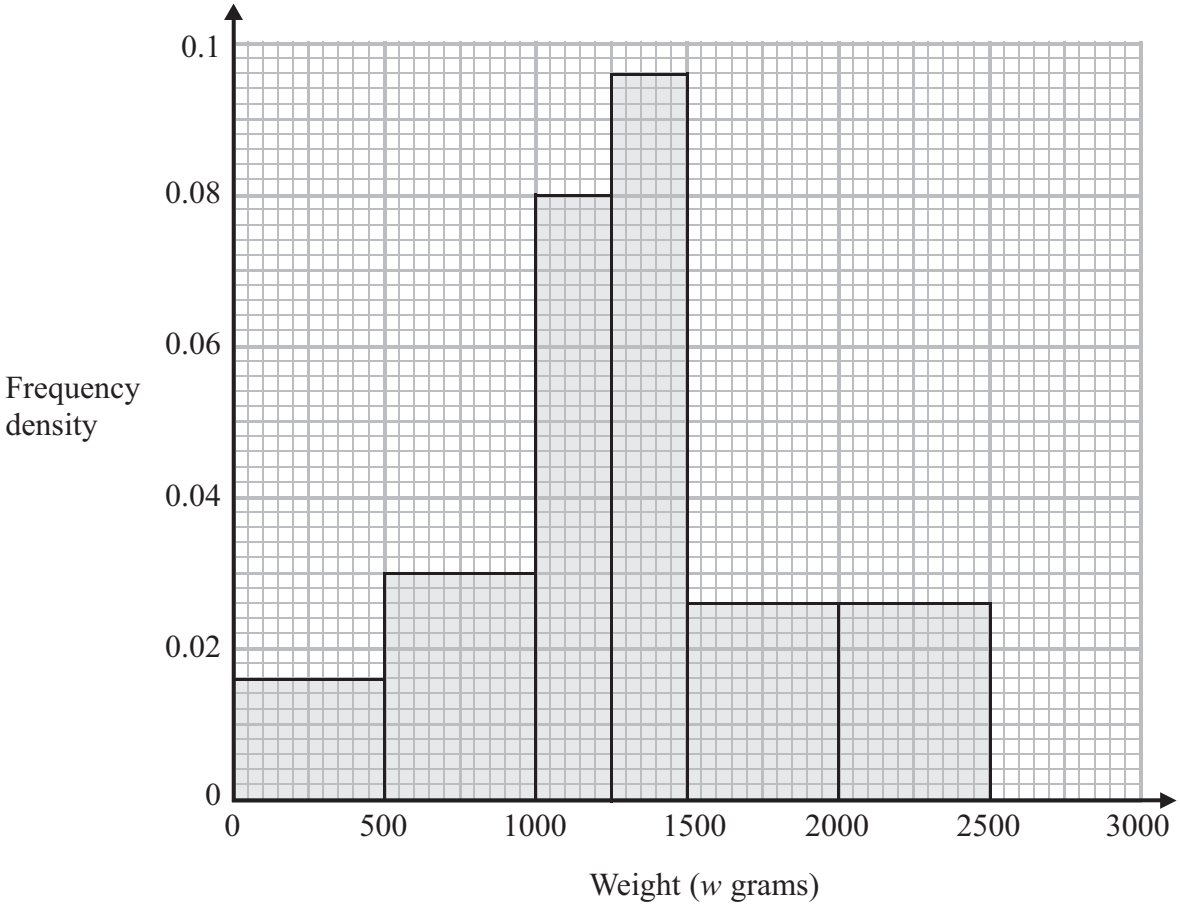
.....

(2)

(Total for Question 11 is 6 marks)

14 Jim went on a fishing holiday.

The histogram shows some information about the weights of the fish he caught.



(a) Use the histogram to complete the frequency table.

Weight (w grams)	Frequency
$0 < w \leqslant 500$	8
$500 < w \leqslant 1000$	
$1000 < w \leqslant 1250$	
$1250 < w \leqslant 1500$	
$1500 < w \leqslant 2500$	

(2)

Jim kept all the fish he caught with a weight greater than 2000 g.

(b) Find the ratio of the number of fish Jim kept to the total number of fish he caught.

.....

(2)

(c) Use the histogram to find an estimate of the median.

..... g

(2)

(Total for Question 14 is 6 marks)

13 Hertford Juniors is a basketball team.

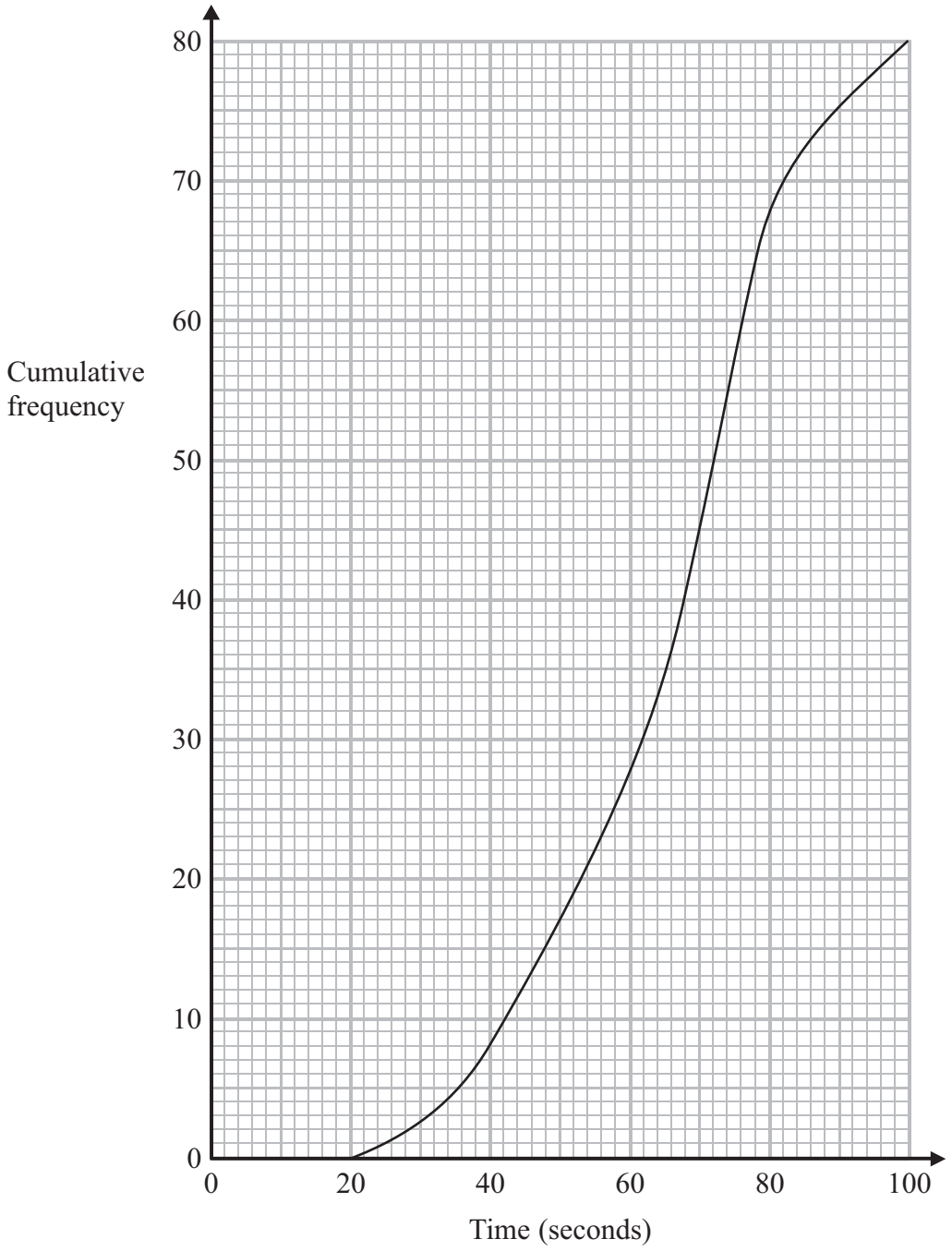
At the end of 10 games, their mean score is 35 points per game.
At the end of 11 games, their mean score has gone down to 33 points per game.

How many points did the team score in the 11th game?

.....

(Total for Question 13 is 3 marks)

18 The cumulative frequency graph shows information about the times 80 swimmers take to swim 50 metres.



(a) Use the graph to find an estimate for the median time.

..... seconds

(1)

A swimmer has to swim 50 metres in 60 seconds or less to qualify for the swimming team.

The team captain says,

"More than 25% of swimmers have qualified for the swimming team."

*(b) Is the team captain right?

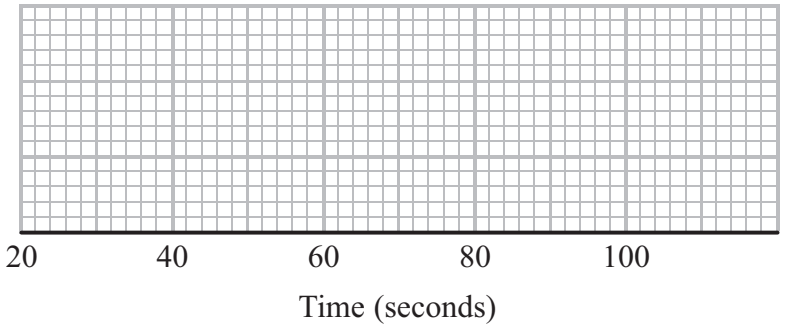
You must show how you got your answer.

(3)

For these 80 swimmers

the least time taken was 28 seconds
and the greatest time taken was 96 seconds.

(c) Use the cumulative frequency graph and the information above to draw a box plot for the times taken by the swimmers.



(3)

(Total for Question 18 is 7 marks)

14 The table gives information about the temperature, T °C, at noon in a town for 50 days.

Temperature (T °C)	Frequency
$8 < T \leqslant 12$	6
$12 < T \leqslant 16$	8
$16 < T \leqslant 20$	13
$20 < T \leqslant 24$	21
$24 < T \leqslant 28$	2

(a) Write down the modal class interval.

.....

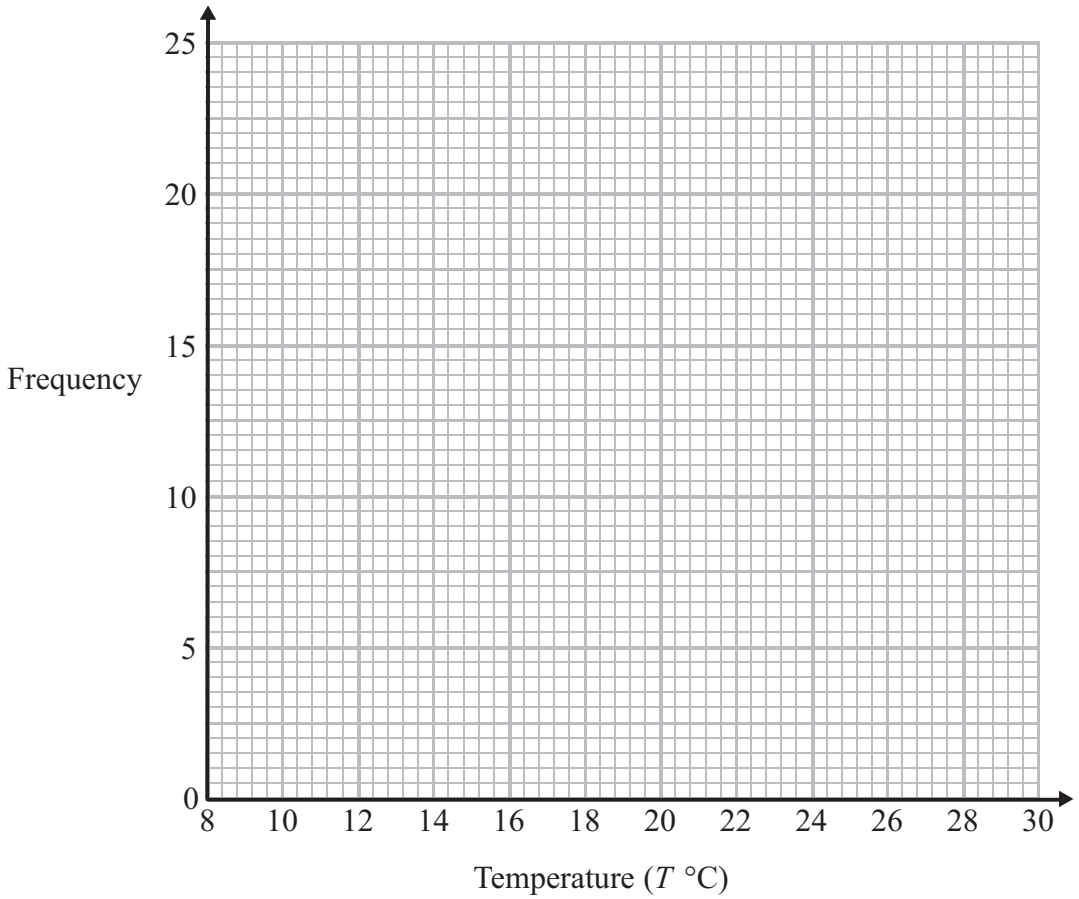
(1)

(b) Calculate an estimate for the mean temperature.

..... °C

(4)

(c) Draw a frequency polygon for the information in the table.



(2)

(Total for Question 14 is 7 marks)

8 Alice is a lorry driver.
She recorded the distance she drove on each of 40 trips.

The table gives information about these distances.

Distance (d miles)	Frequency
$400 < d \leqslant 450$	9
$450 < d \leqslant 500$	15
$500 < d \leqslant 550$	12
$550 < d \leqslant 600$	4

Work out an estimate for the mean distance.

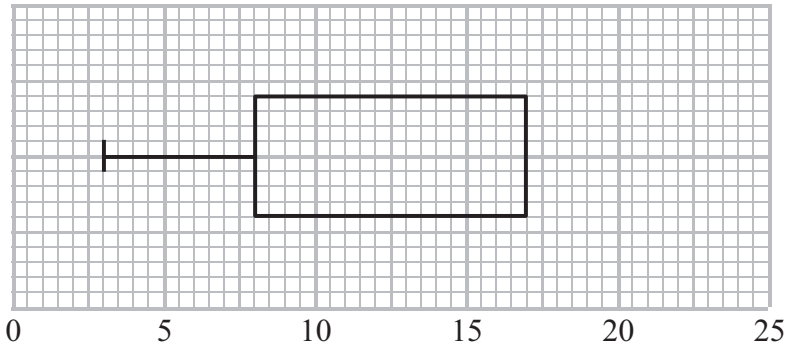
..... miles

(Total for Question 8 is 4 marks)

9 Presta recorded the number of lemons on each of 60 lemon trees.

The incomplete table and box plot give information about her results.

	Number of lemons
Smallest number	
Lower quartile	8
Median	11
Upper quartile	
Greatest number	22



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

(ii) Use the information in the box plot to complete the table.

(3)

Some of these 60 lemon trees have 8 or more lemons on them.

(b) Find an estimate for the number of lemon trees with 8 or more lemons on them.

.....

(2)

(Total for Question 9 is 5 marks)

10 The table gives information about the time it took each of 80 children to do a jigsaw puzzle.

	Number of children	Mean time (minutes)
Boys	32	32.4
Girls	48	28.4

Work out the mean time for all 80 children.

..... minutes

(Total for Question 10 is 3 marks)

20 25 students in class A did a science exam.
30 students in class B did the same science exam.

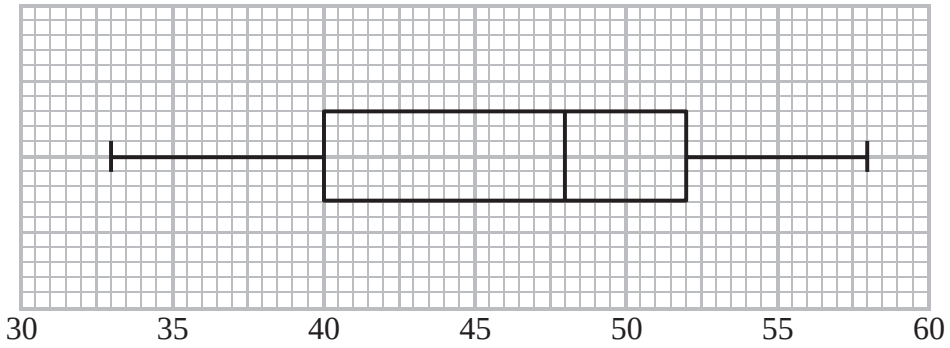
The mean mark for the 25 students in class A is 67.8
The mean mark for all the 55 students is 72.0

Work out the mean mark for the students in class B.

.....

(Total for Question 20 is 3 marks)

9 The box plot gives information about the weights of a group of children.



(a) Write down the median.

..... kg

(1)

(b) Work out the interquartile range.

..... kg

(1)

There are 80 children in the group.

(c) Work out an estimate for the number of children who weigh 52 kg or more.

.....

(2)

(Total for Question 9 is 4 marks)

10 The table shows some information about the times, in minutes, 60 people took to get to work.

Time (x minutes)	Frequency		
$0 < x \leqslant 10$	5		
$10 < x \leqslant 30$	11		
$30 < x \leqslant 50$	23		
$50 < x \leqslant 80$	13		
$80 < x \leqslant 100$	8		

(a) Calculate an estimate for the mean.

..... minutes

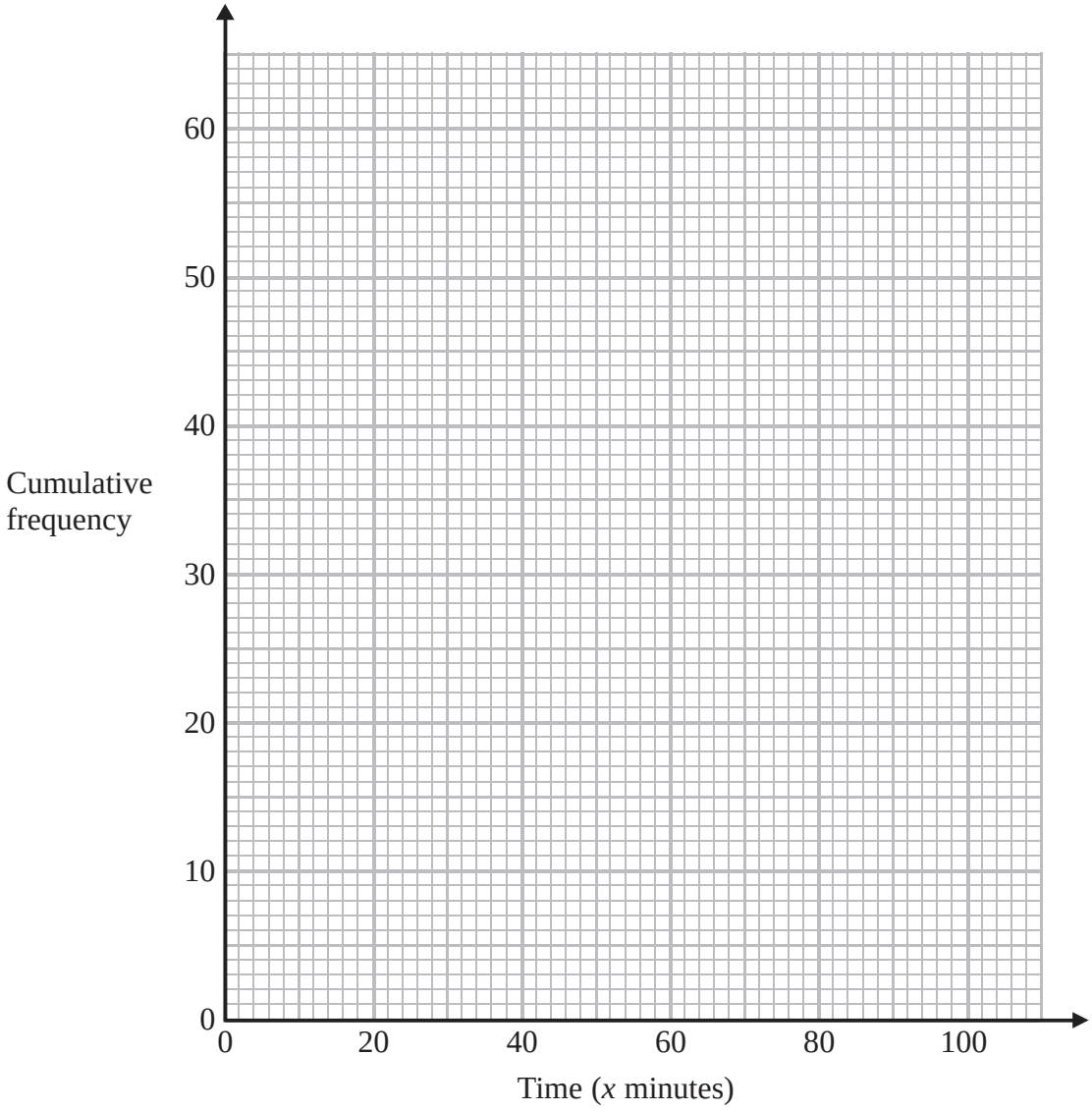
(4)

(b) Complete the cumulative frequency table.

Time (x minutes)	Cumulative frequency
$0 < x \leqslant 10$	
$0 < x \leqslant 30$	
$0 < x \leqslant 50$	
$0 < x \leqslant 80$	
$0 < x \leqslant 100$	

(1)

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



(2)

(d) Find an estimate for the number of people who took **more** than 1 hour to travel to work.

.....

(2)

(Total for Question 10 is 9 marks)

Question 71

11 There are 10 boys and 20 girls in Mrs Brook's class.
Mrs Brook gave all the class a test.

The mean mark for all the class is 60
The mean mark for the girls is 56

Work out the mean mark for the boys.

.....

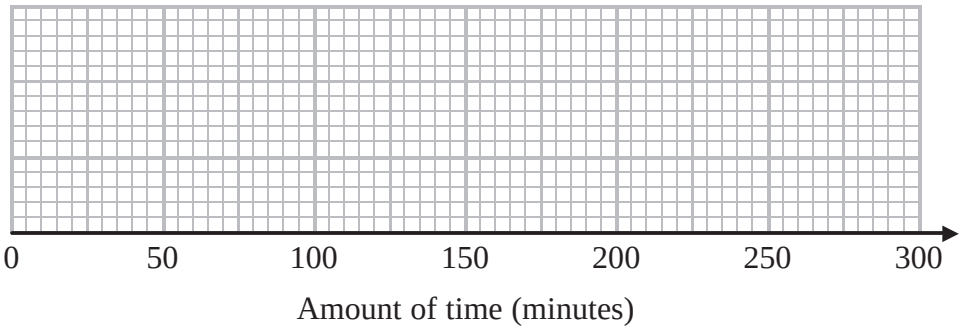
(Total for Question 11 is 3 marks)

15 The students in a class kept a record of the amount of time, in minutes, they spent doing homework last week.

The table shows information about the amount of time the girls spent doing homework last week.

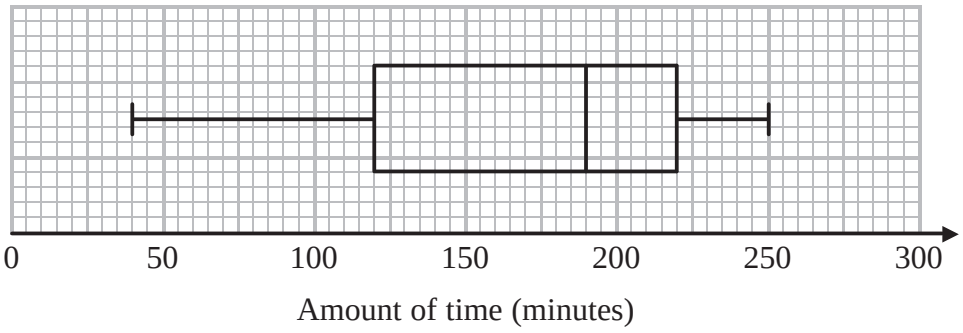
	Minutes
Least amount of time	60
Range	230
Median	170
Lower quartile	100
Upper quartile	220

(a) On the grid, draw a box plot for the information in the table.



(2)

The box plot below shows information about the amount of time the boys spent doing homework last week.



*(b) Compare the amount of time the girls spent doing homework with the amount of time the boys spent doing homework.

.....

.....

.....

.....

(2)

(Total for Question 15 is 4 marks)

18 The table gives some information about the lengths of time, in hours, that some adults watched TV last week.

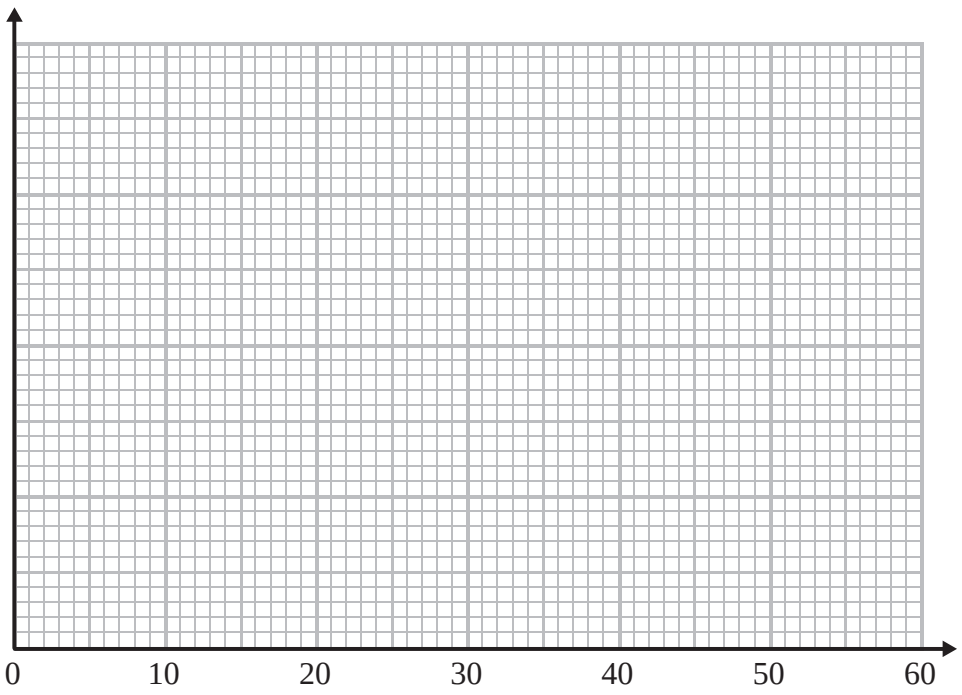
Length of time (t hours)	Frequency
$0 \leqslant t < 10$	8
$10 \leqslant t < 15$	15
$15 \leqslant t < 20$	11
$20 \leqslant t < 30$	10
$30 \leqslant t < 50$	6

(a) Work out an estimate for the mean length of time.

..... hours

(4)

(b) Draw a histogram for the information in the table.



(3)

(Total for Question 18 is 7 marks)

3 Dan, Harry and Regan sell cars.

Dan sells x cars.
Harry sells 5 more cars than Dan.
Regan sells twice as many cars as Dan.

Write an expression, in terms of x, for the mean number of cars Dan, Harry and Regan sell.

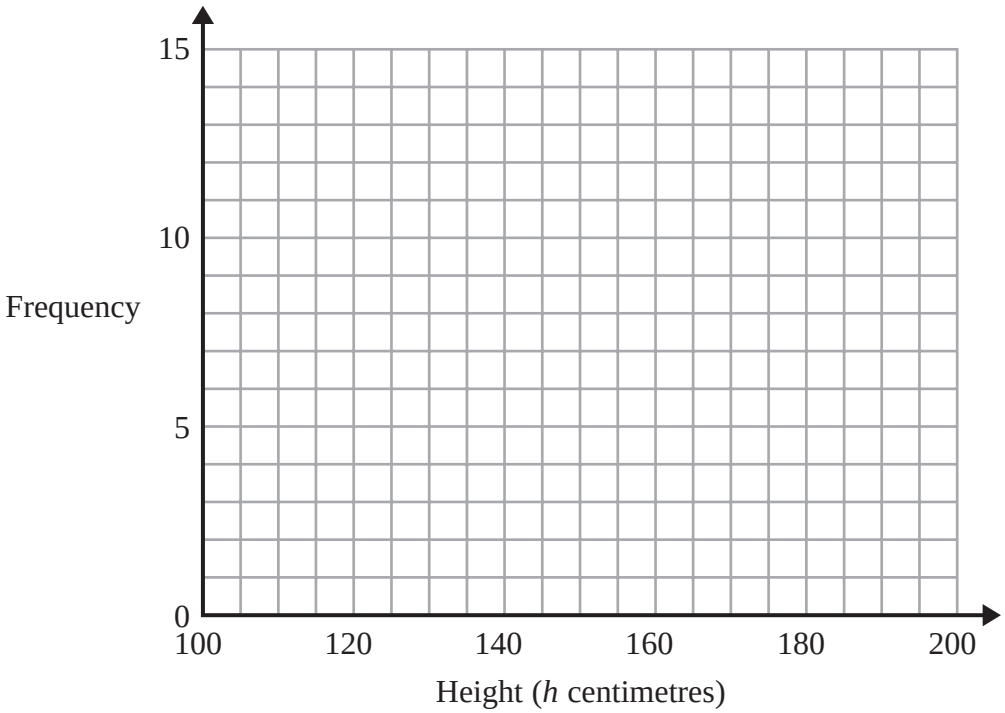
.....

(Total for Question 3 is 2 marks)

4 The table shows information about the heights, in centimetres, of 30 sunflower plants.

Height (h centimetres)	**Frequency**
$100 < h \leqslant 120$	2
$120 < h \leqslant 140$	6
$140 < h \leqslant 160$	7
$160 < h \leqslant 180$	12
$180 < h \leqslant 200$	3

(a) On the grid, draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

.....

(1)

(Total for Question 4 is 3 marks)

*11 Tina went on a cycling holiday.
For the first 5 days, Tina cycled a mean distance of 55 kilometres per day.

On the sixth day, Tina cycled 50 kilometres.

Andy says,

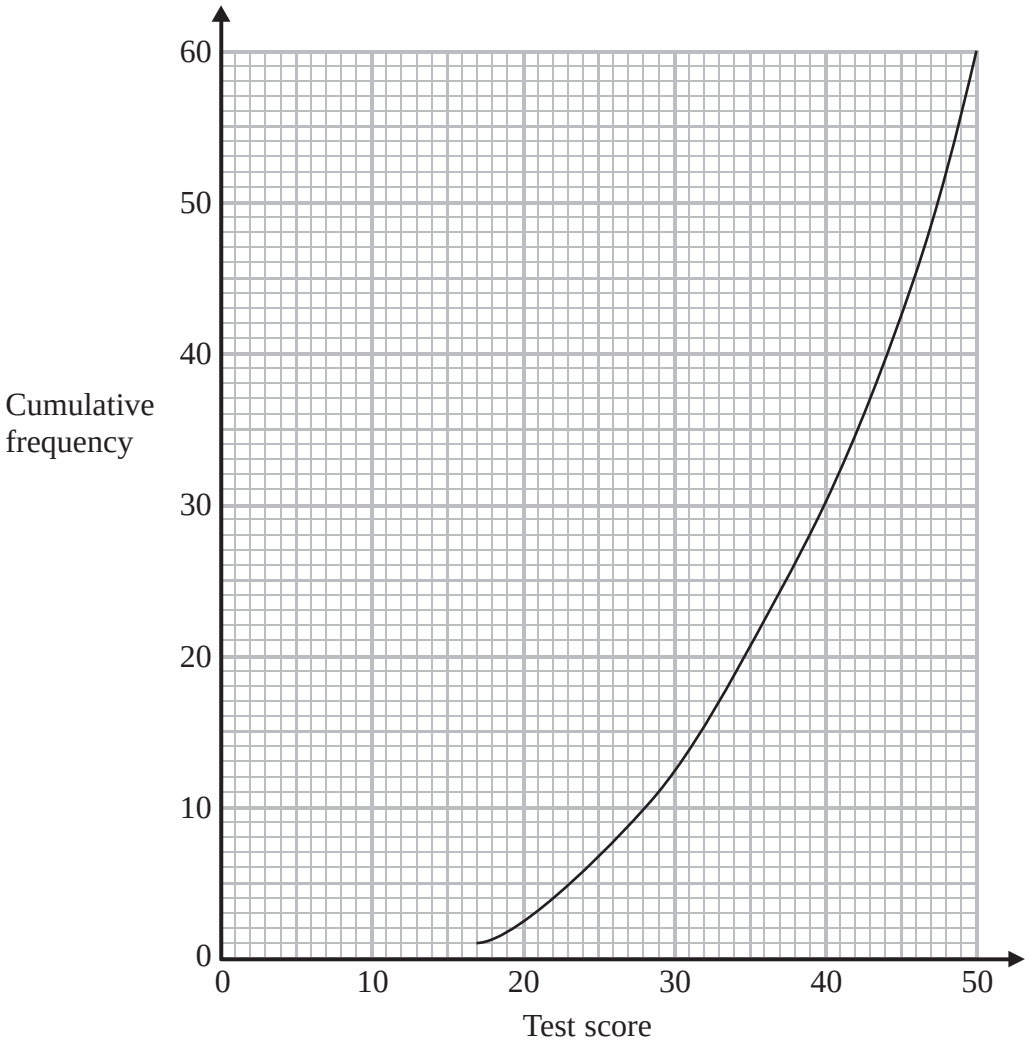
"for all 6 days, the mean distance that Tina cycled per day was 52.5 kilometres".

Is Andy correct?
You must show your working.

(Total for Question 11 is 4 marks)

12 60 people took a driving theory test.

The cumulative frequency graph shows information about their test scores.



(a) Use the graph to find an estimate for the median test score.

.....

(1)

People pass the test when their test score is 43 or more.

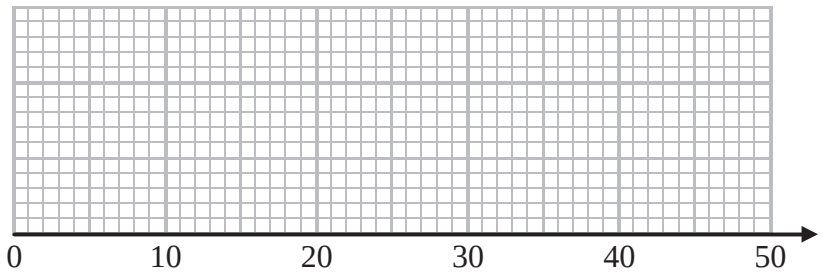
(b) Find an estimate for the number of these people who passed the test.

.....

(2)

The lowest test score was 17
The highest test score was 50

(c) Use this information and the information from the cumulative frequency graph to draw a box plot.



(3)

(Total for Question 12 is 6 marks)

16 The table shows information about the times taken by 100 people in a fun run.

Time (t minutes)	Frequency
$20 < t \leqslant 30$	4
$30 < t \leqslant 40$	16
$40 < t \leqslant 50$	36
$50 < t \leqslant 60$	24
$60 < t \leqslant 70$	14
$70 < t \leqslant 80$	6

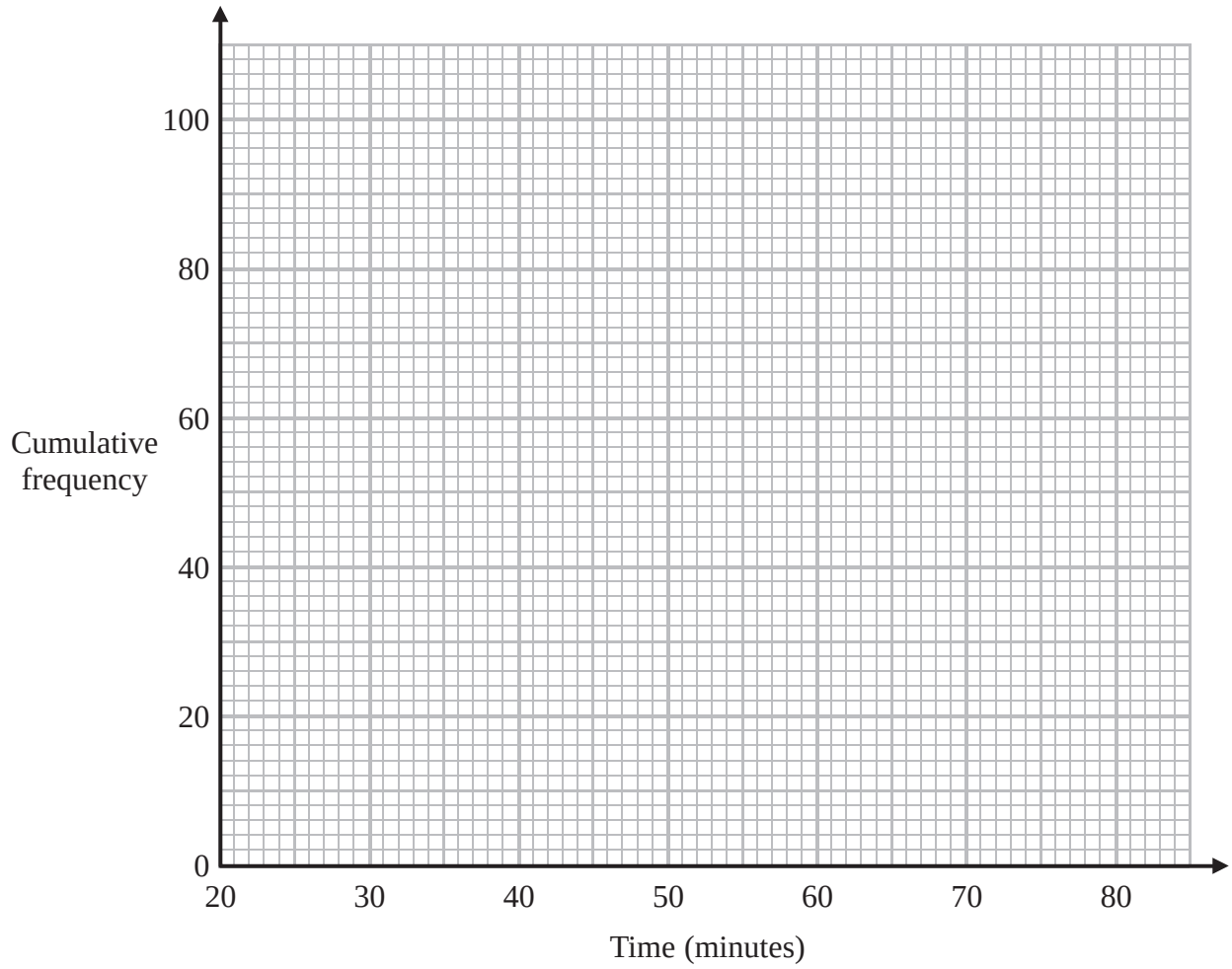
(a) Complete the cumulative frequency table for this information.

Time (t minutes)	Cumulative frequency
$20 < t \leqslant 30$	
$20 < t \leqslant 40$	
$20 < t \leqslant 50$	
$20 < t \leqslant 60$	
$20 < t \leqslant 70$	
$20 < t \leqslant 80$	

(1)

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

(2)



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

..... minutes

(1)

(d) Use your graph to find an estimate for the number of people who took longer than 63 minutes.

.....

(2)

(Total for Question 16 is 6 marks)

14 Sumeet records the times, in minutes, for 40 runners to finish a half marathon.

Information about these times is shown in the table.

Time (t minutes)	Frequency
$60 < t \leqslant 90$	10
$90 < t \leqslant 120$	14
$120 < t \leqslant 150$	9
$150 < t \leqslant 180$	5
$180 < t \leqslant 210$	2

Calculate an estimate for the mean time.

..... minutes

(Total for Question 14 is 4 marks)

18 The owners of a car park recorded the number of cars parked at 12 noon each day.

The table shows information about the number of cars parked in the car park at 12 noon each day in July and in December.

	July	**December**
Least number of cars	75	100
Lower quartile	90	115
Median	95	130
Upper quartile	150	150
Greatest number of cars	178	180

(a) What type of diagram could you draw to represent the information for each month?

.....

(1)

*(b) Compare the distribution of the number of cars recorded in July with the distribution of the number of cars recorded in December.

.....

.....

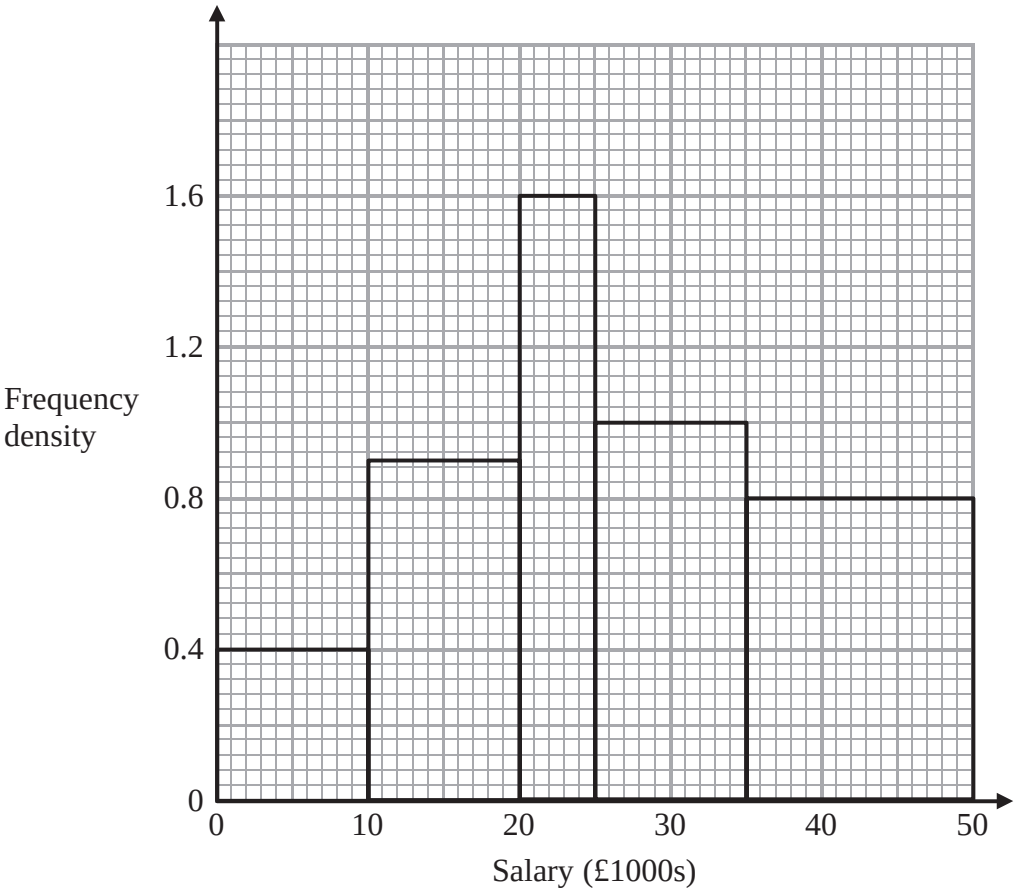
.....

.....

(2)

(Total for Question 18 is 3 marks)

26 The histogram shows some information about the salaries of a sample of people.



(a) Use the histogram to complete the frequency table.

Salary (p) in £1000s	Frequency
$0 < p \leqslant 10$	4
$10 < p \leqslant 20$	
$20 < p \leqslant 25$	
$25 < p \leqslant 35$	
$35 < p \leqslant 50$	

(2)

(b) Work out the proportion of people in the sample who have a salary greater than £40 000

.....

(2)

(c) Find an estimate for the median salary.

£.....

(2)

(Total for Question 26 is 6 marks)

7 The table gives information about the numbers of badges gained by the younger girls in a Guide group.

Number of badges	Frequency
0	2
1	8
2	4
3	3
4	5
5	3

(a) Write down the mode.

.....

(1)

(b) Work out the mean number of badges gained by these girls.

.....

(3)

There are 15 older girls in the Guide group.
The mean number of badges gained by these 15 older girls is 4.4

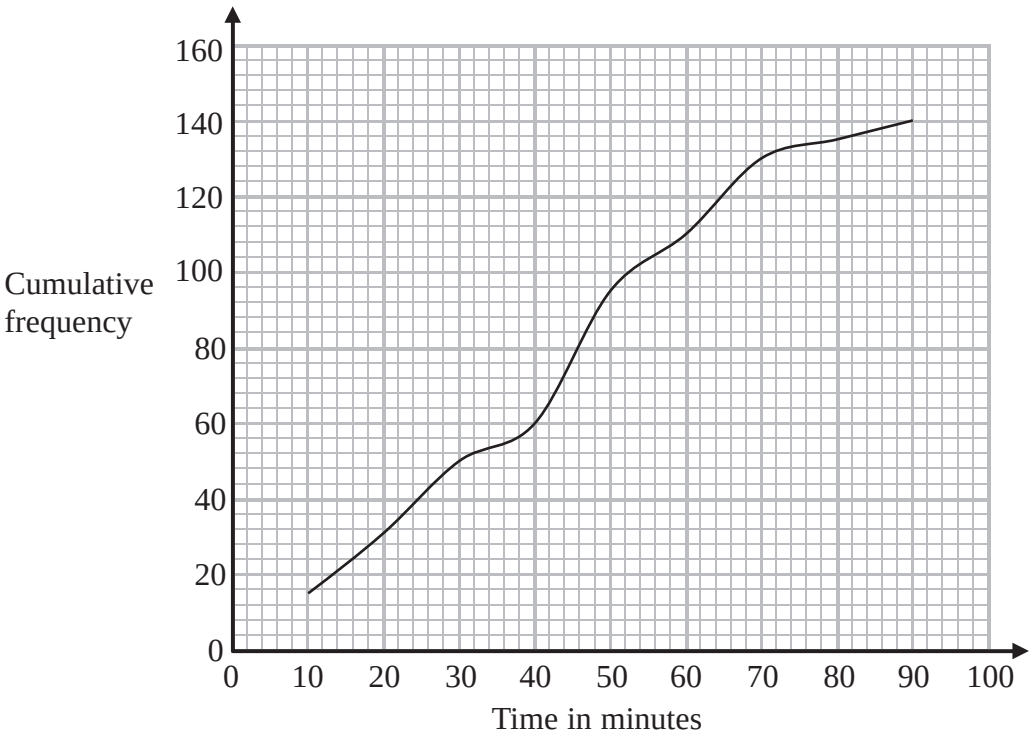
(c) Work out the mean number of badges gained by all the girls in the Guide group.

.....

(3)

(Total for Question 7 is 7 marks)

9 The cumulative frequency graph gives information about the times, in minutes, 140 girls revised for an exam.



(a) Find an estimate for the median.

..... minutes

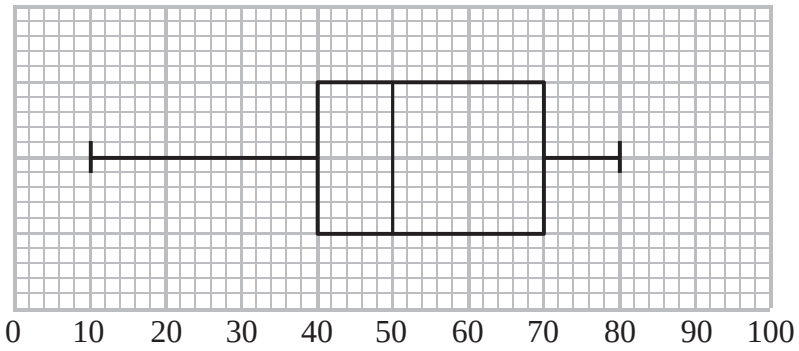
(1)

(b) Find an estimate for the number of girls who revised for more than 30 minutes.

.....

(2)

The box plot gives information about the times, in minutes, 140 boys revised for the same exam.



The lower quartile for the times the girls revised is 22 minutes.
The upper quartile for the times the girls revised is 56 minutes.

*(c) Compare the distribution of the times the girls revised with the distribution of the times the boys revised.

(4)

(Total for Question 9 is 7 marks)

13 There are 18 packets of sweets and 12 boxes of sweets in a carton.

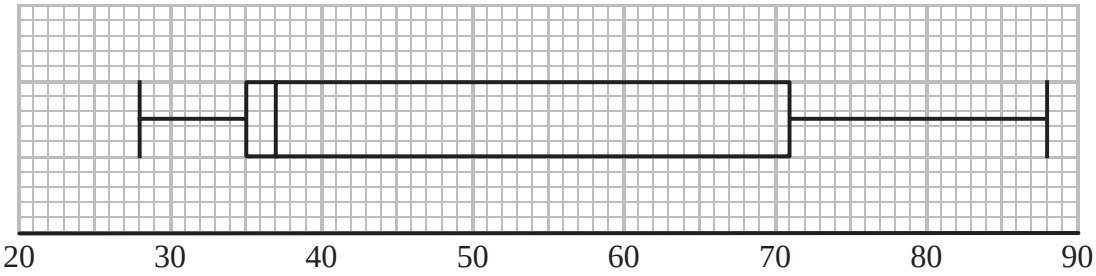
The mean number of sweets in all the 30 packets and boxes is 14
The mean number of sweets in the 18 packets is 10

Work out the mean number of sweets in the boxes.

.....

(Total for Question 13 is 3 marks)

18 The box plot shows information about the number of countries competing in each Winter Olympic Games since 1948



Number of countries in the Winter Olympics

(a) Write down the median.

.....

(1)

(b) Work out the interquartile range.

.....

(2)

The table below shows information about the number of countries competing in each Summer Olympic Games since 1948

	Smallest	**Lower quartile**	**Median**	**Upper quartile**	**Largest**
Number of countries	59	83	121	199	204

*(c) Compare the two distributions.

.....

.....

.....

.....

(2)

(Total for Question 18 is 5 marks)

Question 86

6 Ken is x years old.
Liam is $(x + 4)$ years old.
Tina is $3x$ years old.

Write an expression, in terms of x, for the mean of their ages.

.....

(Total for Question 6 is 2 marks)

8 The table shows information about the number of years 41 teachers have each taught at a school.

Number of years (n)	Number of teachers		
$0 < n \leqslant 10$	14		
$10 < n \leqslant 20$	13		
$20 < n \leqslant 30$	8		
$30 < n \leqslant 40$	4		
$40 < n \leqslant 50$	2		

(a) Write down the class interval that contains the median.

.....

(2)

(b) Calculate an estimate for the mean number of years.
You must show all your working.

.....

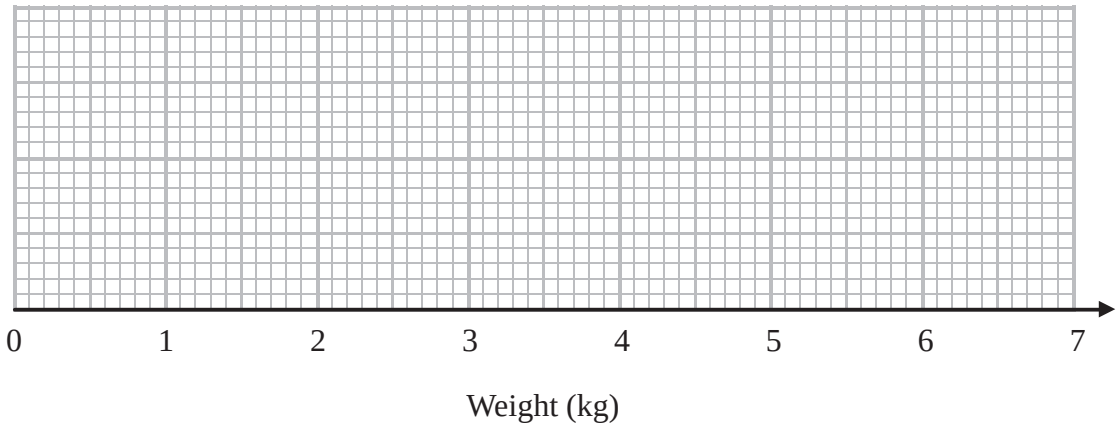
(4)

(Total for Question 8 is 6 marks)

9 The table gives information about the weights of 60 parcels.

Lowest	1.5 kg
Highest	6.3 kg
Lower quartile	2.7 kg
Interquartile range	1.7 kg
Median	3.2 kg

Draw a box plot for this information.



(Total for Question 9 is 3 marks)

10 The table gives information about the heights of 50 trees.

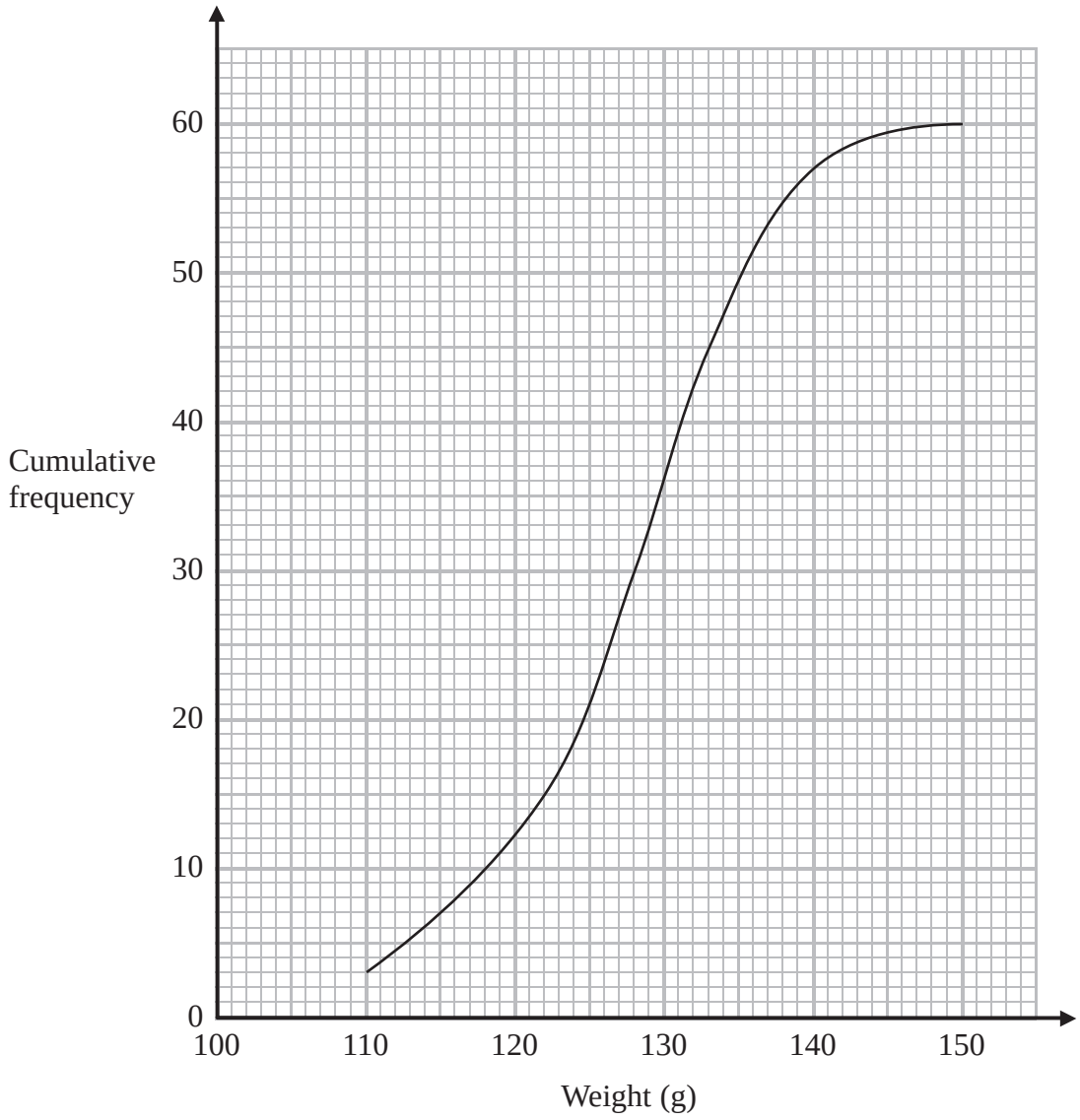
Height (h metres)	Frequency
$0 < h \leqslant 4$	8
$4 < h \leqslant 8$	21
$8 < h \leqslant 12$	12
$12 < h \leqslant 16$	7
$16 < h \leqslant 20$	2

Work out an estimate for the mean height of the trees.

..... m

(Total for Question 10 is 4 marks)

16 The cumulative frequency graph shows information about the weights of 60 apples.



(a) Use the graph to find an estimate for the median weight.

.....g

(1)

(b) Use the graph to find an estimate for the interquartile range of the weights.

.....g

(2)

(Total for Question 16 is 3 marks)

Question 91

3 Alex is x cm tall.

Bob is 10 cm taller than Alex.
Cath is 4 cm shorter than Alex.

Write an expression, in terms of x, for the mean of their heights in centimetres.

.....

(Total for Question 3 is 3 marks)

7 The table shows some information about the prices of 64 secondhand cars that are for sale.

Price (£x)	Frequency		
$0 < x \leqslant 2000$	8		
$2000 < x \leqslant 4000$	14		
$4000 < x \leqslant 6000$	28		
$6000 < x \leqslant 8000$	10		
$8000 < x \leqslant 10000$	4		

(a) Calculate an estimate for the mean price.

£ .....

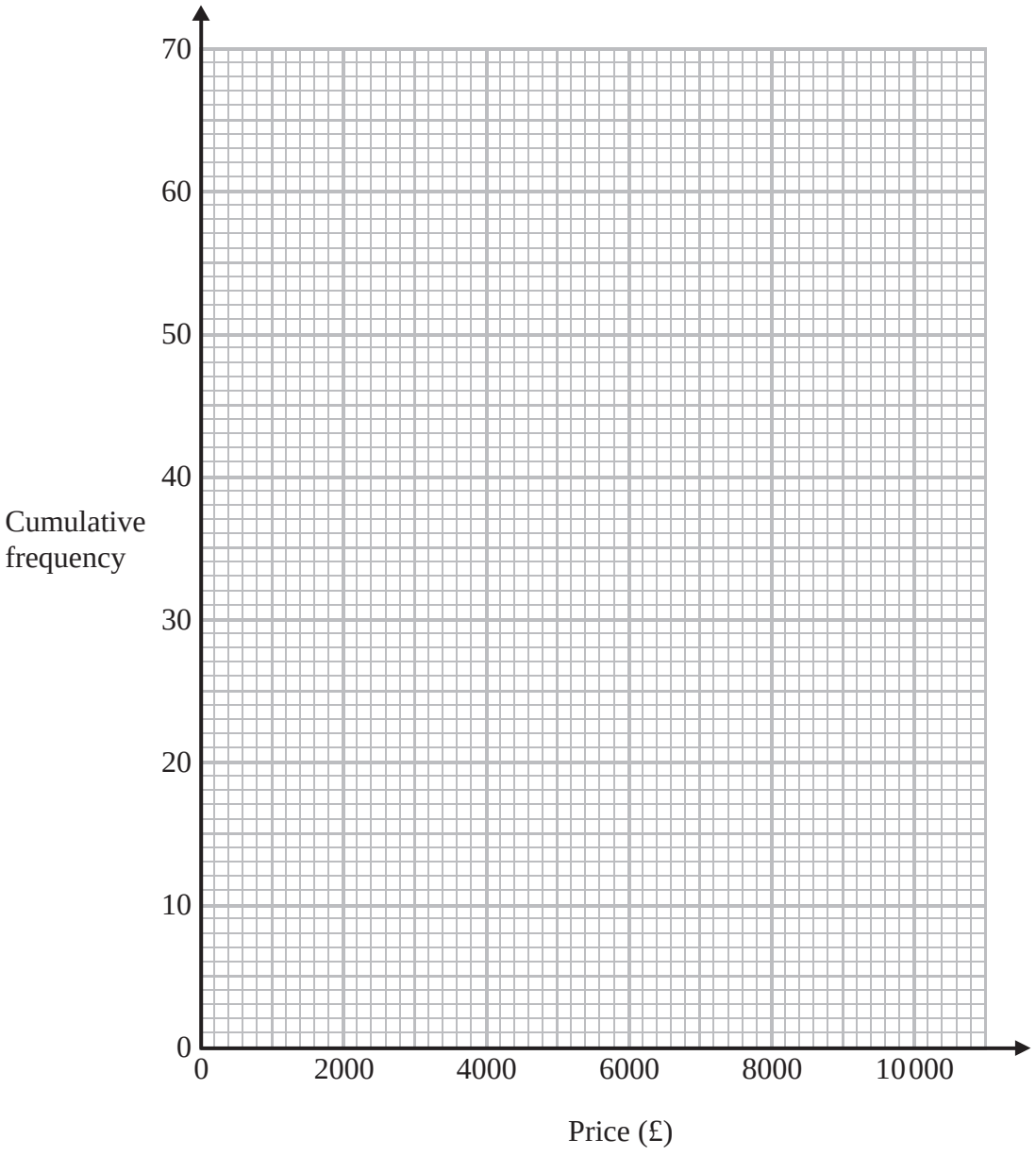
(4)

(b) Complete the cumulative frequency table.

Price (£x)	Cumulative frequency
$0 < x \leqslant 2000$	
$0 < x \leqslant 4000$	
$0 < x \leqslant 6000$	
$0 < x \leqslant 8000$	
$0 < x \leqslant 10000$	

(1)

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



(2)

(d) Find an estimate for the interquartile range.

£.....

(2)

(Total for Question 7 is 9 marks)

10 Alan works in a gym.
One week he recorded the number of people who visited the gym each day.

For Monday to Friday, the mean number of people per day was 98
For the whole week, the mean number of people per day was 114

On Saturday, 162 people visited the gym.
Work out the number of people who visited the gym on Sunday.

.....

(Total for Question 10 is 3 marks)

6 The table shows some information about the ages of 60 teachers.

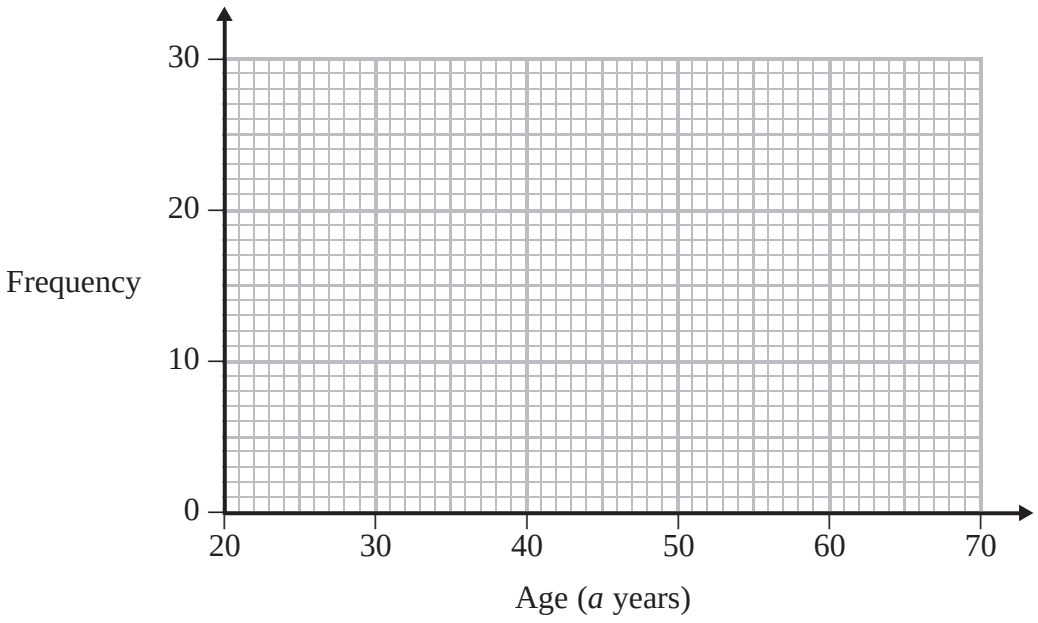
Age (a years)	Frequency
$20 < a \leqslant 30$	6
$30 < a \leqslant 40$	16
$40 < a \leqslant 50$	14
$50 < a \leqslant 60$	22
$60 < a \leqslant 70$	2

(a) Write down the modal class interval.

.....

(1)

(b) Draw a frequency polygon for the information in the table.



(2)

(Total for Question 6 is 3 marks)

16 There are 15 children at a birthday party.
The mean age of the 15 children is 7 years.

9 of the 15 children are boys.
The mean age of the boys is 5 years.

Work out the mean age of the girls.

..... years

(Total for Question 16 is 3 marks)

5 Steph's weight in kilograms is $2x + 9$
Kyle's weight in kilograms is $4x - 7$

Write down an expression, in terms of x, for the mean of their weights.

..... kilograms

(Total for Question 5 is 2 marks)

7 The table gives information about the areas, in cm^2, of some growths of mould in an experiment.

Area (a cm^2)	Frequency
$0 < a \leqslant 5$	4
$5 < a \leqslant 10$	7
$10 < a \leqslant 15$	9
$15 < a \leqslant 20$	15

(a) Write down the class interval that contains the median area.

.....

(1)

(b) Work out an estimate for the mean area.

..... cm^2

(4)

(Total for Question 7 is 5 marks)

10 50 students each did a mathematics test.
The mean score for these 50 students was 8.4

There were 30 boys.
The mean score for these 30 boys was 8.25

Work out the mean score for the girls.

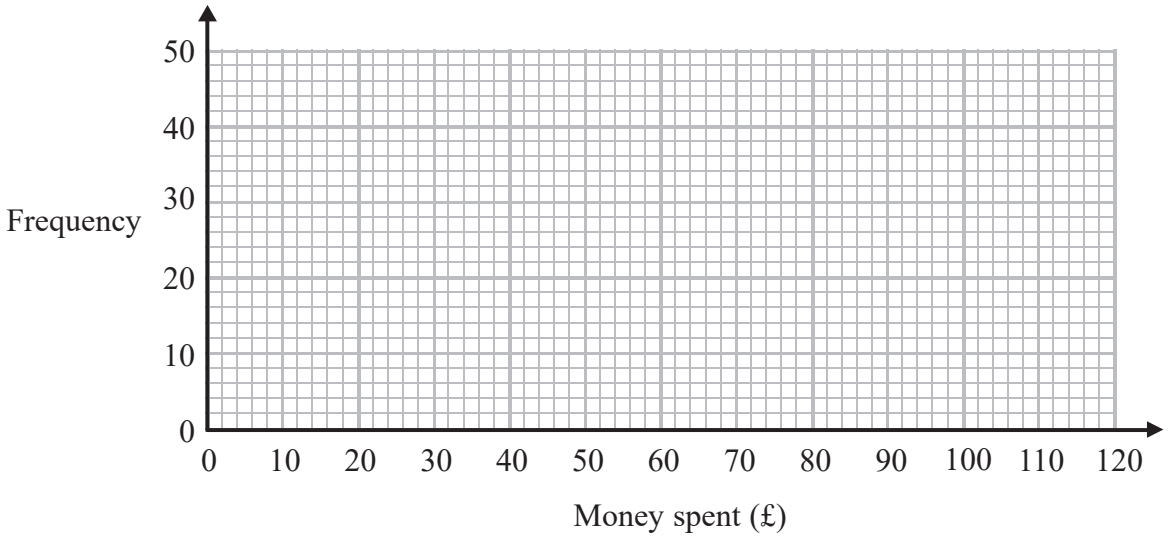
.....

(Total for Question 10 is 3 marks)

3 The table gives information about the money, £A, some people spent on an internet site one day.

Money spent (£A)	Frequency
$0 < A \leqslant 20$	10
$20 < A \leqslant 40$	15
$40 < A \leqslant 60$	25
$60 < A \leqslant 80$	40
$80 < A \leqslant 100$	6

(a) On the grid, draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

.....

(1)

(Total for Question 3 is 3 marks)

12 The table gives information about the heights of 35 girls.

Height (h metres)	Frequency
$1.30 \leqslant h < 1.40$	11
$1.40 \leqslant h < 1.50$	9
$1.50 \leqslant h < 1.60$	7
$1.60 \leqslant h < 1.70$	6
$1.70 \leqslant h < 1.80$	2

(a) Find the class interval that contains the median.

.....

(1)

(b) Work out an estimate for the mean height.

..... m

(4)

(Total for Question 12 is 5 marks)

Question 101

7 There are 10 boys and 20 girls in a class.
The class has a test.

The mean mark for all the class is 60
The mean mark for the girls is 54

Work out the mean mark for the boys.

.....

(Total for Question 7 is 3 marks)

4 Olly drove 56 km from Liverpool to Manchester.
He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was 70 km/h.
Olly took 75 minutes to drive from Manchester to Sheffield.

(a) Work out Olly's average speed for his total drive from Liverpool to Sheffield.

..... km/h

(4)

Janie drove from Barnsley to York.

Janie's average speed from Barnsley to Leeds was 80 km/h.
Her average speed from Leeds to York was 60 km/h.

Janie says that the average speed from Barnsley to York can be found by working out the mean of 80 km/h and 60 km/h.

(b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

.....

.....

(1)

(Total for Question 4 is 5 marks)

3 The table shows some information about the dress sizes of 25 women.

Dress size	Number of women
8	2
10	9
12	8
14	6

(a) Find the median dress size.

.....

(1)

3 of the 25 women have a shoe size of 7

Zoe says that if you choose at random one of the 25 women, the probability that she has either a shoe size of 7 or a dress size of 14 is $\frac{9}{25}$ because

$$\frac{3}{25} + \frac{6}{25} = \frac{9}{25}$$

(b) Is Zoe correct?
You must give a reason for your answer.

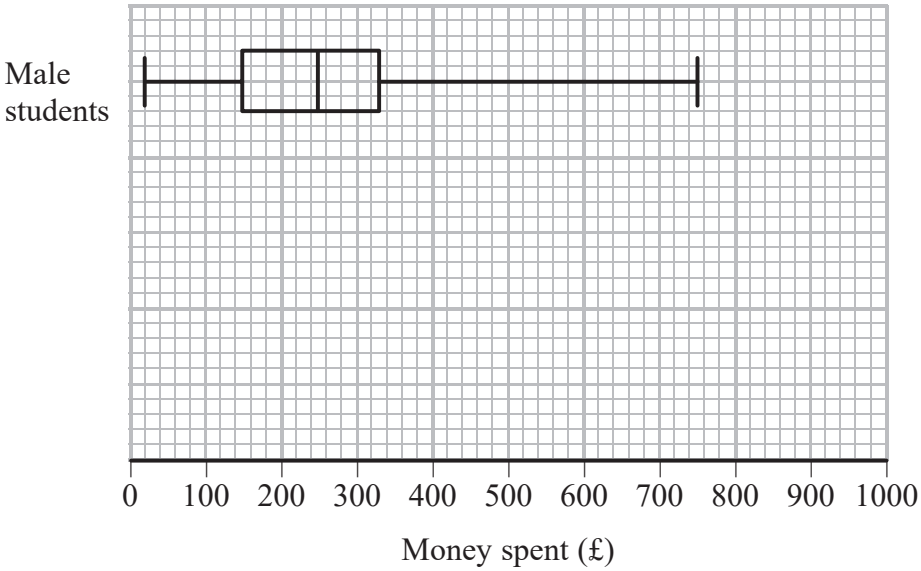
.....

.....

(1)

(Total for Question 3 is 2 marks)

9 The box plot shows information about the distribution of the amounts of money spent by some male students on their holidays.



(a) Work out the interquartile range for the amounts of money spent by these male students.

£.....

(2)

The table below shows information about the distribution of the amounts of money spent by some female students on their holidays.

	Smallest	Lower quartile	Median	Upper quartile	Largest
Money spent (£)	60	180	300	350	650

(b) On the grid above, draw a box plot for the information in the table.

(2)

Chris says,

"The box plots show that the female students spent more money than the male students."

(c) Is Chris correct?
Give a reason for your answer.

.....

.....

.....

.....

(1)

(Total for Question 9 is 5 marks)

5 The table shows information about the weekly earnings of 20 people who work in a shop.

Weekly earnings (£x)	Frequency
$150 < x \leqslant 250$	1
$250 < x \leqslant 350$	11
$350 < x \leqslant 450$	5
$450 < x \leqslant 550$	0
$550 < x \leqslant 650$	3

(a) Work out an estimate for the mean of the weekly earnings.

£.....

(3)

Nadiya says,

"The mean may **not** be the best average to use to represent this information."

(b) Do you agree with Nadiya?
You must justify your answer.

.....

.....

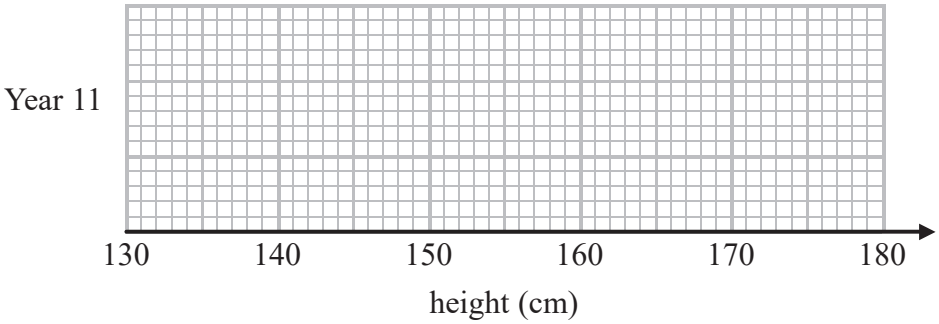
(1)

(Total for Question 5 is 4 marks)

12 The table shows information about the heights, in cm, of a group of Year 11 girls.

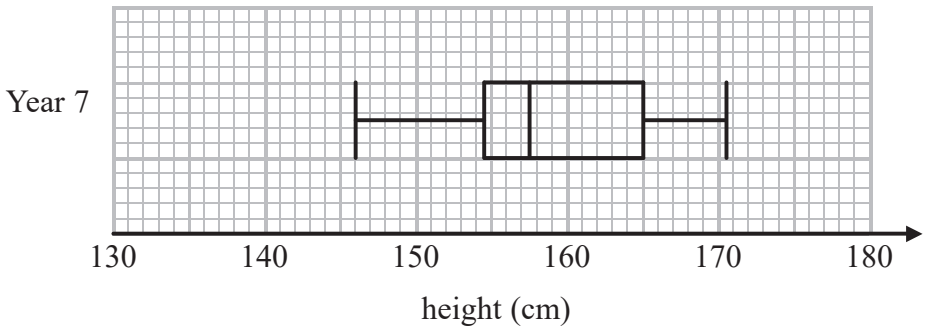
	height (cm)
least height	154
median	165
lower quartile	161
interquartile range	7
range	20

(a) Draw a box plot for this information.



(3)

The box plot below shows information about the heights, in cm, of a group of Year 7 girls.



(b) Compare the distribution of heights of the Year 7 girls with the distribution of heights of the Year 11 girls.

.....

.....

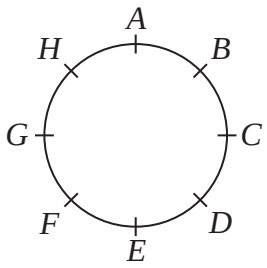
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.....

(2)

(Total for Question 12 is 5 marks)

3 Hasmeet walks once round a circle with diameter 80 metres.



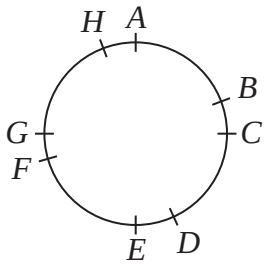
There are 8 points equally spaced on the circumference of the circle.

(a) Find the distance Hasmeet walks between one point and the next point.

.....m

(2)

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed? You must give a reason for your answer.

.....

.....

(1)

(Total for Question 3 is 3 marks)

1 The table shows information about the heights of 80 children.

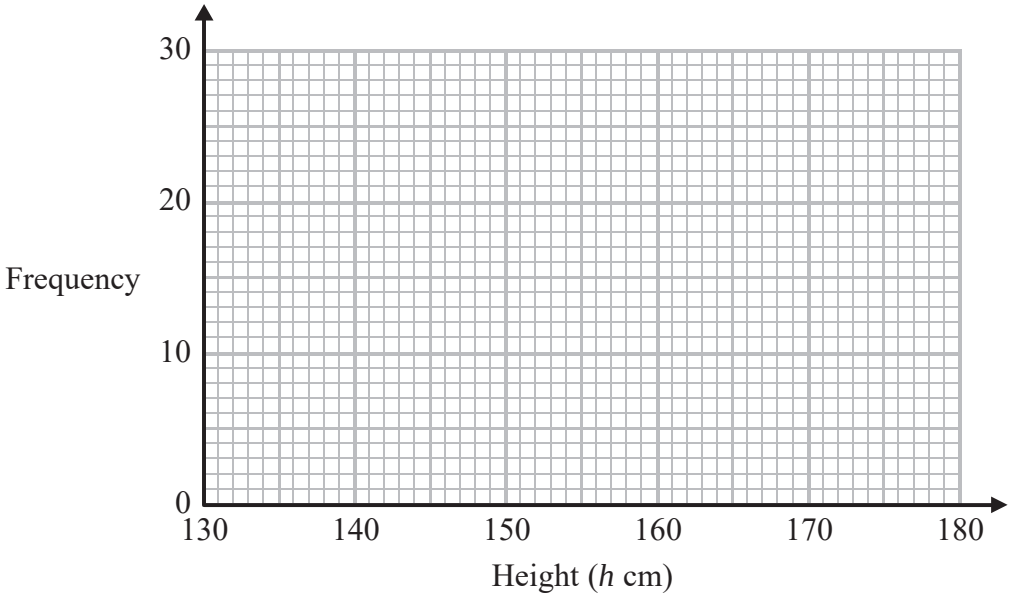
Height (h cm)	Frequency
$130 < h \leqslant 140$	4
$140 < h \leqslant 150$	11
$150 < h \leqslant 160$	24
$160 < h \leqslant 170$	22
$170 < h \leqslant 180$	19

(a) Find the class interval that contains the median.

.....

(1)

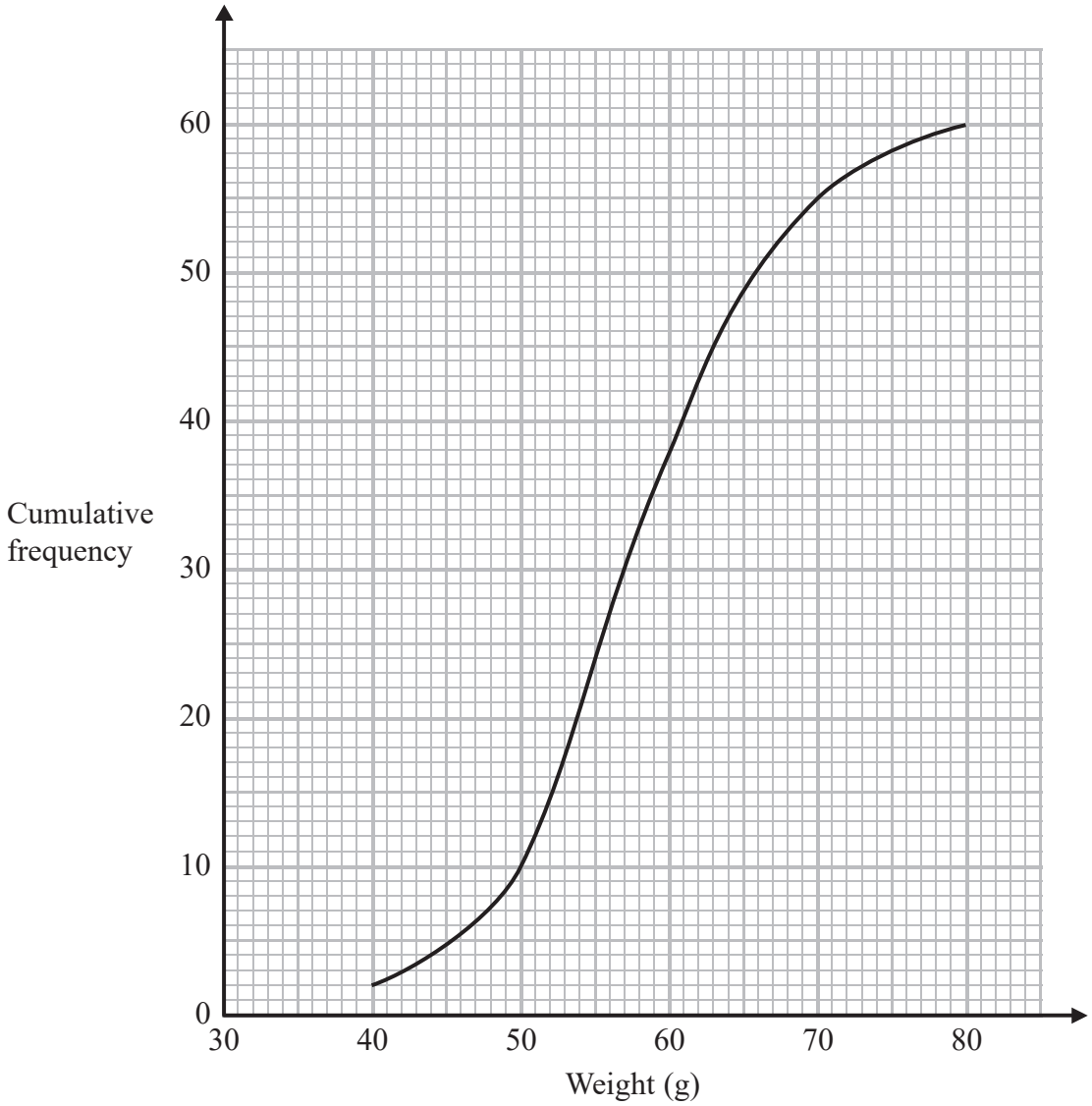
(b) Draw a frequency polygon for the information in the table.



(2)

(Total for Question 1 is 3 marks)

11 The cumulative frequency graph shows information about the weights of 60 potatoes.



(a) Use the graph to find an estimate for the median weight.

..... g

(1)

Jamil says,

"80 − 40 = 40 so the range of the weights is 40 g."

(b) Is Jamil correct?
You must give a reason for your answer.

.....

.....

(1)

(c) Show that less than 25% of the potatoes have a weight greater than 65 g.

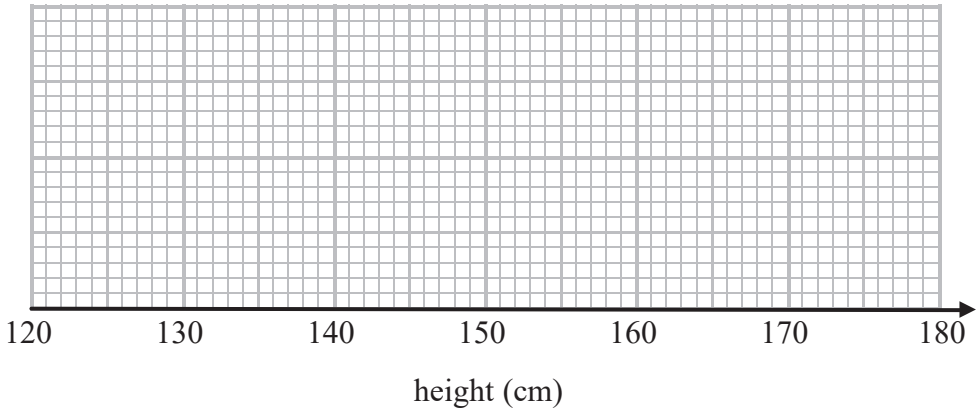
(2)

(Total for Question 11 is 4 marks)

10 The table gives some information about the heights of 80 girls.

Least height	133 cm
Greatest height	170 cm
Lower quartile	145 cm
Upper quartile	157 cm
Median	151 cm

(a) Draw a box plot to represent this information.



(3)

(b) Work out an estimate for the number of these girls with a height between 133 cm and 157 cm.

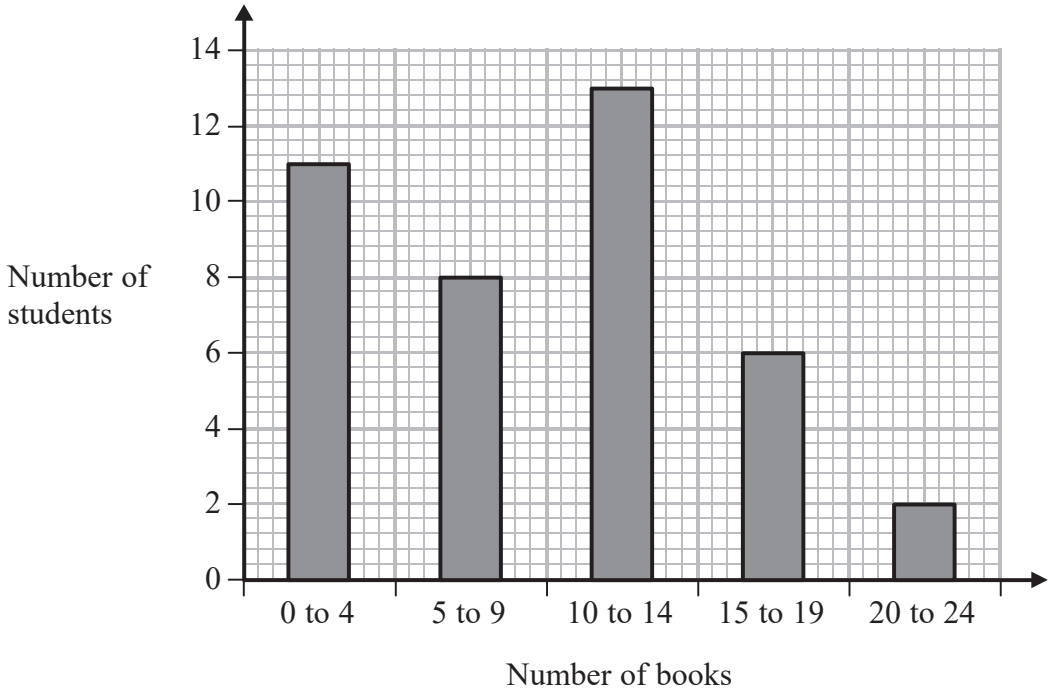
.....

(2)

(Total for Question 10 is 5 marks)

4 Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.



(a) Work out the percentage of these students who bought 20 or more books.

.....%

(2)

(b) Show that an estimate for the mean number of books bought is 9.5
You must show all your working.

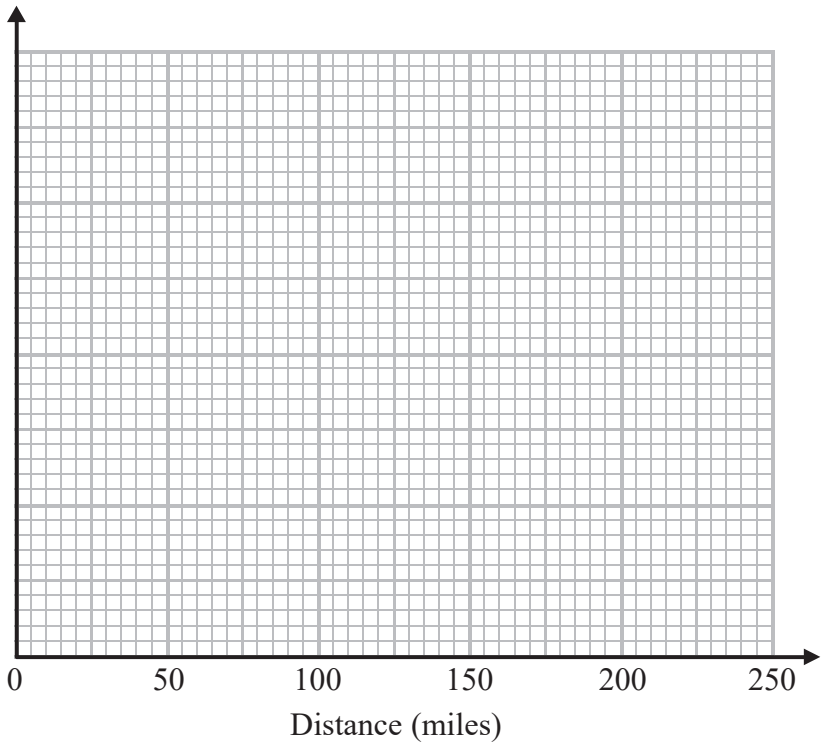
(4)

(Total for Question 4 is 6 marks)

17 The table shows information about the distances 570 students travelled to a university open day.

Distance (d miles)	Frequency
$0 < d \leqslant 20$	120
$20 < d \leqslant 50$	90
$50 < d \leqslant 80$	120
$80 < d \leqslant 150$	140
$150 < d \leqslant 200$	100

(a) Draw a histogram for the information in the table.



(3)

(b) Estimate the median distance.

..... miles

(2)

(Total for Question 17 is 5 marks)

11 A bus company recorded the ages, in years, of the people on coach A and the people on coach B.

Here are the ages of the 23 people on coach A.

41	42	44	48	52	53	53	53	56	57	57	59
60	61	63	64	64	66	67	69	74	77	79	

(a) Complete the table below to show information about the ages of the people on coach A.

Median	
Lower quartile	
Upper quartile	
Least age	41
Greatest age	79

(2)

Here is some information about the ages of the people on coach B.

Median	70
Lower quartile	54
Upper quartile	73
Least age	42
Greatest age	85

Richard says that the people on coach A are younger than the people on coach B.

(b) Is Richard correct?
You must give a reason for your answer.

.....

.....

.....

(1)

Richard says that the people on coach A vary more in age than the people on coach B.

(c) Is Richard correct?
You must give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 11 is 4 marks)

3 The table shows information about the heights of 80 plants.

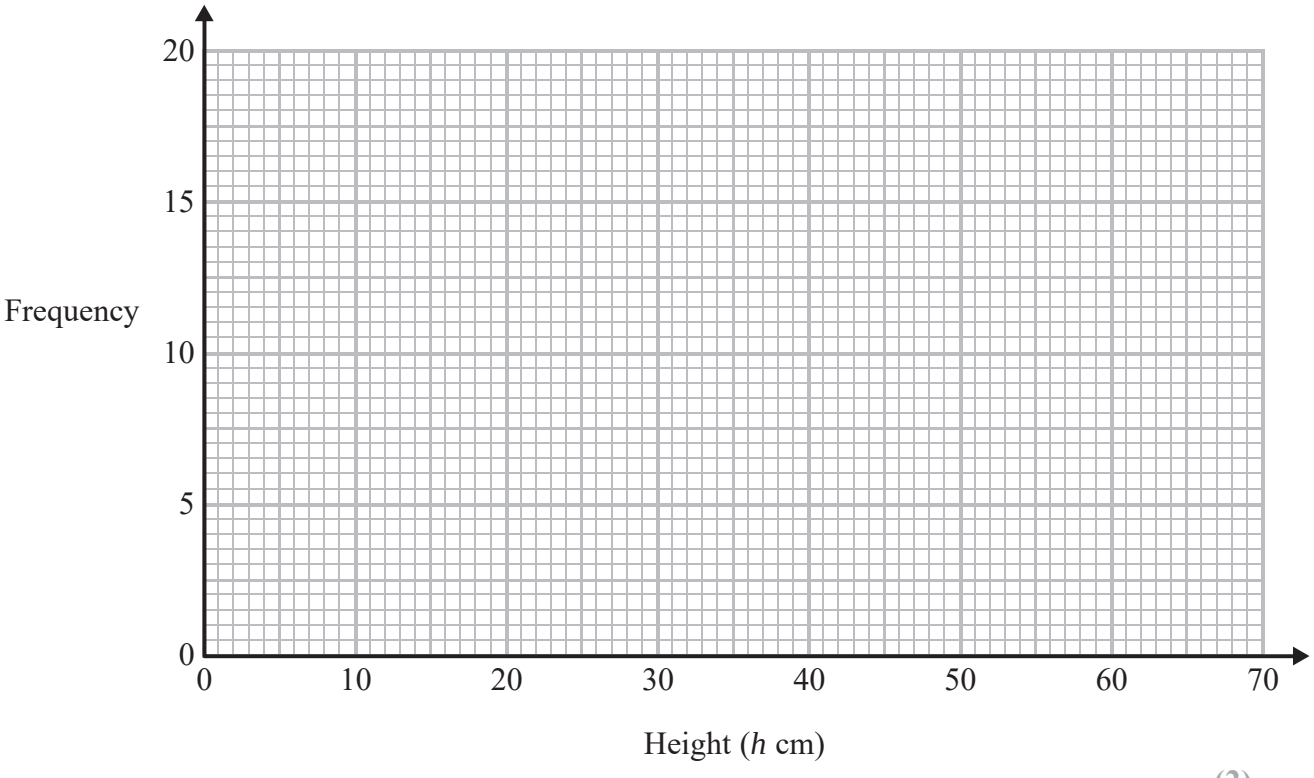
Height (h cm)	Frequency
$10 < h \leqslant 20$	7
$20 < h \leqslant 30$	13
$30 < h \leqslant 40$	14
$40 < h \leqslant 50$	12
$50 < h \leqslant 60$	16
$60 < h \leqslant 70$	18

(a) Find the class interval that contains the median.

.....

(1)

(b) On the grid, draw a frequency polygon for the information in the table.



(2)

(Total for Question 3 is 3 marks)

6 4 red bricks have a mean weight of 5 kg.
5 blue bricks have a mean weight of 9 kg.
1 green brick has a weight of 6 kg.

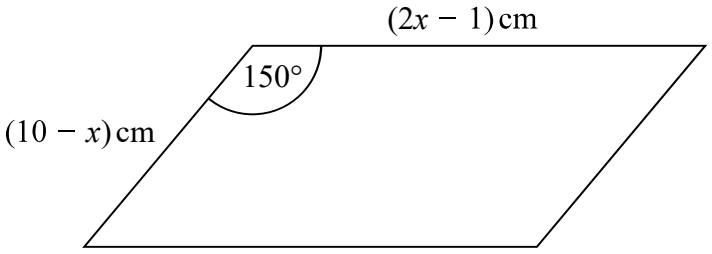
Donna says,

"The mean weight of the 10 bricks is less than 7 kg."

Is Donna correct?
You must show how you get your answer.

(Total for Question 6 is 3 marks)

23 The diagram shows a parallelogram.



The area of the parallelogram is greater than $15\,\text{cm}^2$

(a) Show that $2x^2 - 21x + 40 < 0$

(3)

(b) Find the range of possible values of x.

.....

(3)

(Total for Question 23 is 6 marks)

4 The table gives information about the times taken, in seconds, by 18 students to run a race.

Time (t seconds)	Frequency
$5 < t \leqslant 10$	1
$10 < t \leqslant 15$	2
$15 < t \leqslant 20$	7
$20 < t \leqslant 25$	8

Work out an estimate for the mean time.
Give your answer correct to 3 significant figures.

..... seconds

(Total for Question 4 is 3 marks)

7 The table shows information about the heights, in cm, of a group of Year 9 girls.

least height	150 cm
median	165 cm
greatest height	170 cm

This stem and leaf diagram shows information about the heights, in cm, of a group of 15 Year 9 boys.

15	8 9 9
16	4 5 7 7 8
17	0 3 4 4 7
18	0 2

Key: 15 | 8 represents 158 cm

Compare the distribution of the heights of the girls with the distribution of the heights of the boys.

.....

.....

.....

.....

.....

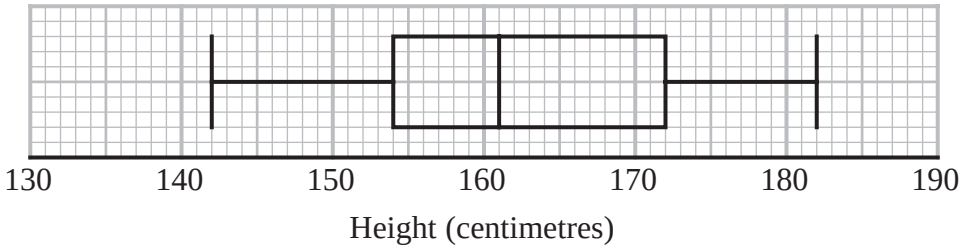
.....

(Total for Question 7 is 3 marks)

9 Aisha recorded the heights, in centimetres, of some girls.
She used her results to work out the information in this table.

Least height	142 cm
Lower quartile	154 cm
Interquartile range	17 cm
Median	162 cm
Range	40 cm

Aisha drew this box plot for the information in the table.
The box plot is **not** fully correct.



Write down the two things Aisha should do to make the box plot fully correct.

1 .....

.....

.....

2 .....

.....

.....

(Total for Question 9 is 2 marks)

7 There is a total of 45 boys and girls in a choir.

The mean age of the 18 boys is 16.2 years.
The mean age of the 27 girls is 16.7 years.

Calculate the mean age of all 45 boys and girls.

..... years

(Total for Question 7 is 3 marks)

10 A person's heart beats approximately 10^5 times each day.
A person lives for approximately 81 years.

(a) Work out an estimate for the number of times a person's heart beats in their lifetime.
Give your answer in standard form correct to 2 significant figures.

.....

(2)

2×10^{12} red blood cells have a total mass of 90 grams.

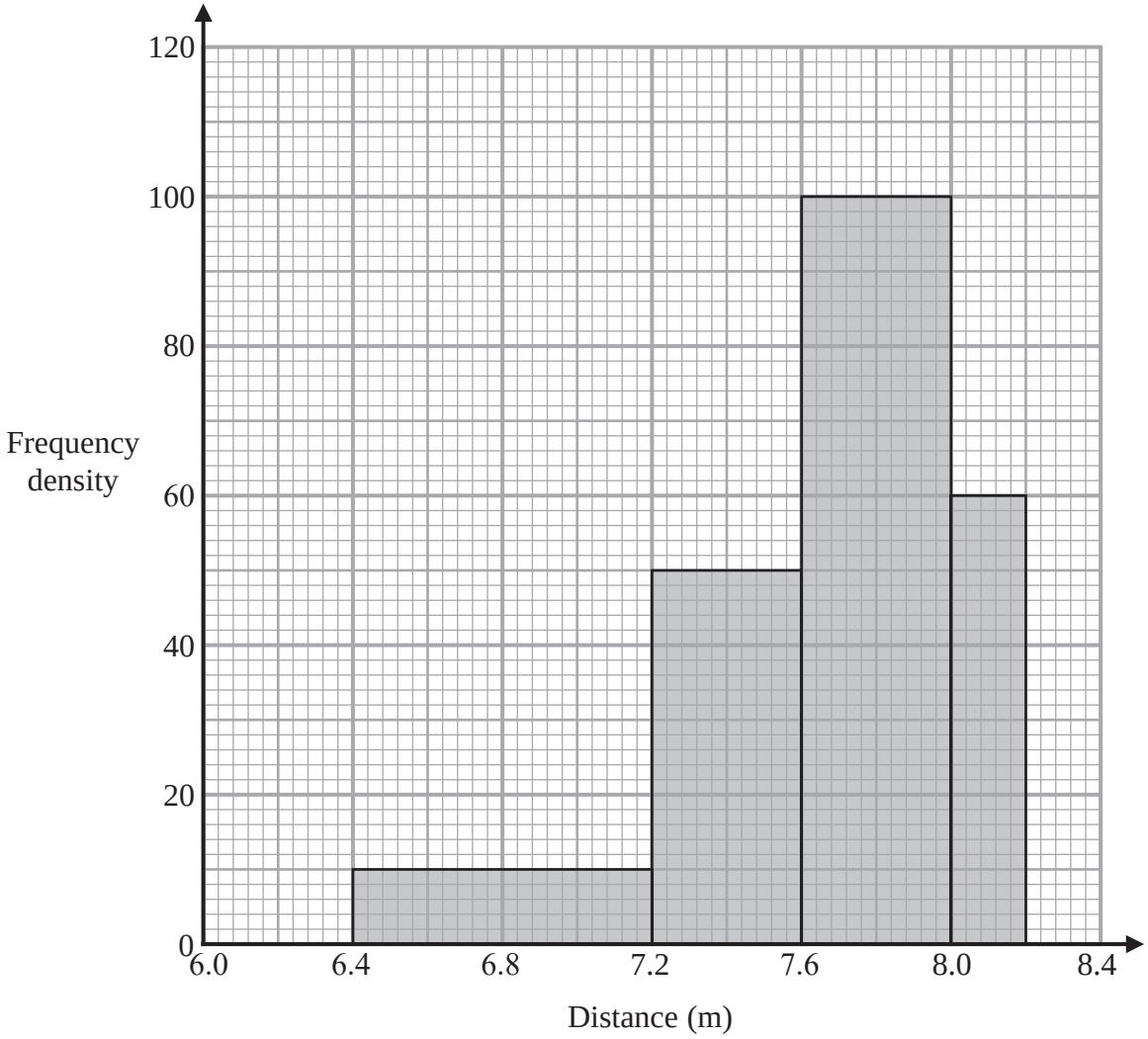
(b) Work out the average mass of 1 red blood cell.
Give your answer in standard form.

..... grams

(2)

(Total for Question 10 is 4 marks)

17 The histogram gives information about the distances 80 competitors jumped in a long jump competition.



Calculate an estimate for the mean distance.

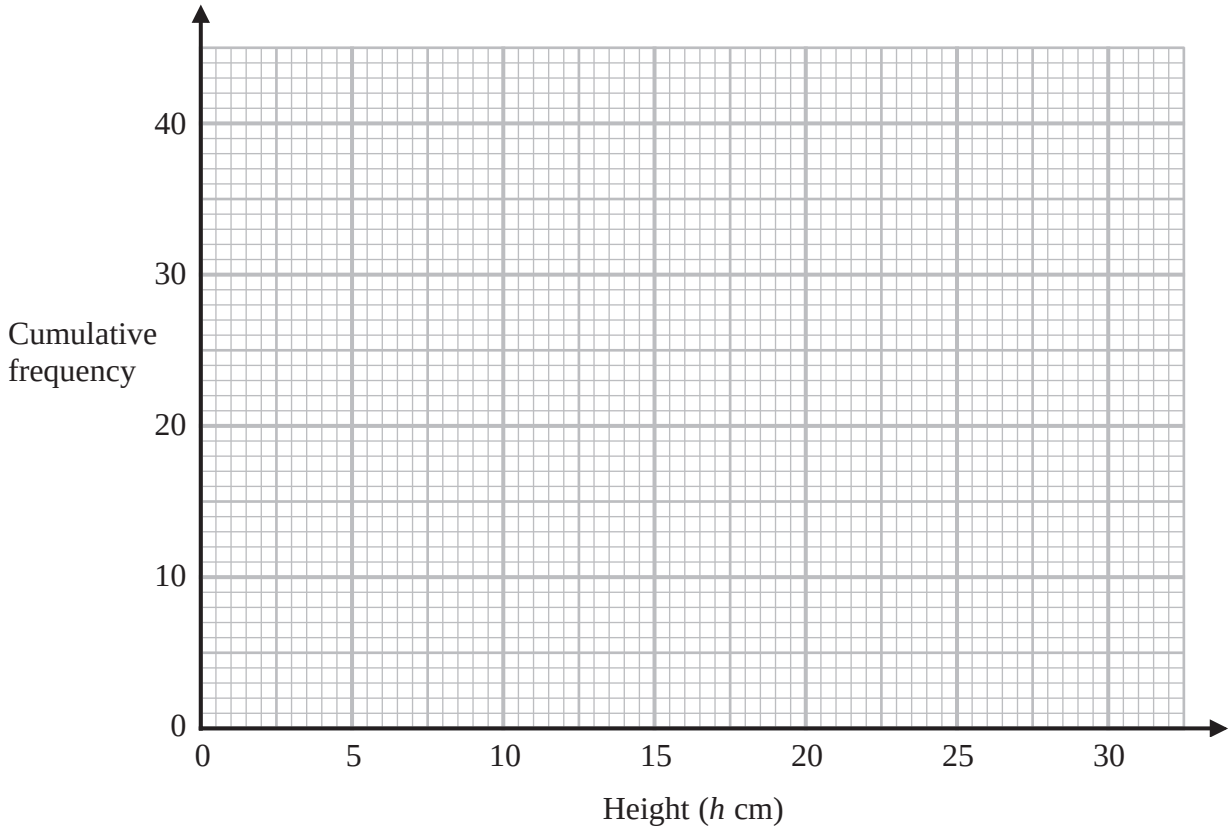
..... m

(Total for Question 17 is 4 marks)

12 The cumulative frequency table gives information about the heights, in cm, of 40 plants.

Height (h cm)	Cumulative Frequency
$0 < h \leqslant 5$	4
$0 < h \leqslant 10$	11
$0 < h \leqslant 15$	24
$0 < h \leqslant 20$	34
$0 < h \leqslant 25$	38
$0 < h \leqslant 30$	40

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



(2)

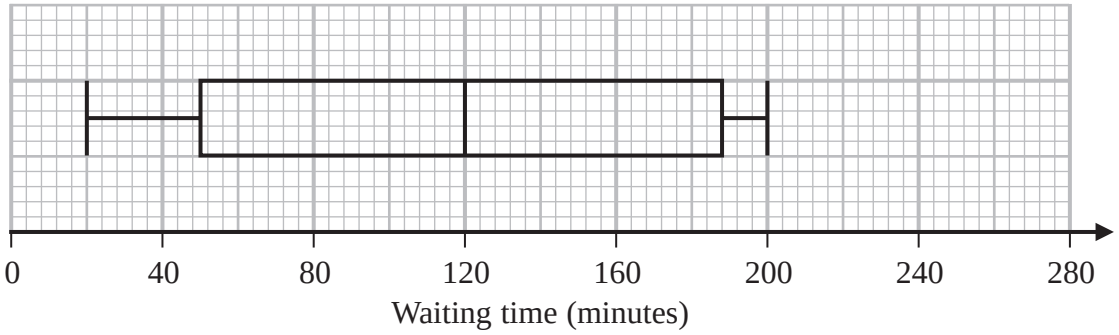
(b) Use the graph to find an estimate for the median height of the plants.

..... cm

(1)

(Total for Question 12 is 3 marks)

9 The box plot shows information about the length of time, in minutes, some people waited to see a doctor at a hospital on Monday.



(a) Work out the interquartile range of the information in the box plot.

..... minutes

(2)

Becky says,

"50% of the people waited for at least 2 hours."

(b) Is Becky correct?
Explain why.

.....

.....

.....

(1)

The table gives information about the length of time, in minutes, some people waited to see a doctor at the same hospital on Tuesday.

	Waiting time (minutes)
Shortest time	20
Lower quartile	50
Median	100
Upper quartile	140
Longest time	210

Becky was asked to compare the distribution of the lengths of times people waited on Monday with the distribution of the lengths of times people waited on Tuesday.

She wrote,

"People had to wait longer on Tuesday than on Monday."

(c) Give **one** reason why Becky may be wrong.

.....

.....

.....

(1)

(Total for Question 9 is 4 marks)

8 The table shows the amount of snow, in cm, that fell each day for 30 days.

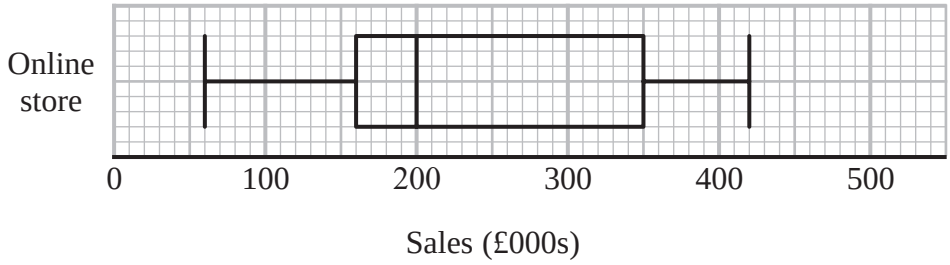
Amount of snow (s cm)	Frequency
$0 \leqslant s < 10$	8
$10 \leqslant s < 20$	10
$20 \leqslant s < 30$	7
$30 \leqslant s < 40$	2
$40 \leqslant s < 50$	3

Work out an estimate for the mean amount of snow per day.

..... cm

(Total for Question 8 is 3 marks)

10 The box plot shows information about the sales, in thousands of pounds (£000s), of an online store each month.



Andrew says,

> "Three quarters of the given data lies between 160 000 and 350 000 because these are the values of the lower quartile and the upper quartile."

Andrew is wrong.

(a) Explain why.

.....

.....

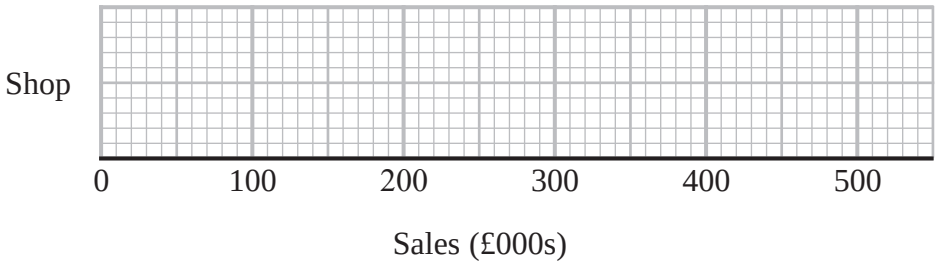
.....

(1)

The table shows information about the sales, in £000s, in a shop each month.

	Sales (£000s)
least value	30
lower quartile	80
median	170
upper quartile	260
greatest value	350

(b) On the grid below, draw a box plot for this information.



(2)

(c) Compare the distribution of the sales of the online store with the distribution of the sales in the shop.

.....

.....

.....

.....

.....

.....

(2)

(Total for Question 10 is 5 marks)

8 There are 30 women and 20 men at a gym.

The mean height of all 50 people is 167.6 cm
The mean height of the 20 men is 182 cm

Work out the mean height of the 30 women.

..... cm

(Total for Question 8 is 3 marks)

9 The cumulative frequency table gives information about the ages of 80 people working for a company.

Age (a years)	Cumulative frequency
$20 < a \leqslant 30$	20
$20 < a \leqslant 40$	48
$20 < a \leqslant 50$	64
$20 < a \leqslant 60$	75
$20 < a \leqslant 70$	80

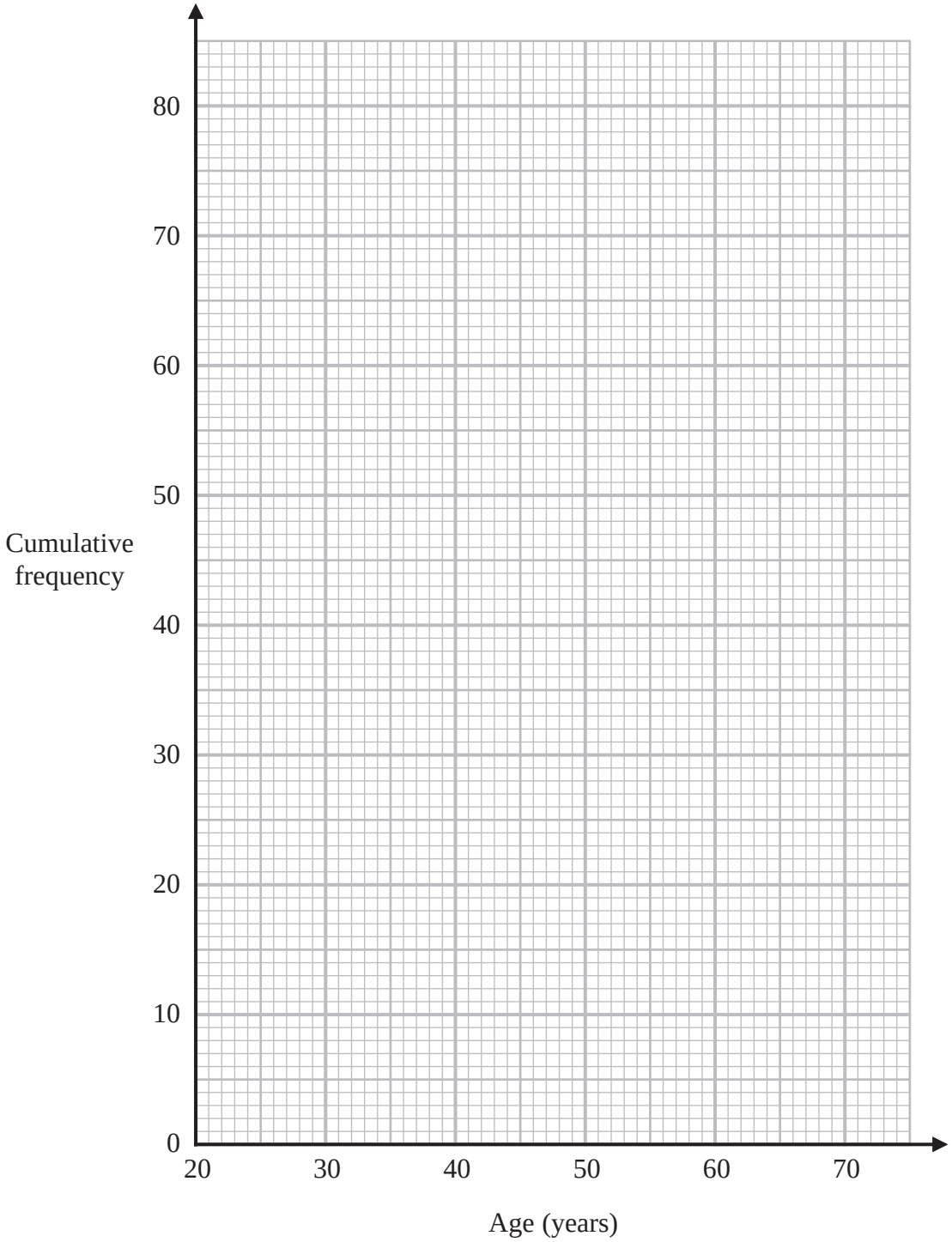
(a) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

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

..... years

(1)

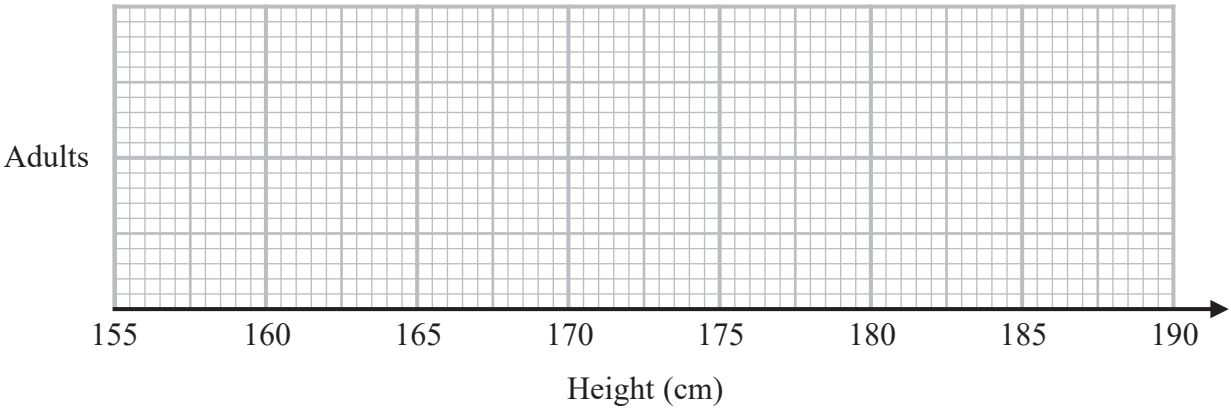


(Total for Question 9 is 3 marks)

11 The table shows some information about the heights of a group of adults.

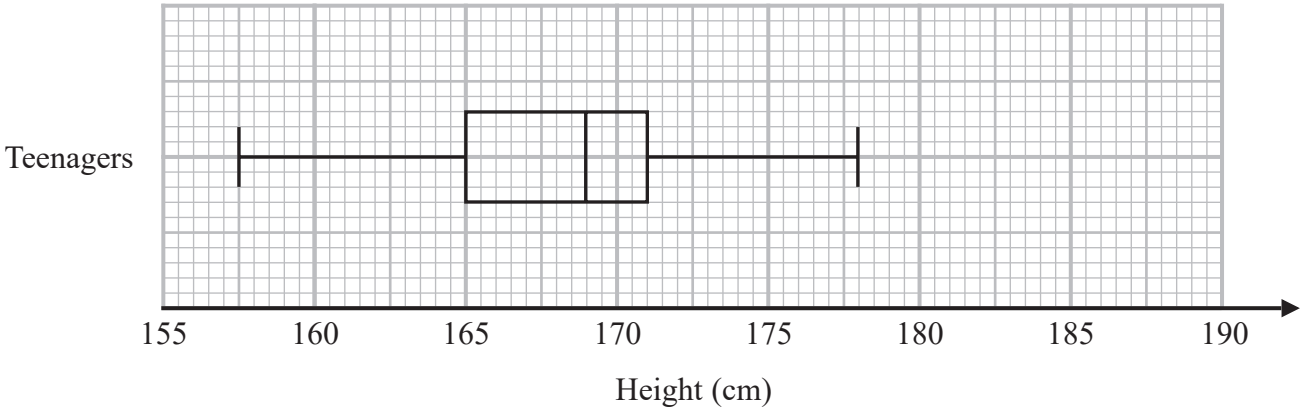
least height	169 cm
greatest height	186 cm
median	177 cm
lower quartile	174 cm
upper quartile	180 cm

(a) On the grid, draw a box plot for the information in the table.



(3)

The box plot below shows the distribution of the heights of a group of teenagers.



(b) Compare the distribution of the heights of the adults with the distribution of the heights of the teenagers.

.....

.....

.....

.....

(2)

(Total for Question 11 is 5 marks)

4 The mean length of 5 sticks is 4.2 cm.

Nawal measured the length of one of the sticks as 7 cm.

(a) Work out the mean length of the other 4 sticks.

..... cm

(3)

Nawal made a mistake.
The stick was not 7 cm long.
It was 17 cm long.

(b) How does this affect your answer to part (a)?

.....

.....

.....

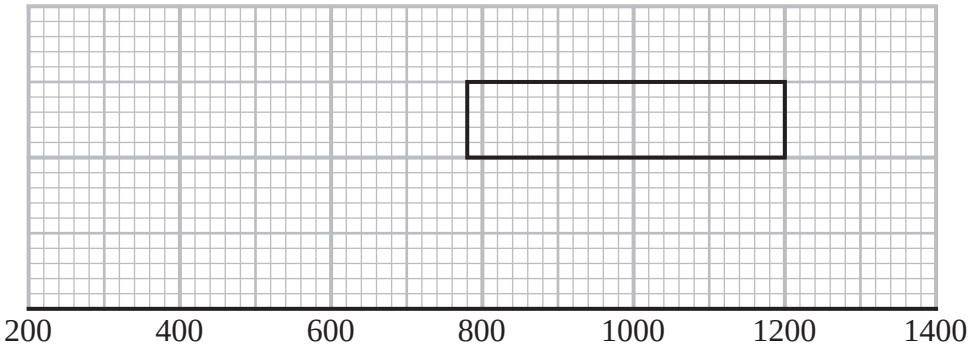
(1)

(Total for Question 4 is 4 marks)

11 Alice recorded the number of cars going into a village on each of 80 days.

The incomplete table and the incomplete box plot give information about her results.

	Number of cars
Least number	300
Lower quartile	
Median	900
Upper quartile	
Range	1000



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

(ii) Use the information in the box plot to complete the table.

(3)

On some of these 80 days Alice saw fewer than 1200 cars going into the village.

(b) Work out an estimate for the number of days Alice saw fewer than 1200 cars going into the village.

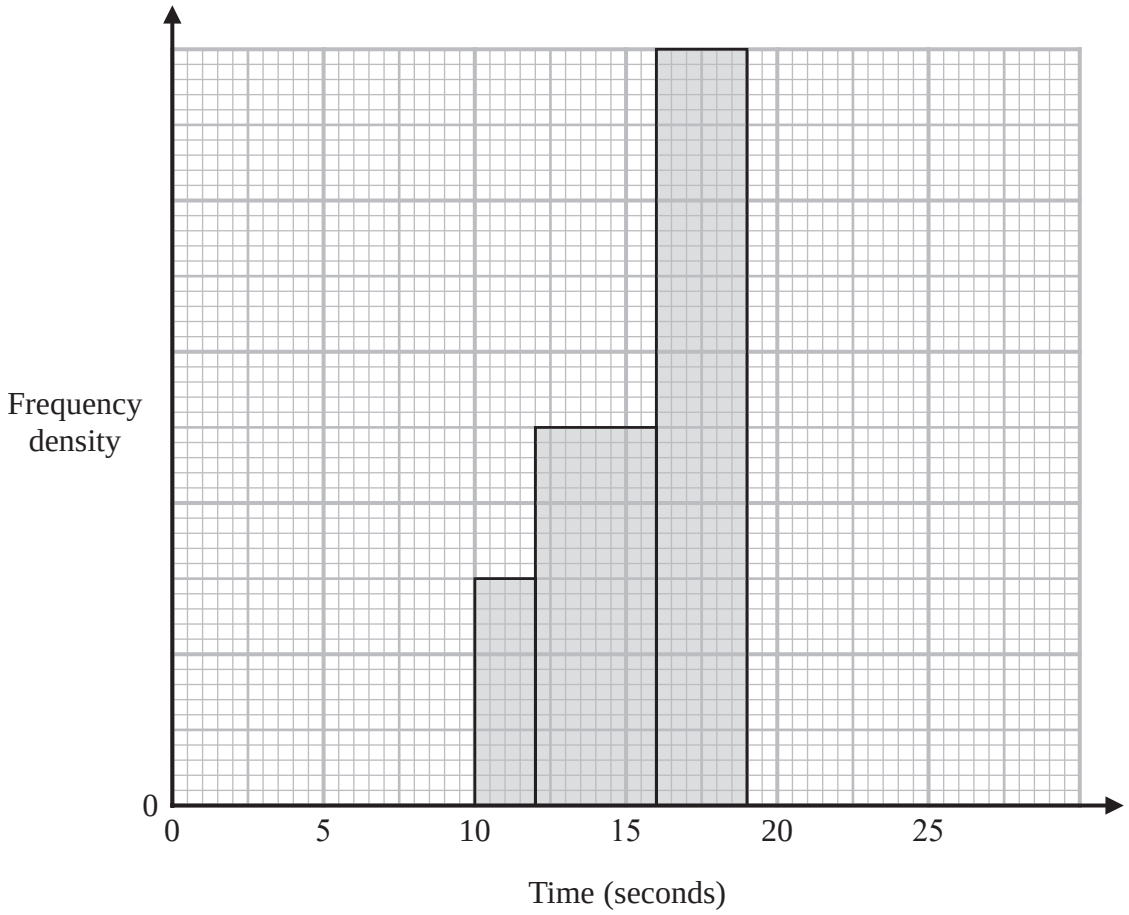
.....

(2)

(Total for Question 11 is 5 marks)

15 The incomplete table and the incomplete histogram give information about the times taken by some students to run a race.

Time (t seconds)	Frequency
$10 < t \leqslant 12$	
$12 < t \leqslant 16$	10
$16 < t \leqslant 19$	15
$19 < t \leqslant 21$	9
$21 < t \leqslant 26$	7



None of these students had a time for the race such that $t \leqslant 10$ or $t > 26$

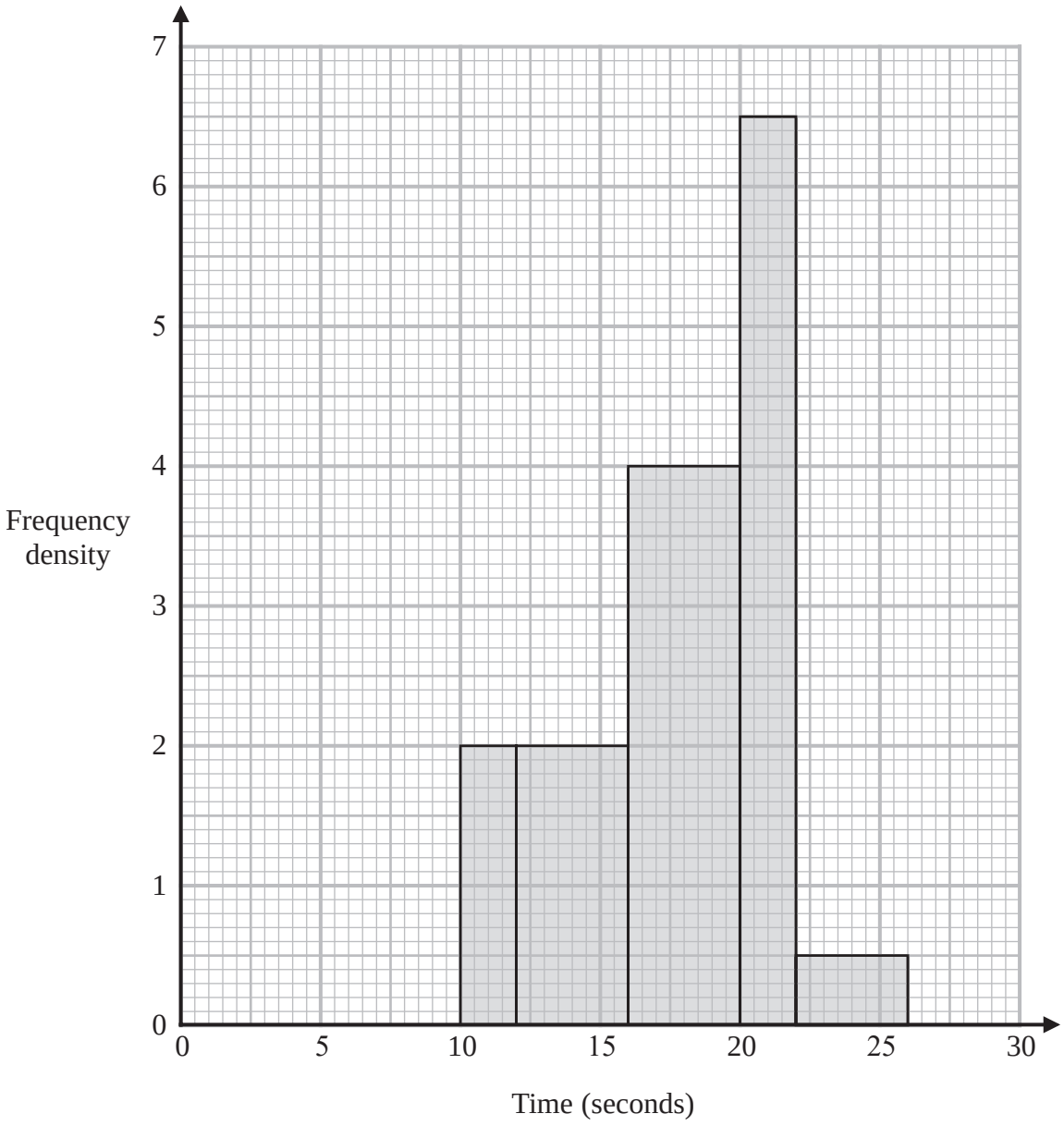
(a) Use the histogram to complete the table.

(1)

(b) Use the table to complete the histogram.

(2)

The histogram below gives information about the times taken by 43 students to run a different race.



(c) Work out an estimate for the median of the times taken by these 43 students to run the race.

..... seconds

(3)

(Total for Question 15 is 6 marks)

3 Seija works at a weather station.
The table gives information about the temperature, T °C, at midday for each of 50 cities in the UK on Tuesday.

Temperature (T °C)	Frequency
$10 < T \leqslant 15$	2
$15 < T \leqslant 20$	8
$20 < T \leqslant 25$	13
$25 < T \leqslant 30$	21
$30 < T \leqslant 35$	6

(a) Calculate an estimate for the mean temperature.

.....°C
(3)

Seija says,

> "The median temperature is 22.5 °C because 22.5 is the middle number in the middle group."

(b) Is Seija correct?
Give a reason for your answer.

.....

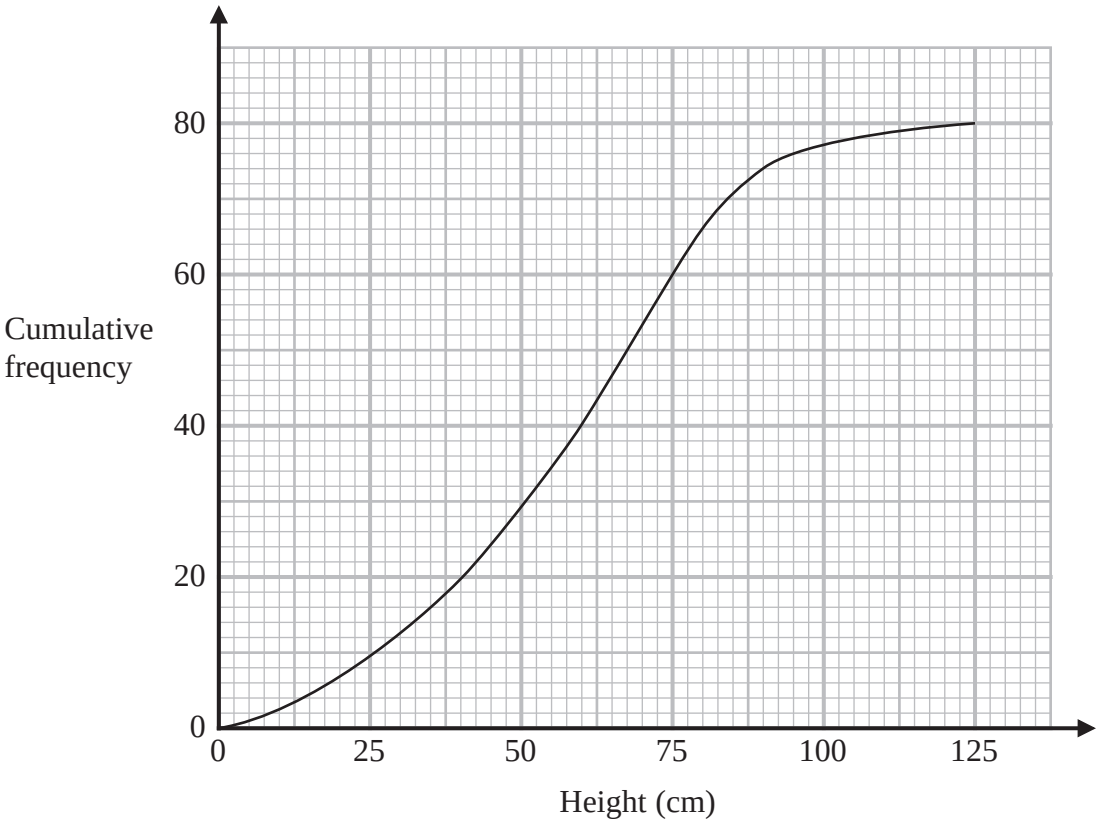
.....

.....

(1)

(Total for Question 3 is 4 marks)

13 Alan grew 80 plants of the same type outside.
The cumulative frequency graph shows information about the heights, in cm, of these plants.



One of the plants is chosen at random.

(a) Find an estimate for the probability that this plant will have a height greater than 90 cm.

.....

(2)

(b) Use the graph to find an estimate for the median height.

..... cm

(1)

(c) Use the graph to find an estimate for the interquartile range of the heights.

..... cm

(2)

Alan also grew plants of the same type inside.

The interquartile range of the heights of these plants is 30 cm.

(d) Give one comparison between the distribution of the heights of the plants grown inside with the distribution of the heights of the plants grown outside.

.....

.....

.....

.....

(1)

(Total for Question 13 is 6 marks)

8 Len has 8 parcels.

The mean weight of the 8 parcels is 2.5 kg.
The mean weight of 3 of the parcels is 2 kg.

Work out the mean weight of the other 5 parcels.

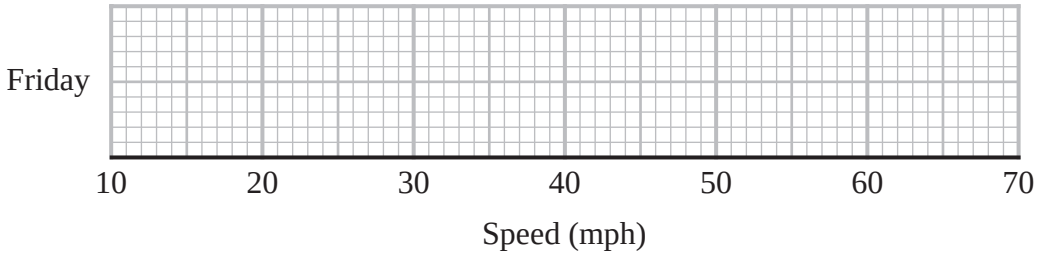
..... kg

(Total for Question 8 is 3 marks)

11 Mina records the speeds, in mph, of some cars on a road on Friday.
She uses her results to work out the information in this table.

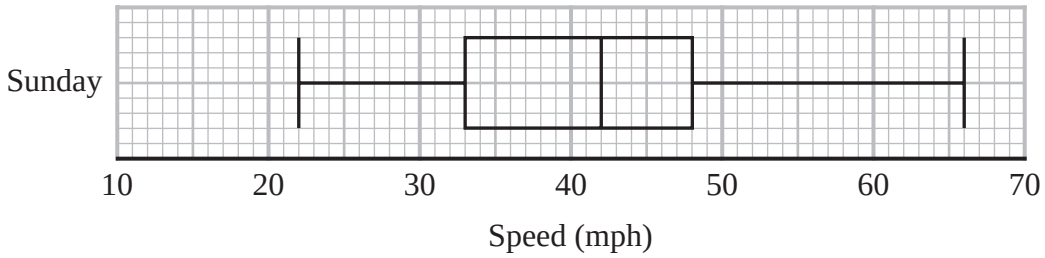
	Speed (mph)
Lowest speed	25
Lower quartile	35
Median	40
Interquartile range	12
Range	37

(a) On the grid, draw a box plot to show the information in the table.



(3)

Mina also records the speeds of some cars on the same road on Sunday.
She uses her results to draw this box plot.



(b) Compare the distribution of the speeds on Friday with the distribution of the speeds on Sunday.

.....

.....

.....

.....

(2)

(Total for Question 11 is 5 marks)

6 The stem and leaf diagram shows the test scores of 23 students from School **A**.

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

Key:
3 | 0 represents 30

23 students from School **B** did the same test.

Their median score was 56
The range of their scores was 47

Compare the distribution of the test scores of the students from School **A** with the distribution of the test scores of the students from School **B**.

(Total for Question 6 is 4 marks)

6 Here are two lists of numbers.

List **A**	276	400	157	139		
List **B**	530	500	270	x	440	320

mean of list **A** : mean of list **B** = 3 : 5

Work out the value of x.

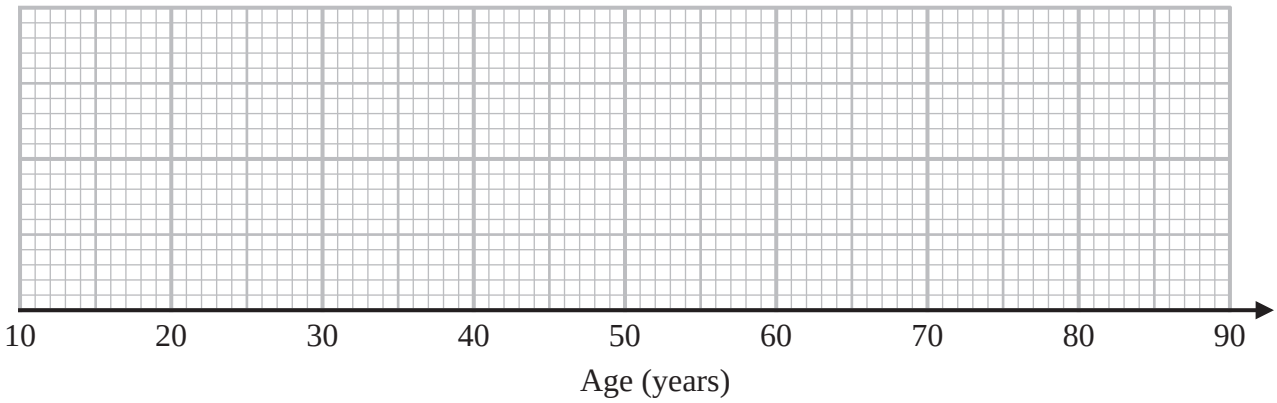
x = ...

(Total for Question 6 is 5 marks)

12 The table gives some information about the ages, in years, of 32 actors.

Lowest age	21
Highest age	80
Lower quartile	31
Upper quartile	42
Median	35

(a) Draw a box plot to represent this information.



(3)

(b) Work out an estimate for the number of these actors with an age between 31 years and 42 years.

.....

(1)

Mary says,

"At least one of the actors is 35 years old because the median is 35"

(c) Is Mary correct?
Give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 12 is 5 marks)