

- 11 The manager of a call centre asked the 120 people, who rang the call centre last week, how long they each waited before their call was answered.

The table gives information about their replies.

Time waited (t minutes)	Frequency
$0 < t \leq 5$	8
$5 < t \leq 10$	15
$10 < t \leq 15$	17
$15 < t \leq 20$	28
$20 < t \leq 25$	33
$25 < t \leq 30$	19

- (a) Complete the cumulative frequency table.

Time waited (t minutes)	Cumulative frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	
$0 < t \leq 30$	

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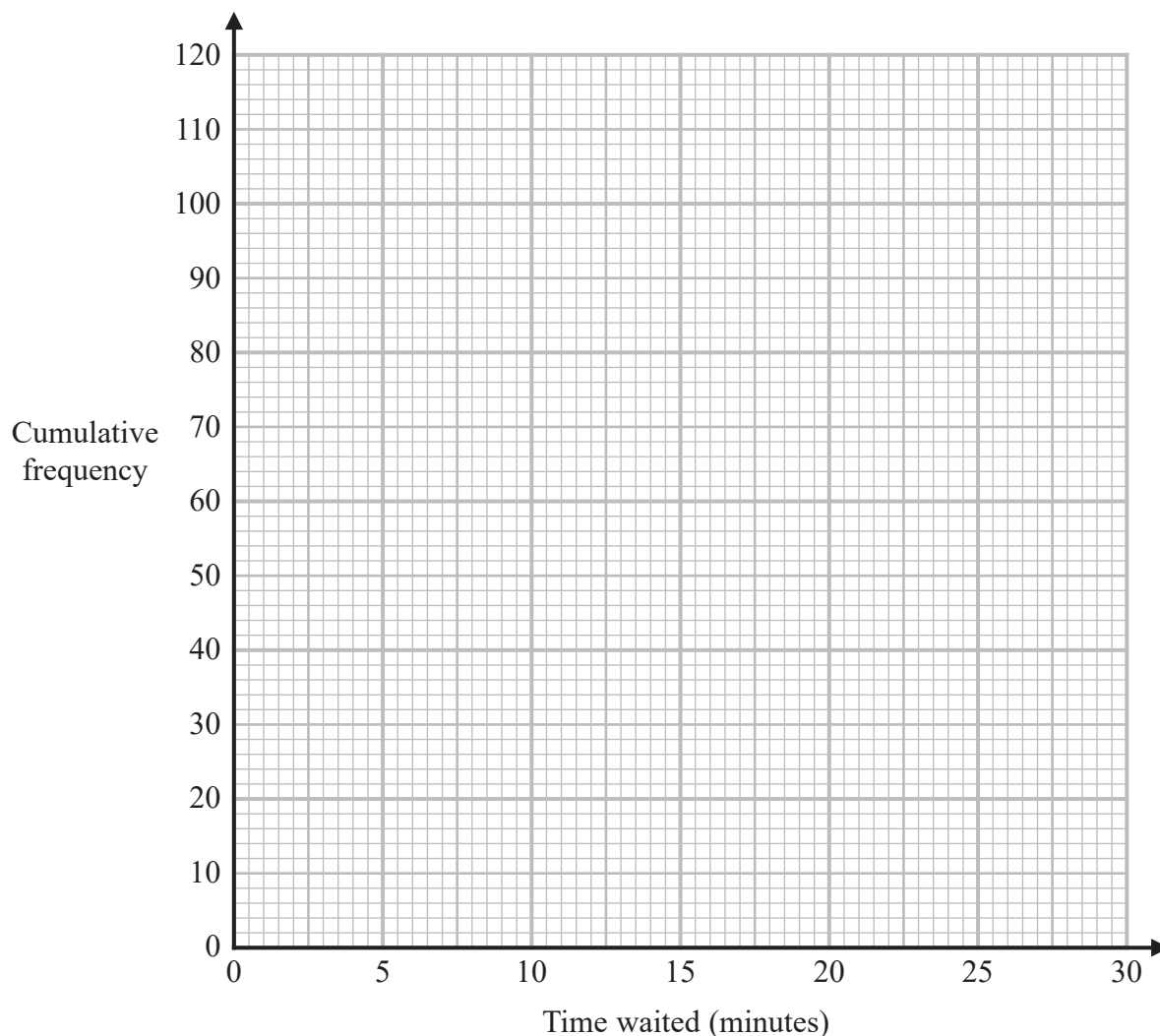
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(b) On the grid below, draw a cumulative frequency graph for your table.



(2)

(c) Use your graph to find an estimate for the median of the times waited.

..... minutes
(1)

(d) Using your graph, find an estimate for the percentage of the 120 people who said that they waited longer than 23 minutes before their call was answered.
Show your working clearly.

..... %
(2)

(Total for Question 11 is 6 marks)



- 13 The table gives information about the times taken, in minutes, for 80 taxi journeys.

Time taken (t minutes)	Frequency
$0 < t \leq 5$	7
$5 < t \leq 10$	10
$10 < t \leq 15$	12
$15 < t \leq 20$	19
$20 < t \leq 25$	18
$25 < t \leq 30$	14

- (a) Complete the cumulative frequency table.

Time taken (t minutes)	Cumulative frequency
$0 < t \leq 5$	
$0 < t \leq 10$	
$0 < t \leq 15$	
$0 < t \leq 20$	
$0 < t \leq 25$	
$0 < t \leq 30$	

(1)

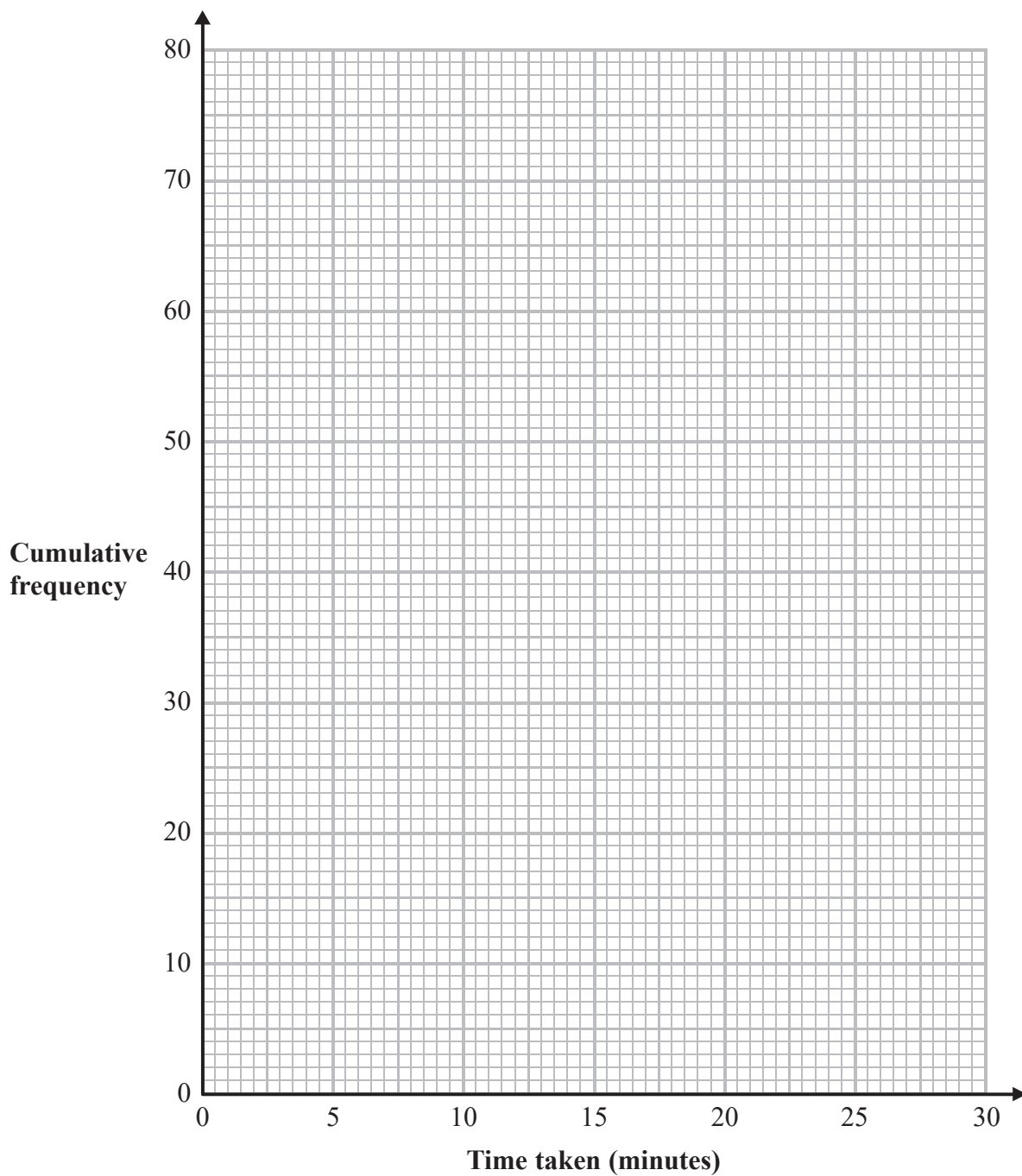
- (b) On the grid opposite, draw a cumulative frequency graph for your table.

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(2)

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

.....minutes
(1)

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

.....minutes
(2)

(Total for Question 13 is 6 marks)



13 The table gives information about the ages, in years, of 80 people in a train carriage.

Age (a years)	Frequency
$0 < a \leq 20$	7
$20 < a \leq 30$	25
$30 < a \leq 40$	20
$40 < a \leq 50$	14
$50 < a \leq 60$	8
$60 < a \leq 70$	6

(a) Complete the cumulative frequency table.

Age (a years)	Cumulative frequency
$0 < a \leq 20$	
$0 < a \leq 30$	
$0 < a \leq 40$	
$0 < a \leq 50$	
$0 < a \leq 60$	
$0 < a \leq 70$	

(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 of the 80 people.

..... years

(1)

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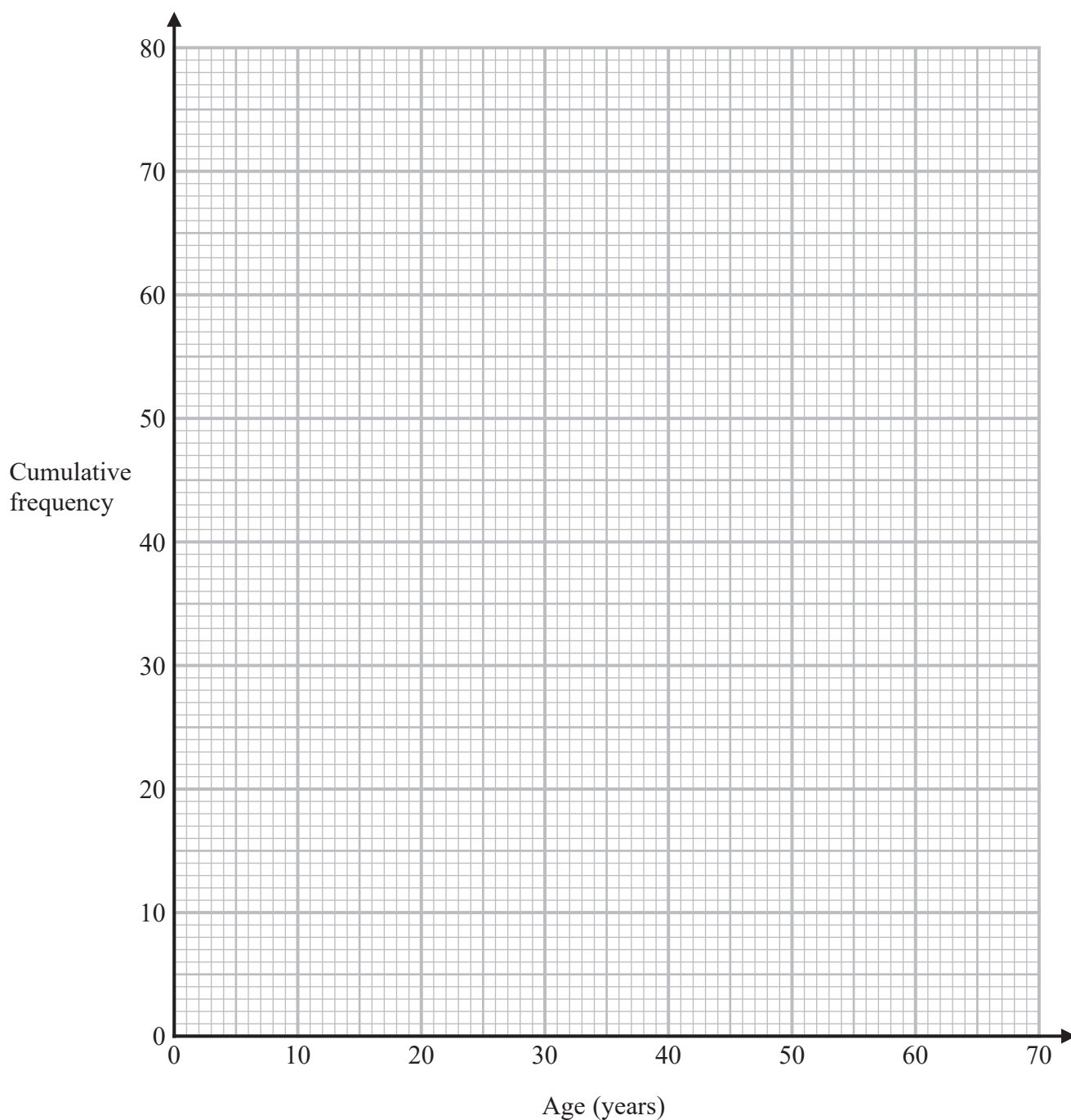
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Of the people in the train carriage, 60% of those who are aged between 18 and 65 are going to work. None of the other people in the train carriage are going to work.

- (d) Use your graph to find an estimate for the number of people in the train carriage who are going to work.

(3)

(Total for Question 13 is 7 marks)



11 The frequency table gives information about the ages of the 80 people in a train carriage.

Age (a years)	Frequency
$0 < a \leq 20$	9
$20 < a \leq 30$	19
$30 < a \leq 40$	17
$40 < a \leq 50$	18
$50 < a \leq 60$	13
$60 < a \leq 70$	4

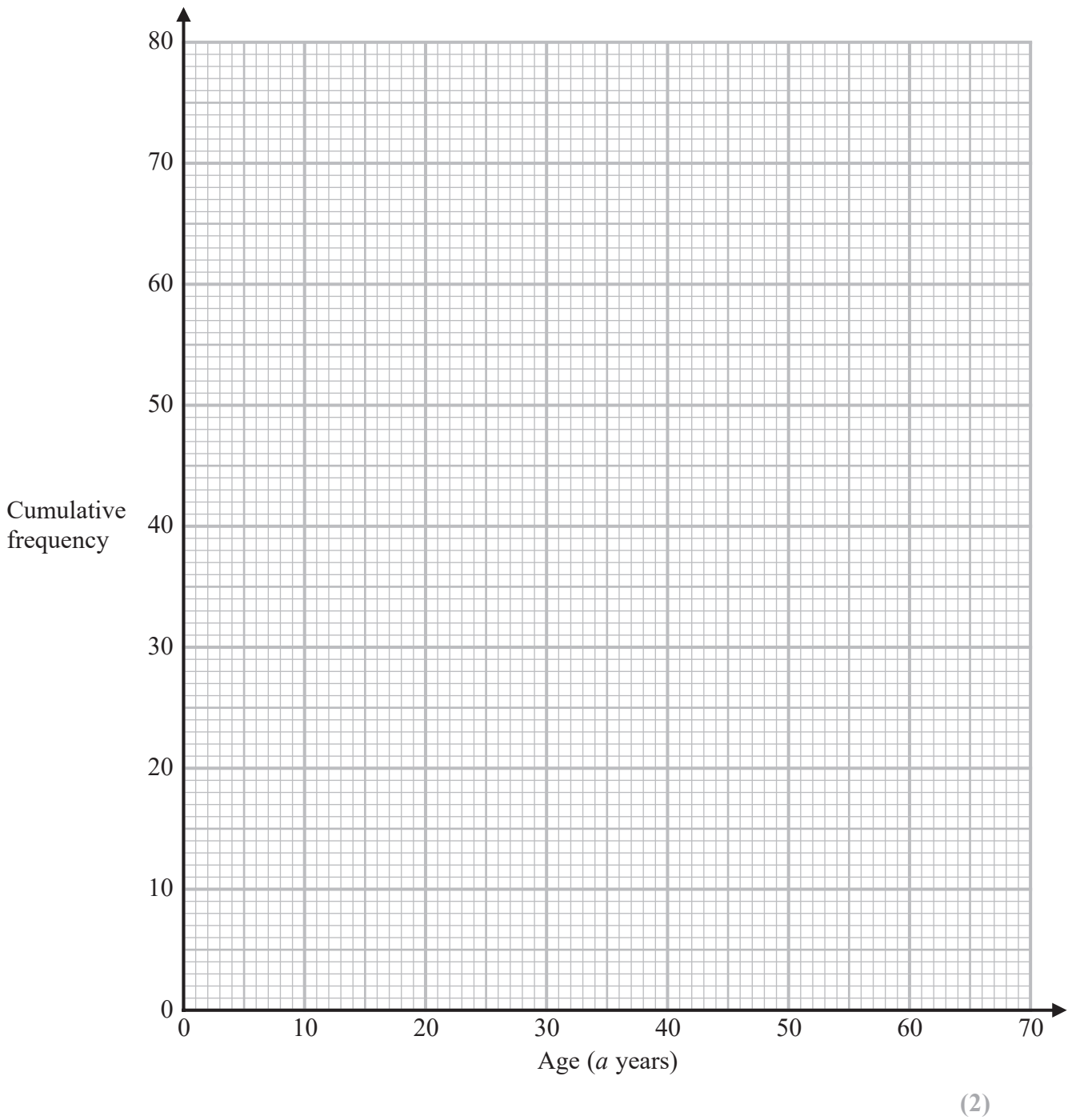
(a) Complete the cumulative frequency table.

Age (a years)	Cumulative frequency
$0 < a \leq 20$	
$0 < a \leq 30$	
$0 < a \leq 40$	
$0 < a \leq 50$	
$0 < a \leq 60$	
$0 < a \leq 70$	

(1)



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



(c) Use your graph to find an estimate for the median age of the people in the train carriage.

..... years

(2)

(Total for Question 11 is 5 marks)



- 12 The table gives information about the times, in minutes, taken by 80 customers to do their shopping in a supermarket.

Time taken (t minutes)	Frequency
$0 < t \leq 10$	7
$10 < t \leq 20$	26
$20 < t \leq 30$	24
$30 < t \leq 40$	14
$40 < t \leq 50$	7
$50 < t \leq 60$	2

- (a) Complete the cumulative frequency table.

Time taken (t minutes)	Cumulative frequency
$0 < t \leq 10$	
$0 < t \leq 20$	
$0 < t \leq 30$	
$0 < t \leq 40$	
$0 < t \leq 50$	
$0 < t \leq 60$	

(1)

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

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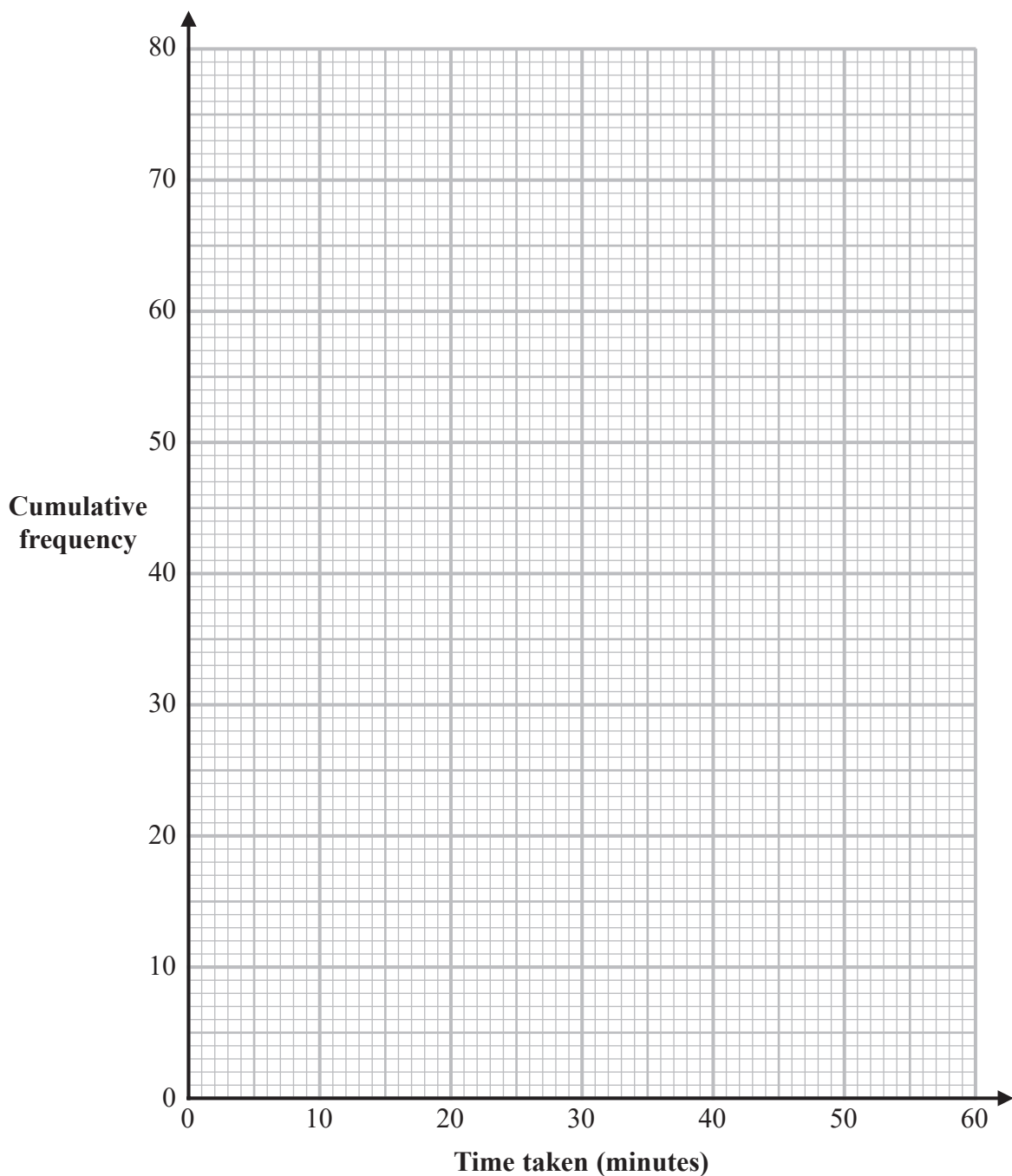
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(2)

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

..... minutes

(1)

One of the 80 customers is chosen at random.

(d) Use your graph to find an estimate for the probability that the time taken by this customer was more than 42 minutes.

.....

(2)

(Total for Question 12 is 6 marks)



9 The table shows information about the speeds of 60 cycles.

Speed (s km/h)	Frequency
$0 < s \leq 10$	3
$10 < s \leq 20$	16
$20 < s \leq 30$	24
$30 < s \leq 40$	10
$40 < s \leq 50$	5
$50 < s \leq 60$	2

(a) Complete the cumulative frequency table.

Speed (s km/h)	Cumulative frequency
$0 < s \leq 10$	
$0 < s \leq 20$	
$0 < s \leq 30$	
$0 < s \leq 40$	
$0 < s \leq 50$	
$0 < s \leq 60$	

(1)

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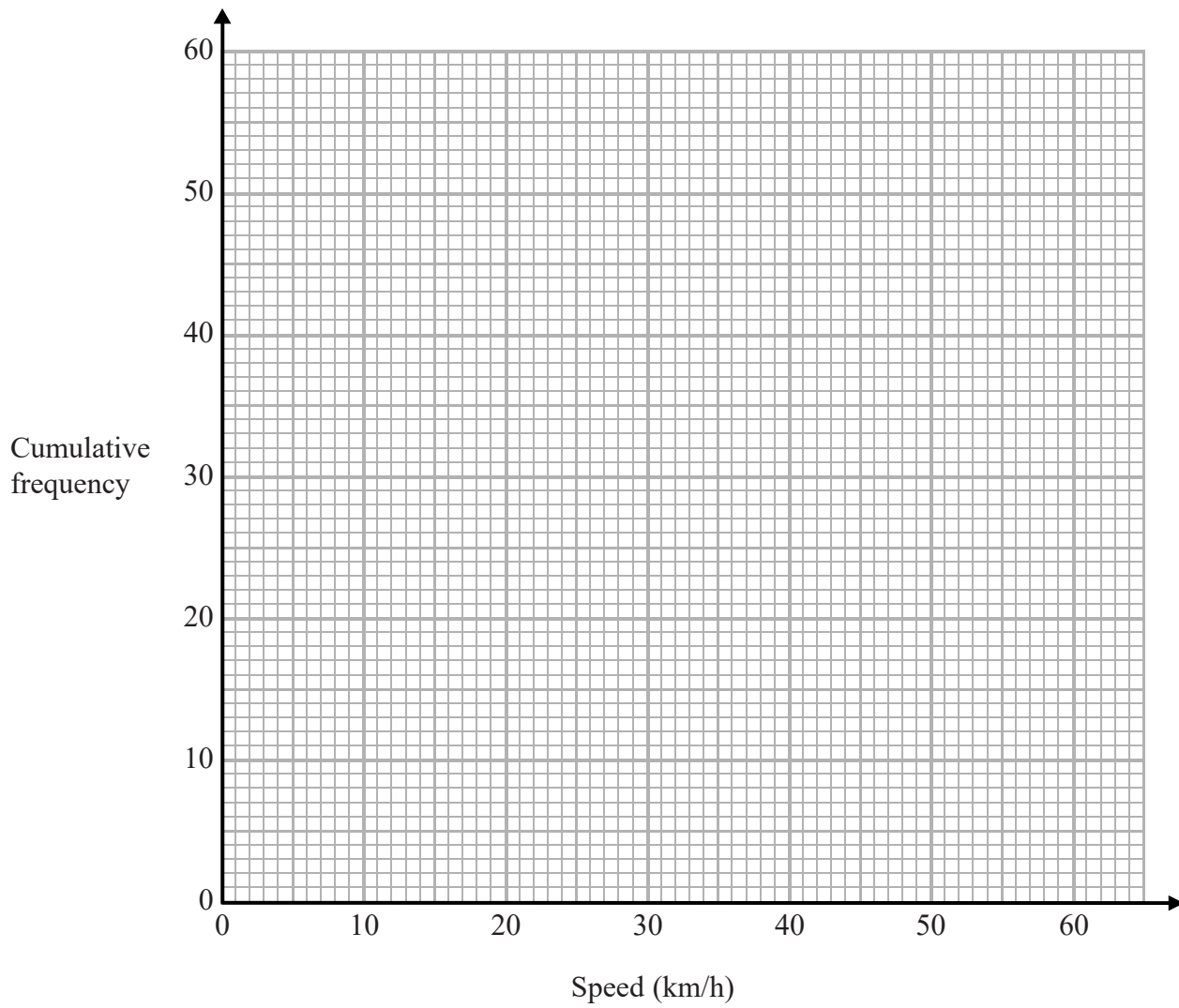
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(b) On the grid, draw a cumulative frequency graph for your table.



(2)

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

..... km/h

(2)

(Total for Question 9 is 5 marks)



P 5 9 0 1 7 A 0 1 3 2 8

11 The table shows information about the amount of money spent on holiday by each of 120 families.

Money spent (£ <i>m</i>)	Frequency
$0 < m \leq 100$	10
$100 < m \leq 200$	36
$200 < m \leq 300$	34
$300 < m \leq 400$	20
$400 < m \leq 500$	15
$500 < m \leq 600$	5

(a) Write down the modal class.

(1)

(b) Complete the cumulative frequency table for the information in the table.

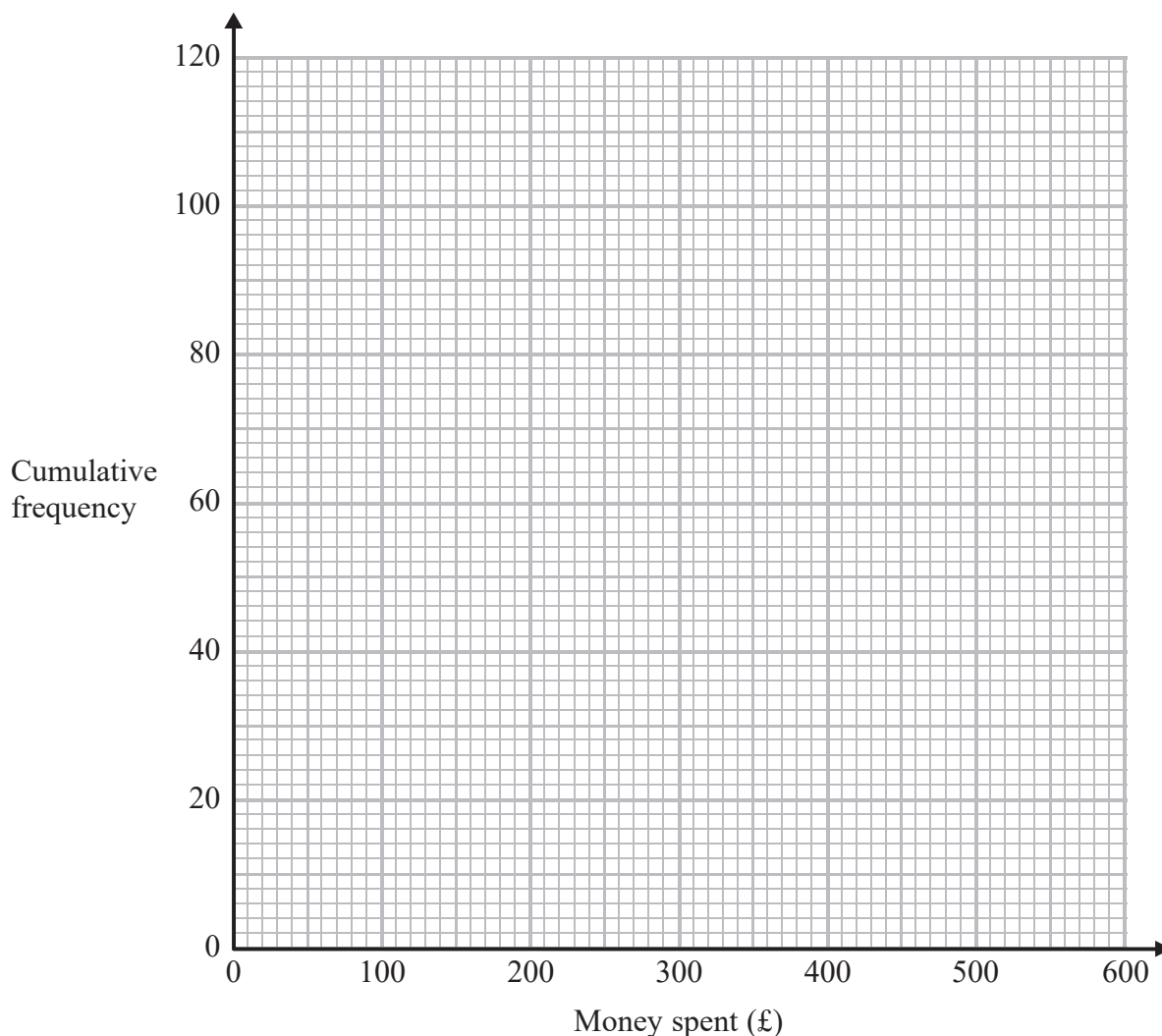
Money spent (£ <i>m</i>)	Cumulative frequency
$0 < m \leq 100$	
$0 < m \leq 200$	
$0 < m \leq 300$	
$0 < m \leq 400$	
$0 < m \leq 500$	
$0 < m \leq 600$	

(1)



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

(2)



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

£.....

(2)

(e) Use your graph to find an estimate for the number of families that spent more than £450 on holiday.

.....

(2)

(Total for Question 11 is 8 marks)



13 The frequency table gives information about the weights, in kilograms, of 60 parcels in a delivery van.

Weight (w kilograms)	Frequency
$0 < w \leq 1$	4
$1 < w \leq 2$	15
$2 < w \leq 3$	20
$3 < w \leq 4$	11
$4 < w \leq 5$	6
$5 < w \leq 6$	4

(a) Complete the cumulative frequency table.

Weight (w kilograms)	Cumulative frequency
$0 < w \leq 1$	
$0 < w \leq 2$	
$0 < w \leq 3$	
$0 < w \leq 4$	
$0 < w \leq 5$	
$0 < w \leq 6$	

(1)

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

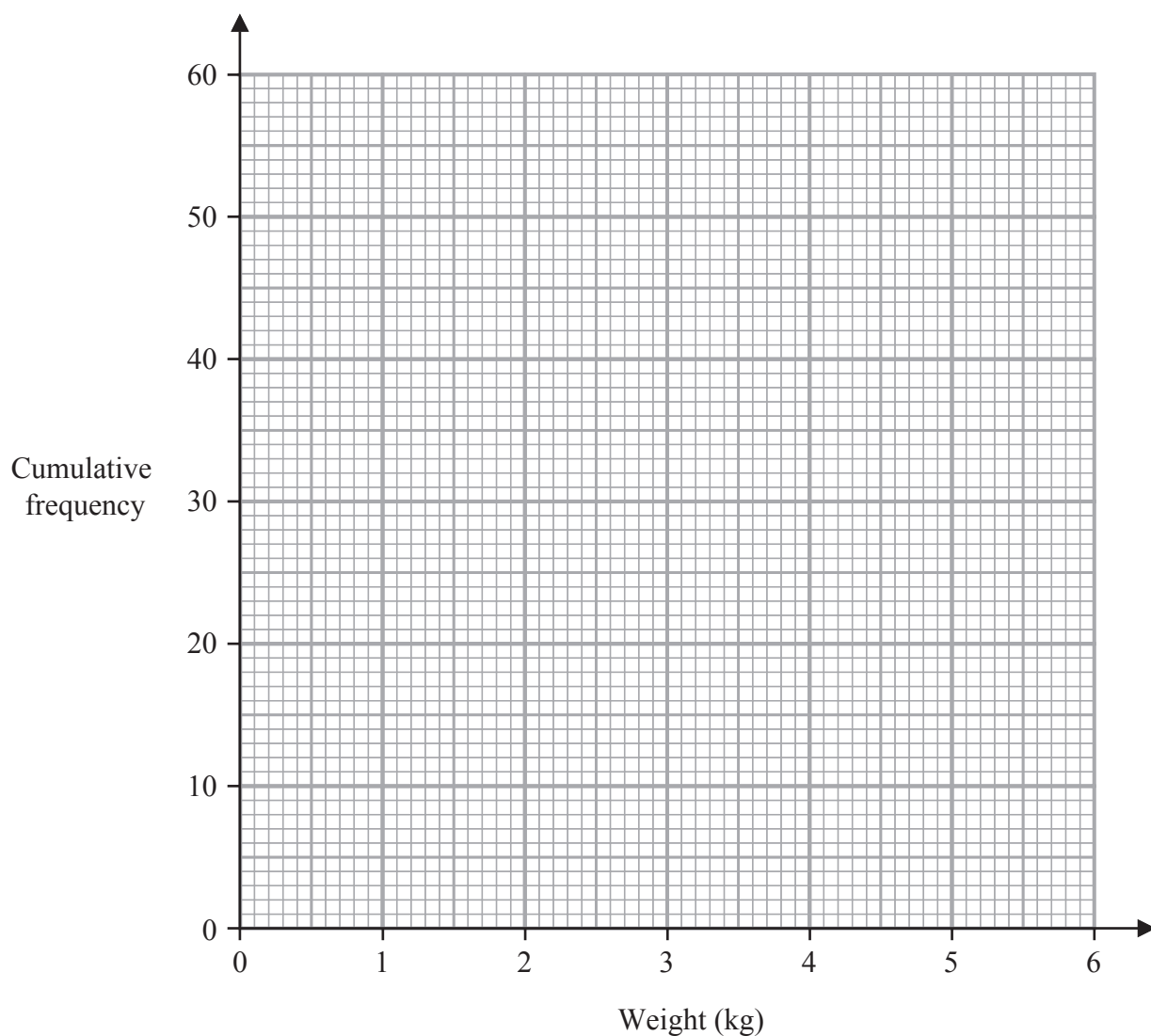
(2)



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- (c) Use your graph to find an estimate for the median weight of the 60 parcels.

..... kilograms
(1)

- (d) Use your graph to find an estimate for the number of these parcels that weigh more than 3.7 kilograms.

.....
(2)

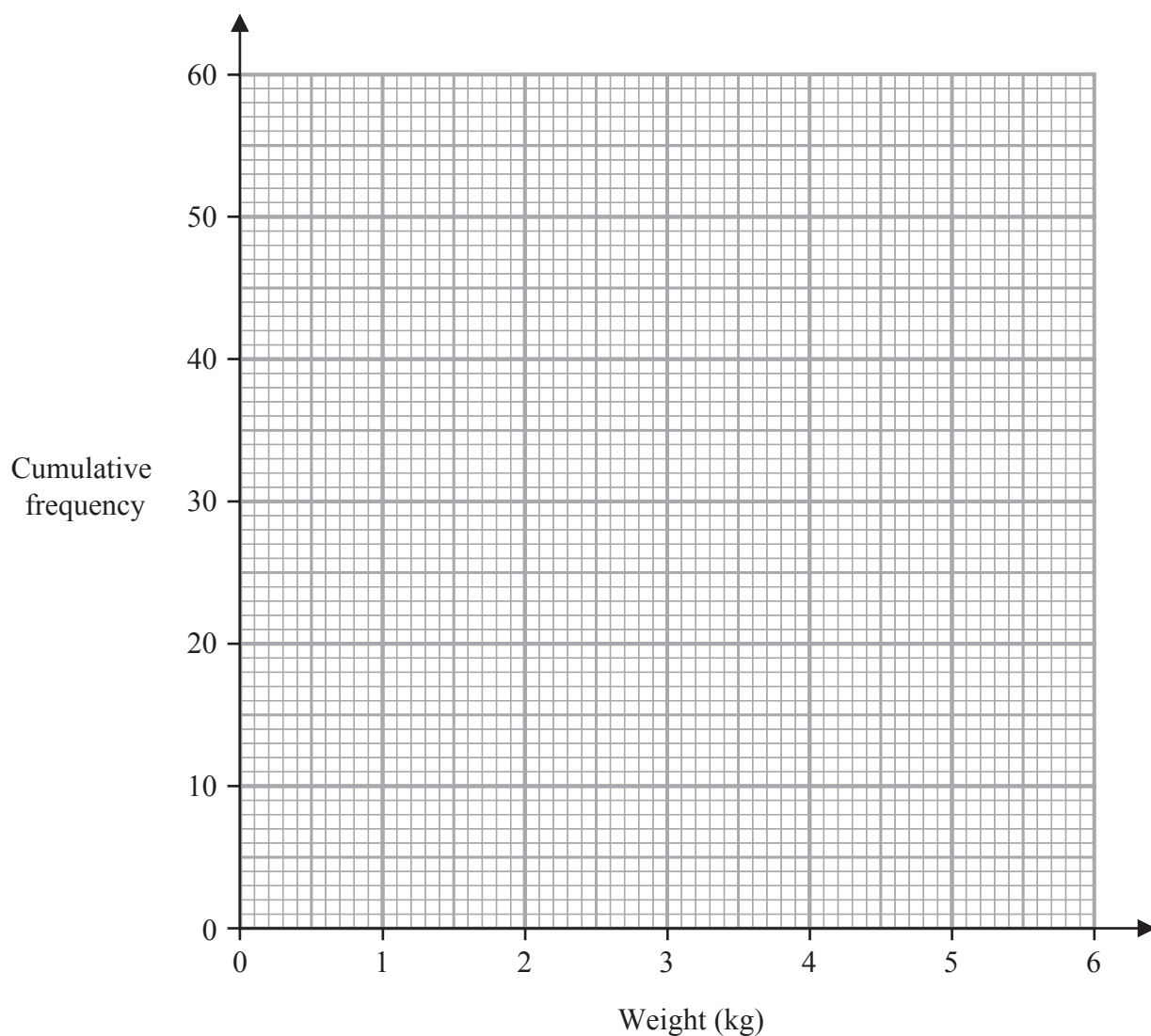
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- (c) Use your graph to find an estimate for the median weight of the 60 parcels.

..... kilograms
(1)

- (d) Use your graph to find an estimate for the number of these parcels that weigh more than 3.7 kilograms.

.....
(2)

(Total for Question 13 is 6 marks)



- 10 The table shows information about the number of minutes each of 120 buses was late last Monday.

Number of minutes late (L)	Frequency
$0 < L \leq 10$	10
$10 < L \leq 20$	16
$20 < L \leq 30$	44
$30 < L \leq 40$	29
$40 < L \leq 50$	15
$50 < L \leq 60$	6

- (a) Complete the cumulative frequency table below.

Number of minutes late (L)	Cumulative frequency
$0 < L \leq 10$	
$0 < L \leq 20$	
$0 < L \leq 30$	
$0 < L \leq 40$	
$0 < L \leq 50$	
$0 < L \leq 60$	

(1)

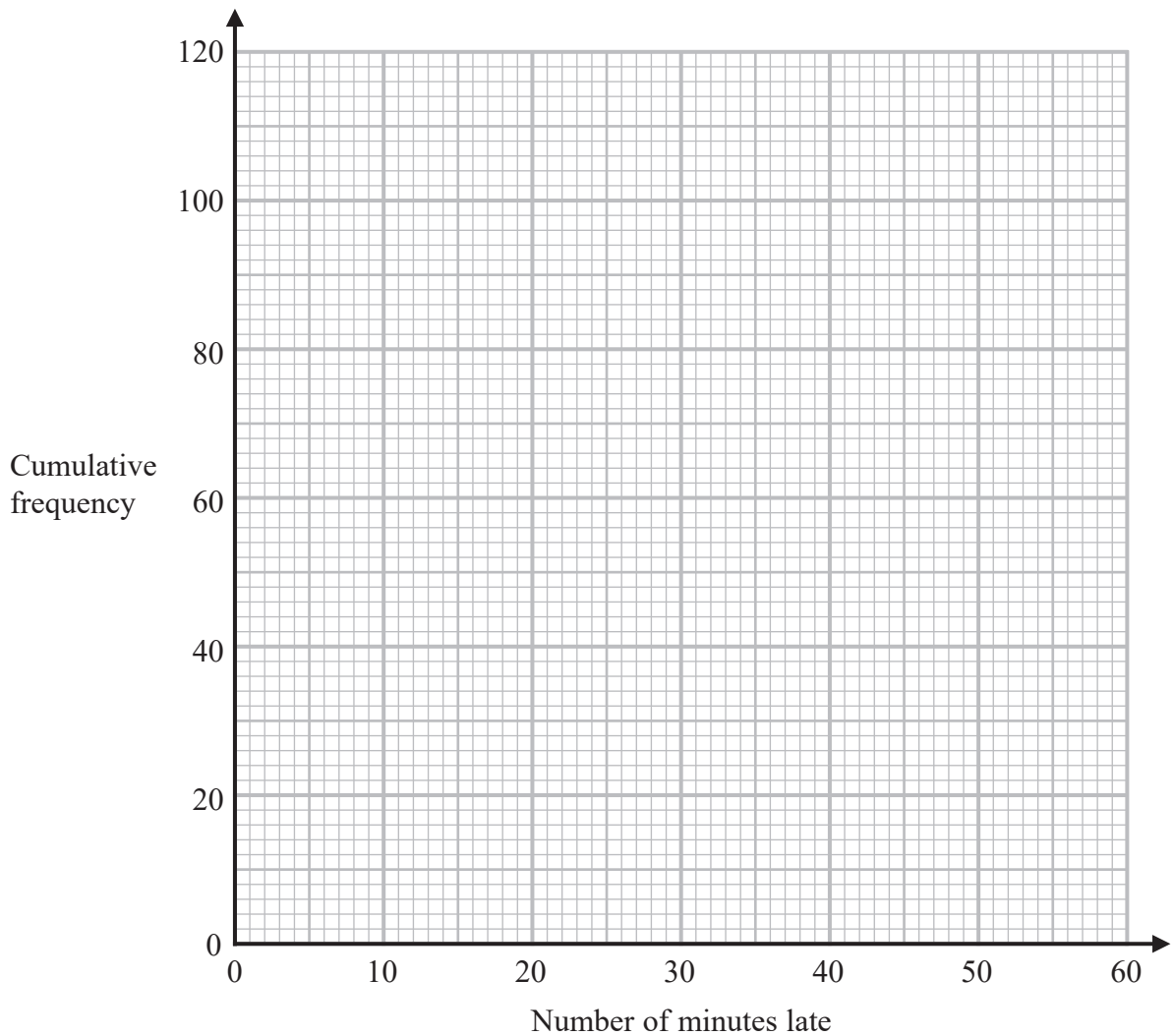
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(b) On the grid, draw a cumulative frequency graph for your table.



(2)

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

.....minutes

(2)

(d) Use your graph to find an estimate for the number of buses that were more than 48 minutes late last Monday.

.....

(2)

(Total for Question 10 is 7 marks)



- 11 The table gives information about the times taken by 90 runners to complete a 10 km race.

Time (t minutes)	Frequency
$25 < t \leq 35$	12
$35 < t \leq 45$	24
$45 < t \leq 55$	28
$55 < t \leq 65$	12
$65 < t \leq 75$	10
$75 < t \leq 85$	4

- (a) Complete the cumulative frequency table.

Time (t minutes)	Cumulative frequency
$25 < t \leq 35$	12
$25 < t \leq 45$	
$25 < t \leq 55$	
$25 < t \leq 65$	
$25 < t \leq 75$	
$25 < t \leq 85$	

(1)

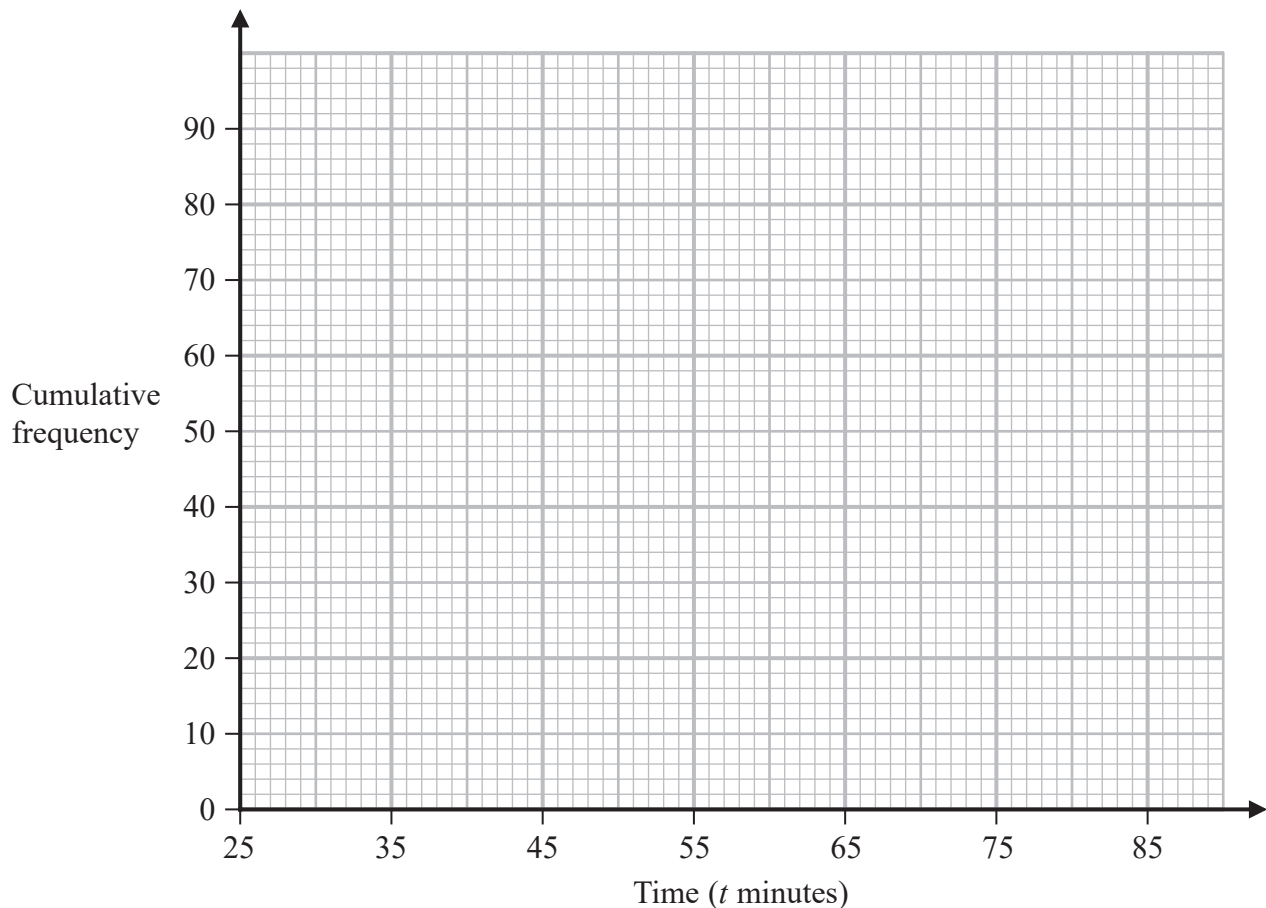
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(b) On the grid below, draw a cumulative frequency graph for your table.



(2)

Any runner who completed the race in a time T minutes such that $42 < T \leq 52$ minutes was awarded a silver medal.

(c) Use your graph to find an estimate for the number of runners who were awarded a silver medal.

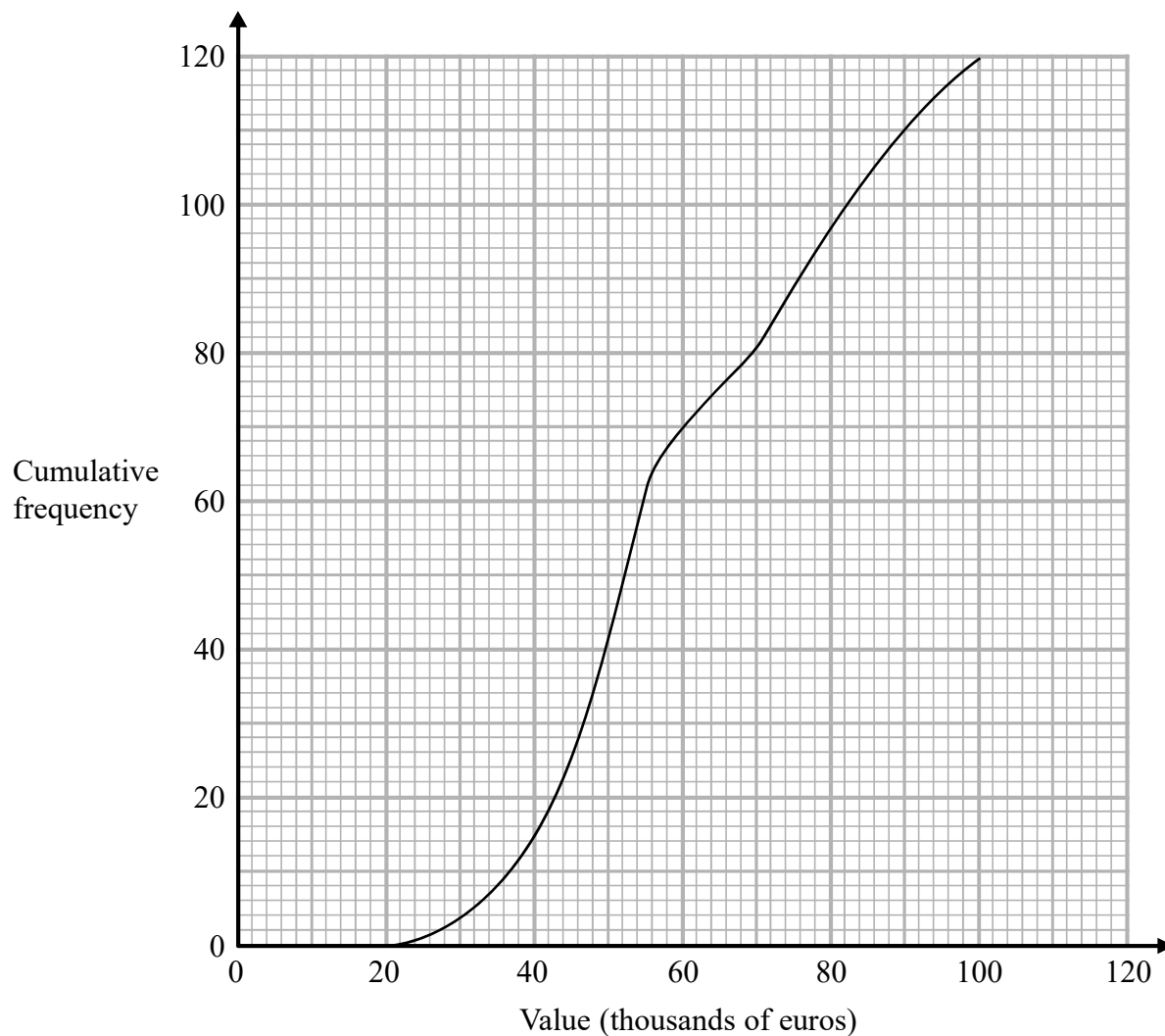
..... runners

(2)

(Total for Question 11 is 5 marks)



- 14 The cumulative frequency diagram gives information about the values, in thousands of euros, of 120 apartments in 2015



- (a) Find an estimate for the number of these apartments with a value of 80 thousand euros or less in 2015

(1)

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The table gives information about the values, in thousands of euros, of the same 120 apartments in 2018

Value in thousands of euros (v)	Cumulative frequency
$0 < v \leq 20$	0
$0 < v \leq 40$	15
$0 < v \leq 60$	44
$0 < v \leq 80$	85
$0 < v \leq 100$	102
$0 < v \leq 120$	120

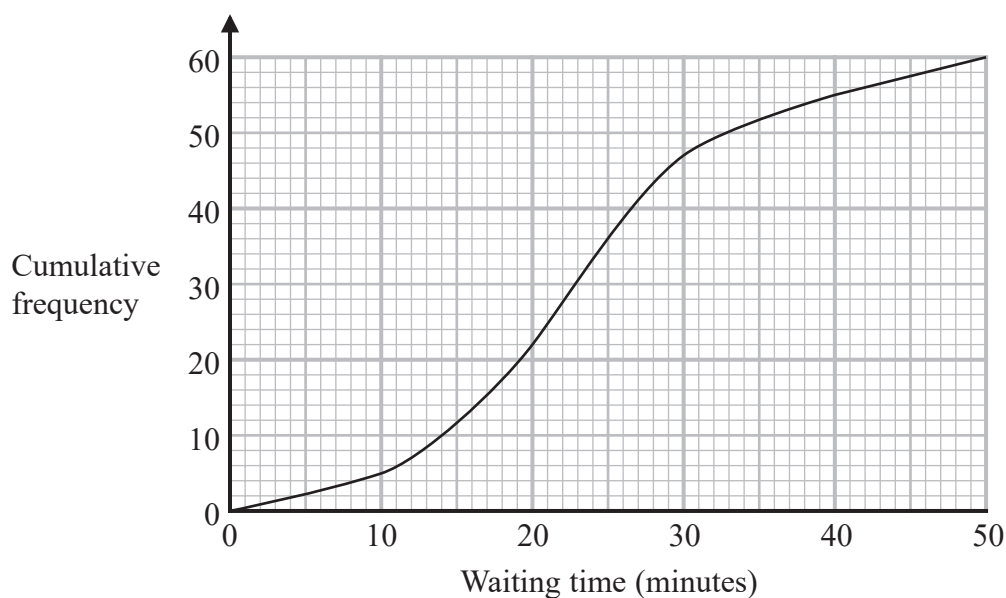
- (b) On the grid opposite, draw a cumulative frequency diagram for this information. (2)
- (c) Find an estimate for the increase in the median value for these apartments from 2015 to 2018

.....thousand euros
(2)

(Total for Question 14 is 5 marks)



- 12 The cumulative frequency graph gives information about the waiting times, in minutes, of people with appointments at Hospital A.



- (a) Use the graph to find an estimate of the median waiting time at Hospital A.

..... minutes
(1)

- (b) Use the graph to find an estimate of the interquartile range of the waiting times at Hospital A.

..... minutes
(2)

At a different hospital, Hospital B, the median waiting time is 28 minutes and the interquartile range of the waiting times is 19 minutes.

- (c) Compare the waiting times at Hospital A with the waiting times at Hospital B.

.....

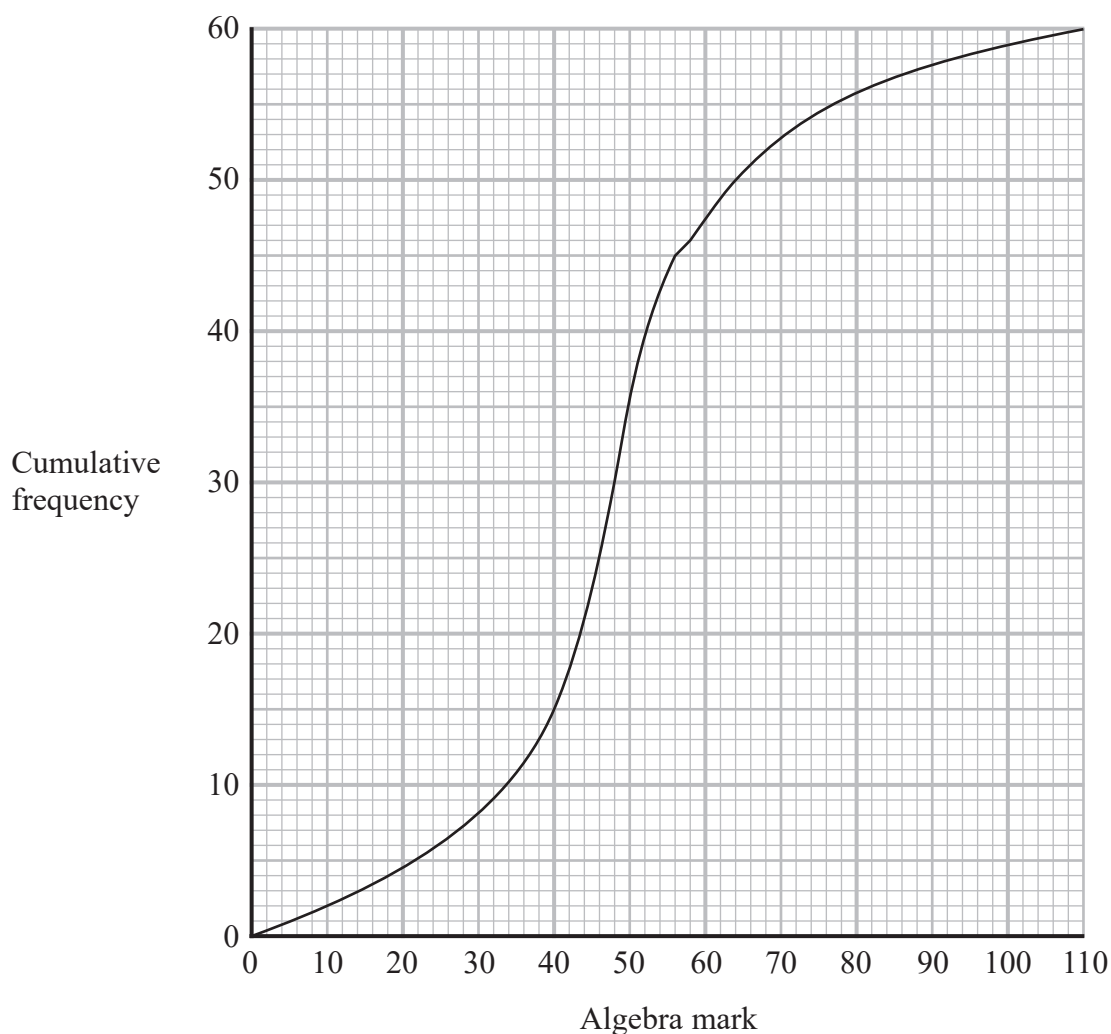
 (2)

(Total for Question 12 is 5 marks)



- 14 A group of 60 students each sat an algebra test and a geometry test.
Each test was marked out of 110

The cumulative frequency graph gives information about the marks gained by the 60 students in the algebra test.



- (a) Use the graph to find an estimate for the median mark in the algebra test.

.....
(1)

- (b) Use the graph to find an estimate for the number of students who gained 58 marks or less in the algebra test.

.....
(1)



- (c) Use the graph to find an estimate for the interquartile range of the marks gained in the algebra test.

.....
(2)

The interquartile range of the marks gained in the geometry test is 9

Luis says

“The students’ marks are more spread out in the algebra test than in the geometry test.”

- (d) Is Luis correct?
Give a reason for your answer.

.....
(1)

To be awarded a grade A in the algebra test, a student had to gain a mark greater than 64

Two students are to be selected at random from the 60 students in the group.

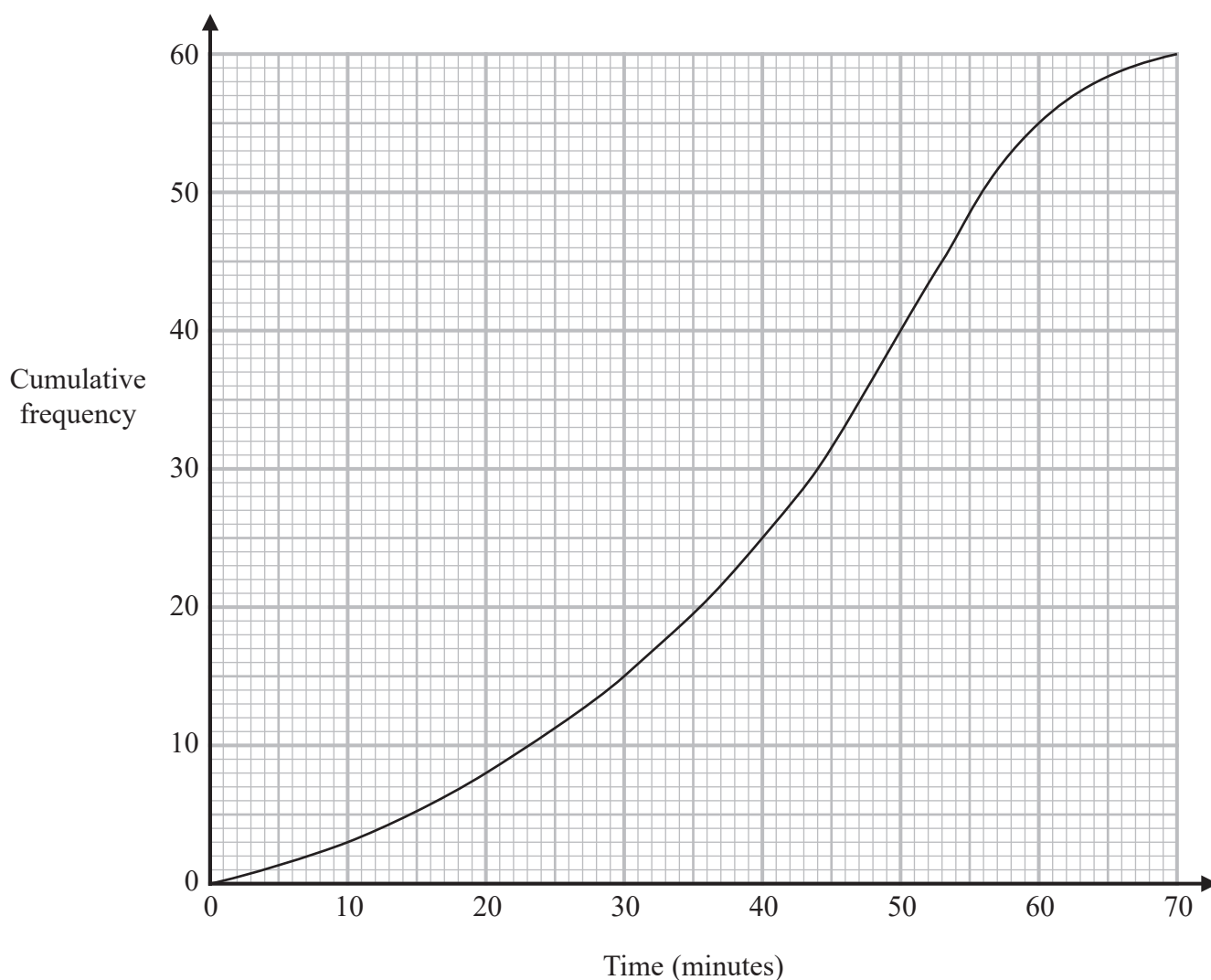
- (e) Use the graph to find an estimate for the probability that both of these students were awarded a grade A in the algebra test.

.....
(3)

(Total for Question 14 is 8 marks)



- 12 The cumulative frequency graph gives information about the time, in minutes, each of 60 people took to shop in a market.



- (a) Use the graph to find an estimate for the median time people took to shop in the market.

..... minutes
(1)

- (b) Use the graph to find an estimate for the number of people who took longer than 55 minutes to shop in the market.

.....
(2)



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(c) Use the graph to complete the frequency table to give information about the time, in minutes, each of the 60 people took to shop in the market.

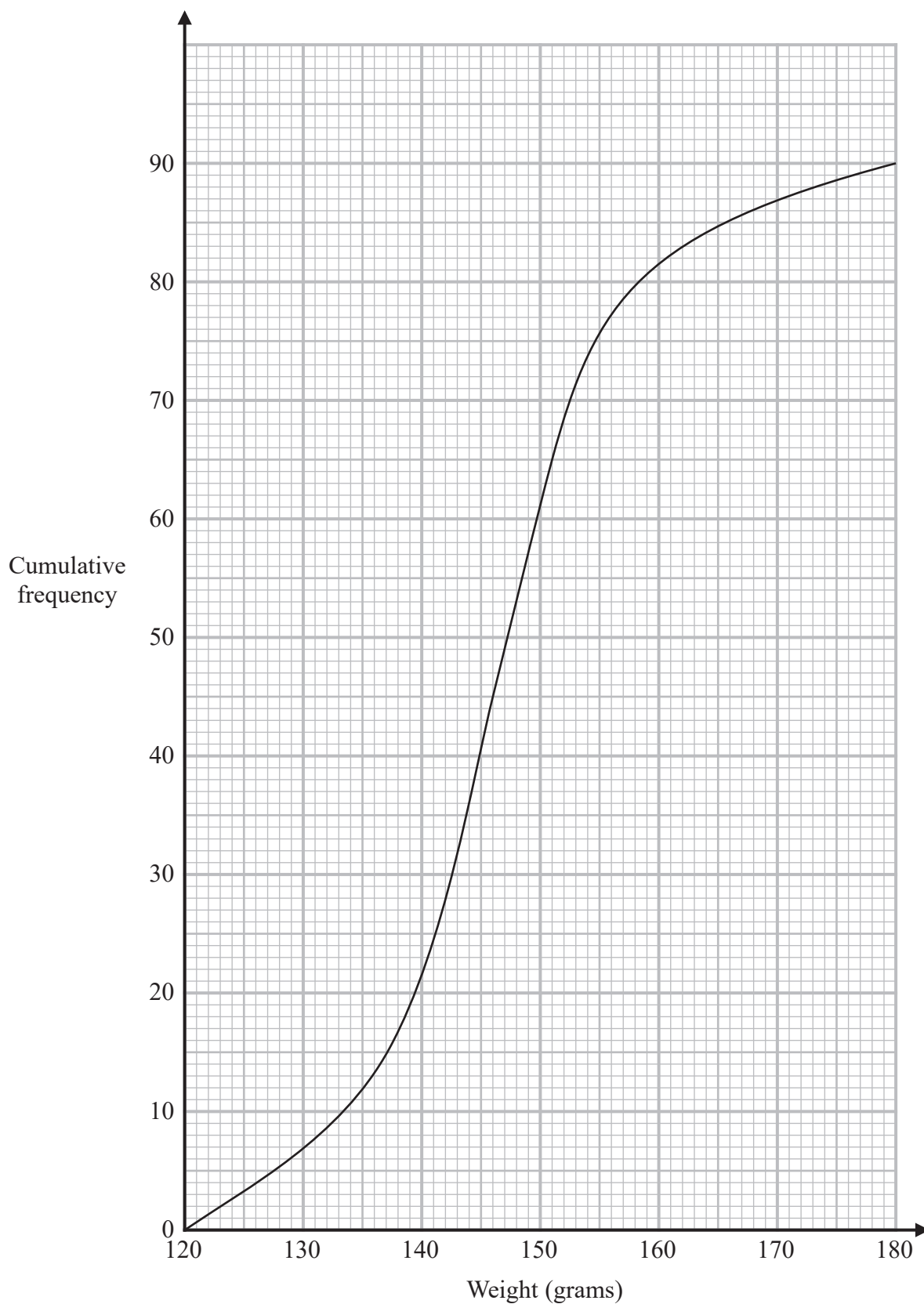
Time taken to shop in the market (m minutes)	Frequency
$0 < m \leq 10$	3
$10 < m \leq 20$	5
$20 < m \leq 30$	
$30 < m \leq 40$	
$40 < m \leq 50$	
$50 < m \leq 60$	
$60 < m \leq 70$	

(2)

(Total for Question 12 is 5 marks)



- 11 The cumulative frequency graph gives information about the weights, in grams, of 90 bags of sweets.



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- (a) Find an estimate for the median of the weights of these bags of sweets.

..... grams
(2)

Roberto sells the bags of sweets to raise money for charity.

Bags with a weight greater than d grams are labelled large bags and sold for 3.75 euros each bag.

The total amount of money he receives by selling all the large bags is 93.75 euros.

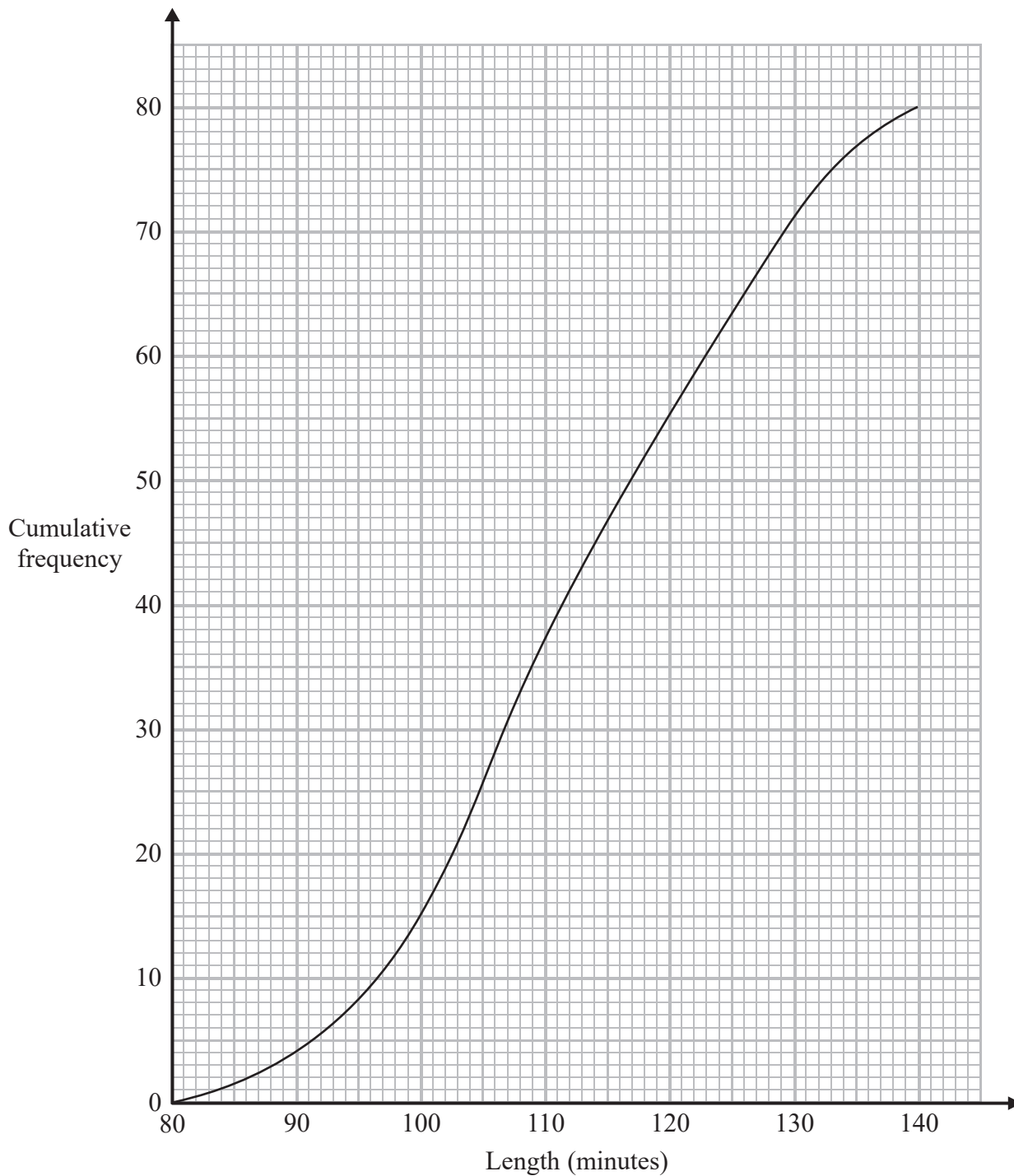
- (b) Find the value of d .

$d =$
(3)

(Total for Question 11 is 5 marks)



- 10 The cumulative frequency graph shows information about the length, in minutes, of each of 80 films.



- (a) Use the graph to find an estimate for the interquartile range.

..... minutes
(2)



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Clare says,

“More than 35% of these films are over 120 minutes long.”

(b) Is Clare correct?

Give a reason for your answer.

(3)

(Total for Question 10 is 5 marks)

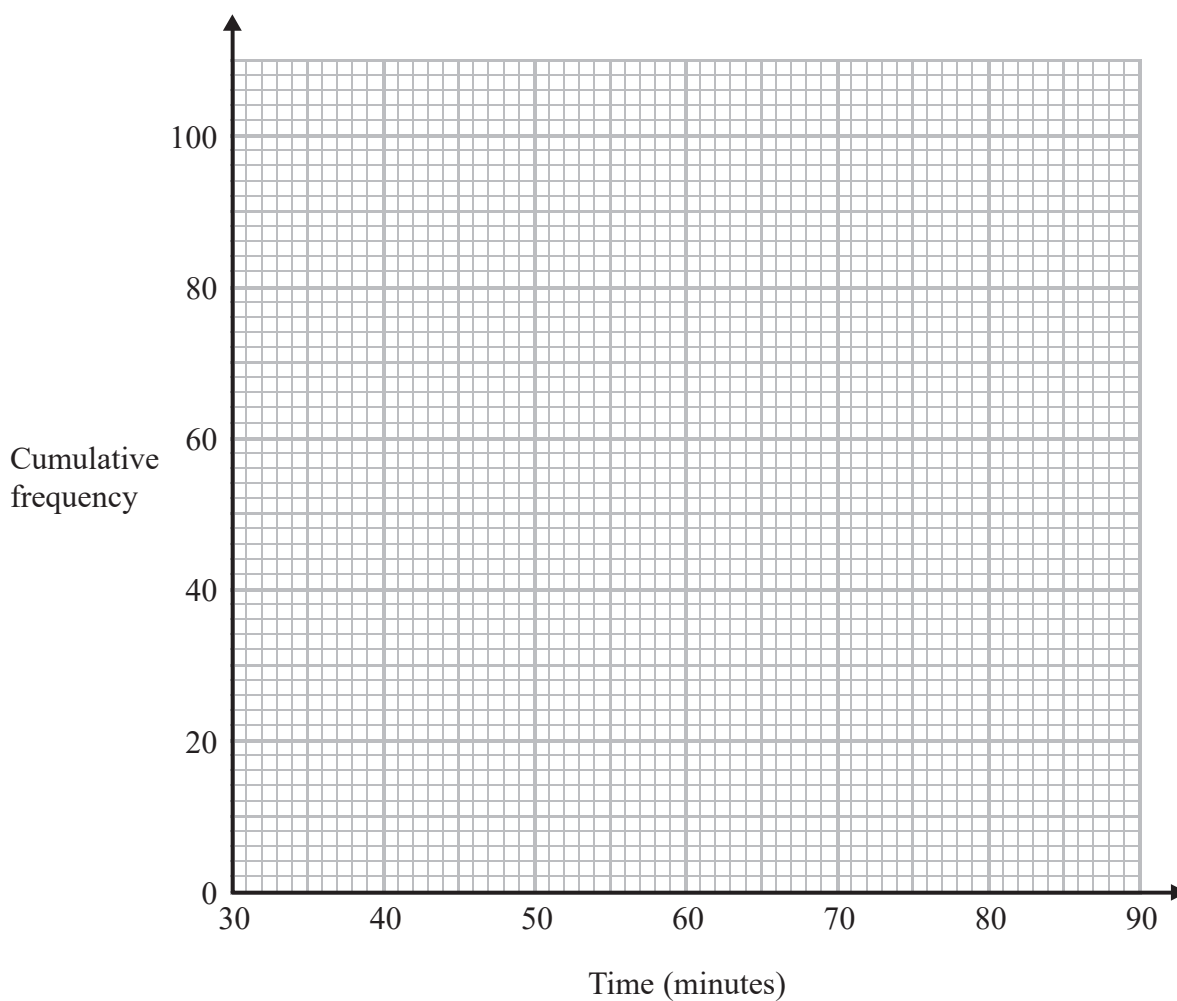


- 13 Sandeep recorded the length of time, in minutes, that each of 100 adults went for a walk one Saturday afternoon.

The cumulative frequency table gives information about these times.

Time (t minutes)	Cumulative frequency
$30 < t \leq 40$	6
$30 < t \leq 50$	20
$30 < t \leq 60$	56
$30 < t \leq 70$	84
$30 < t \leq 80$	95
$30 < t \leq 90$	100

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



(2)

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- (b) Use your graph to find an estimate for the median length of time that these adults went for a walk.

..... minutes
(2)

One of the 100 adults is chosen at random.

- (c) Use your graph to find an estimate for the probability that this adult went for a walk for more than 72 minutes.

.....
(3)

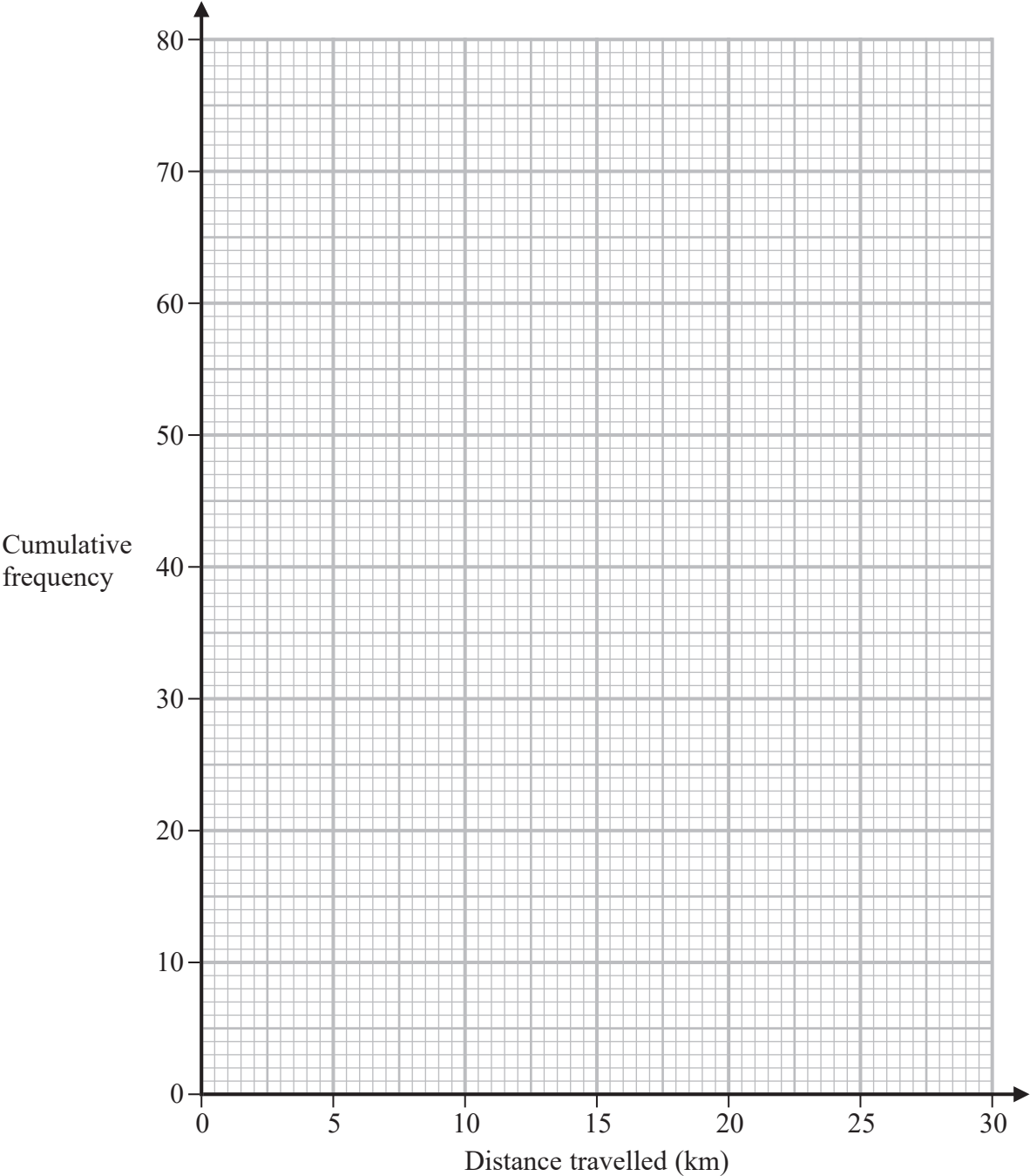
(Total for Question 13 is 7 marks)



12 The cumulative frequency table gives information about the distance, in kilometres, that each of 80 workers travel from home to work at Office *A*.

Distance travelled (<i>d</i> km)	Cumulative frequency
$0 < d \leq 5$	17
$0 < d \leq 10$	32
$0 < d \leq 15$	57
$0 < d \leq 20$	70
$0 < d \leq 25$	76
$0 < d \leq 30$	80

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



(2)



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

..... km
(1)

(c) Use your graph to find an estimate for the interquartile range of the distances travelled.

..... km
(2)

For Office *B*, the median distance workers travel from home to work is 15 km and the interquartile range is 5 km.

(d) Use the information above to compare the distances that workers at Office *A* and workers at Office *B* travel from home to work.
Write down **two** comparisons.

1.....

.....

.....

2.....

.....

.....

(2)

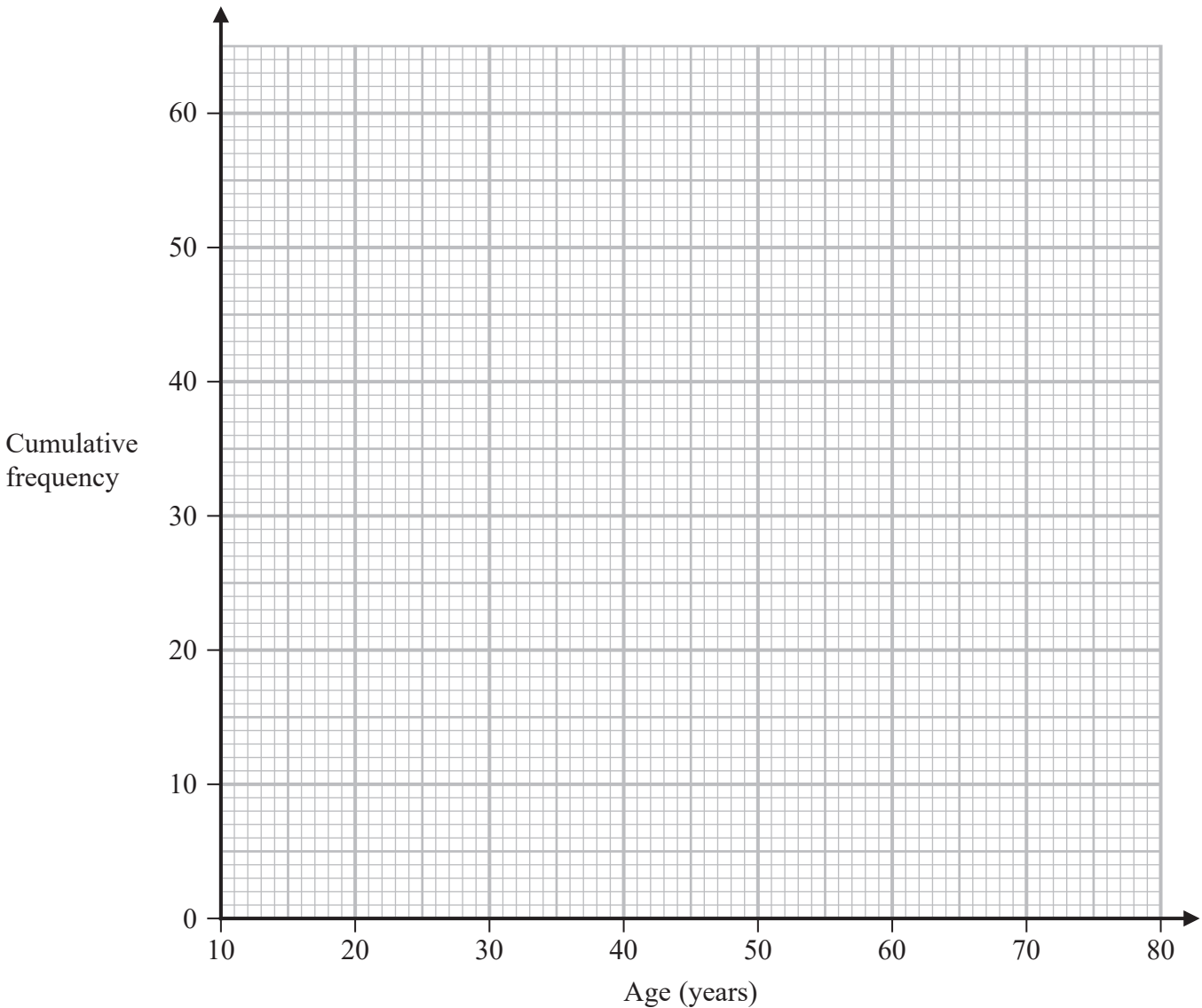
(Total for Question 12 is 7 marks)



11 The cumulative frequency table shows information about the ages of 60 people who went to a gym on Saturday.

Age (a years)	Cumulative frequency
$10 < a \leq 20$	13
$10 < a \leq 30$	36
$10 < a \leq 40$	42
$10 < a \leq 50$	47
$10 < a \leq 60$	52
$10 < a \leq 70$	56
$10 < a \leq 80$	60

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



(2)



Question 11 continued

(b) Use your graph to find an estimate for the median of the ages of these people.

..... years
(1)

(c) Use your graph to find an estimate for the interquartile range of the ages of these people.

..... years
(2)

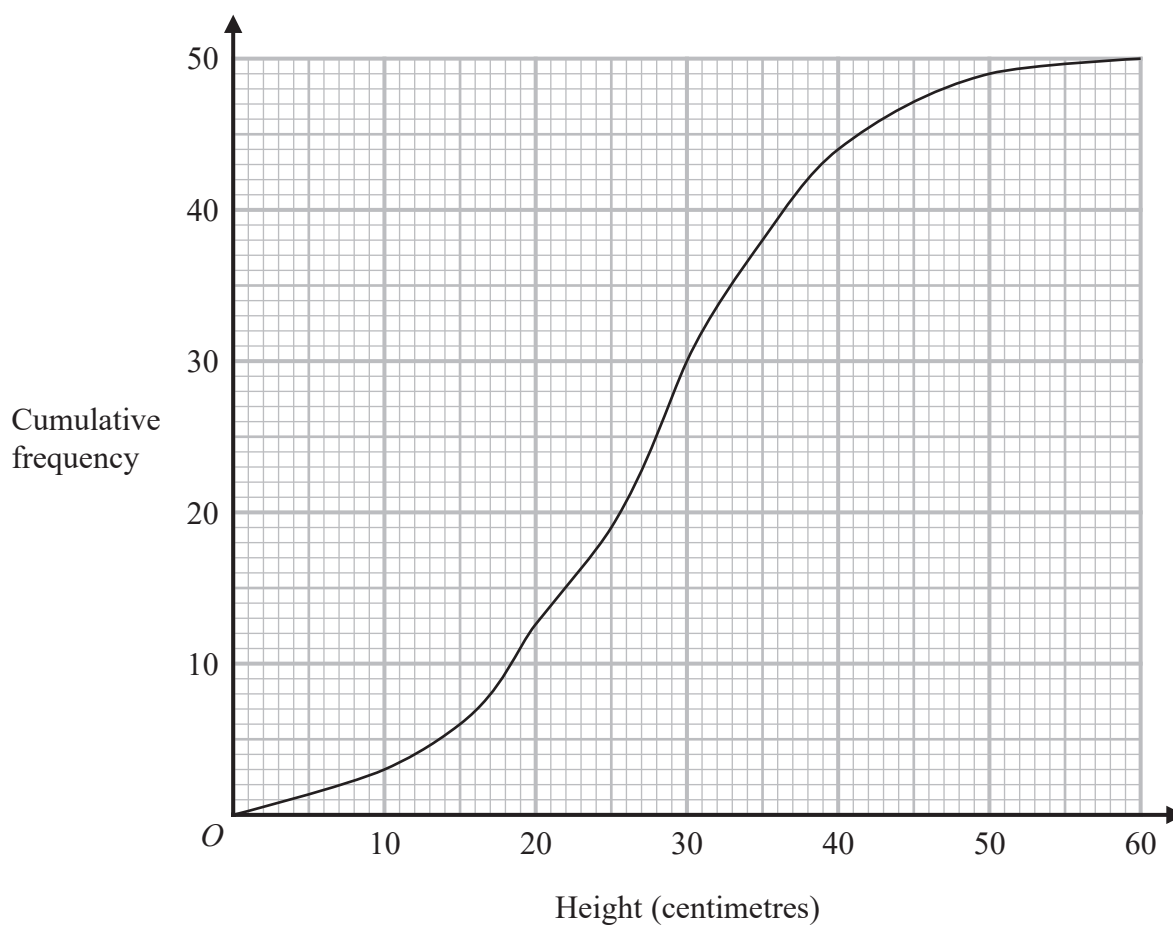
(d) Use your graph to find an estimate for the number of these people who are older than 55 years.

.....
(2)

(Total for Question 11 is 7 marks)



- 12 The cumulative frequency graph shows information about the heights, in centimetres, of 50 plants in a flowerbed.



- (a) Use the graph to find an estimate for the median height of these plants.

..... centimetres
(1)

- (b) Use the graph to find the frequency for the class interval $30 < \text{Height} \leq 40$

.....
(1)

- (c) Use the graph to find an estimate for the number of plants with a height greater than 35 centimetres.

.....
(2)

(Total for Question 12 is 4 marks)



13 A is the point with coordinates $(-5, 12)$

B is the point with coordinates $(19, -48)$

Find an equation of the straight line that passes through the points A and B

(Total for Question 13 is 3 marks)



14 The table gives information about the times taken by 80 people to run a race.

Time taken (t minutes)	Frequency
$50 < t \leq 60$	15
$60 < t \leq 70$	16
$70 < t \leq 80$	21
$80 < t \leq 90$	14
$90 < t \leq 100$	8
$100 < t \leq 110$	6

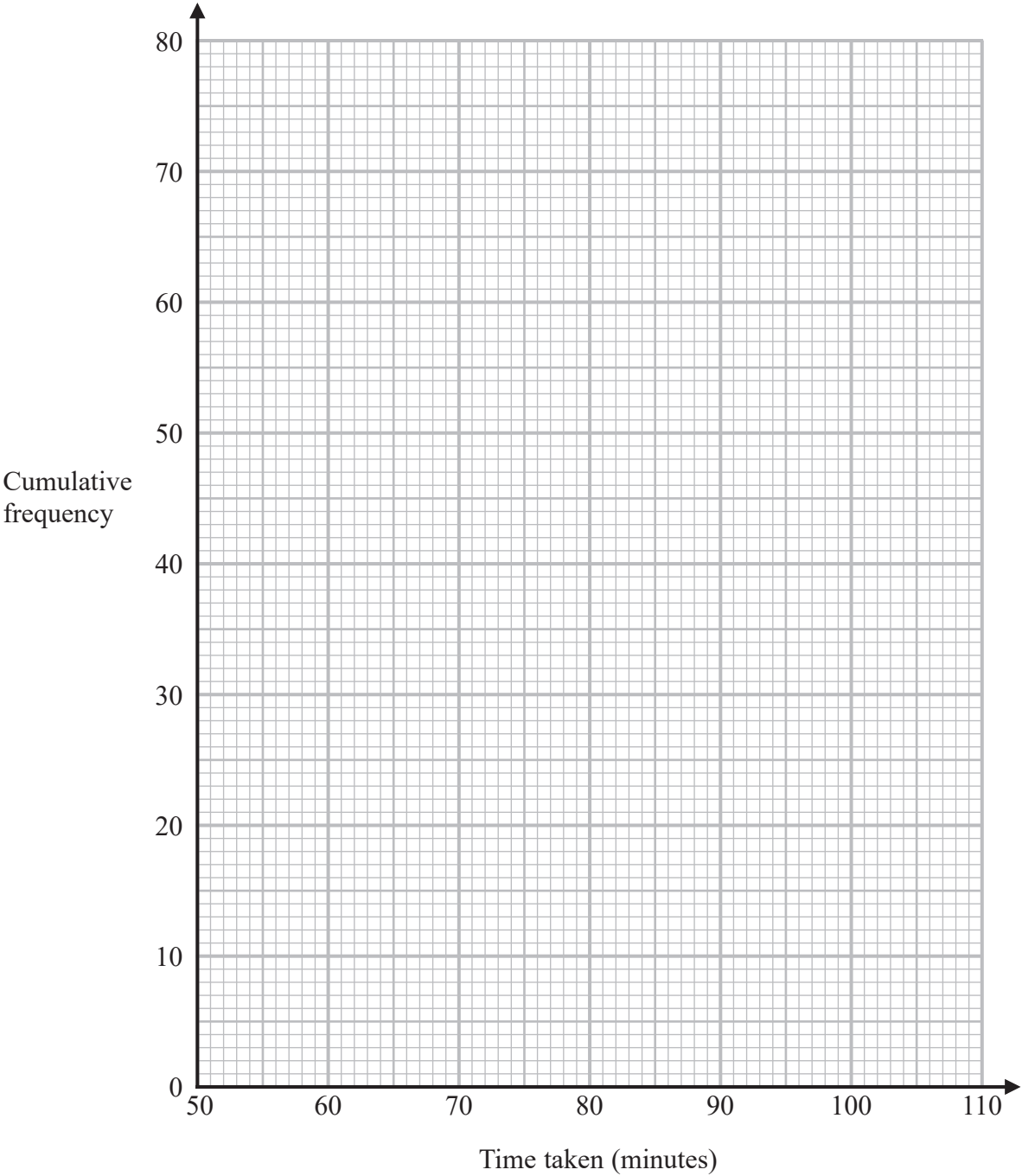
(a) Complete the cumulative frequency table.

Time taken (t minutes)	Cumulative frequency
$50 < t \leq 60$	
$50 < t \leq 70$	
$50 < t \leq 80$	
$50 < t \leq 90$	
$50 < t \leq 100$	
$50 < t \leq 110$	

(1)



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



(2)

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

..... minutes
(1)

(d) Use your graph to find an estimate for the interquartile range of the times taken.

..... minutes
(2)

(Total for Question 14 is 6 marks)



13 The table gives information about the distances, in km, that 70 teachers travel to school.

Distance (d km)	Frequency
$0 < d \leq 10$	7
$10 < d \leq 20$	17
$20 < d \leq 30$	18
$30 < d \leq 40$	14
$40 < d \leq 50$	10
$50 < d \leq 60$	4

(a) Complete the cumulative frequency table.

Distance (d km)	Cumulative frequency
$0 < d \leq 10$	
$0 < d \leq 20$	
$0 < d \leq 30$	
$0 < d \leq 40$	
$0 < d \leq 50$	
$0 < d \leq 60$	

(1)

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

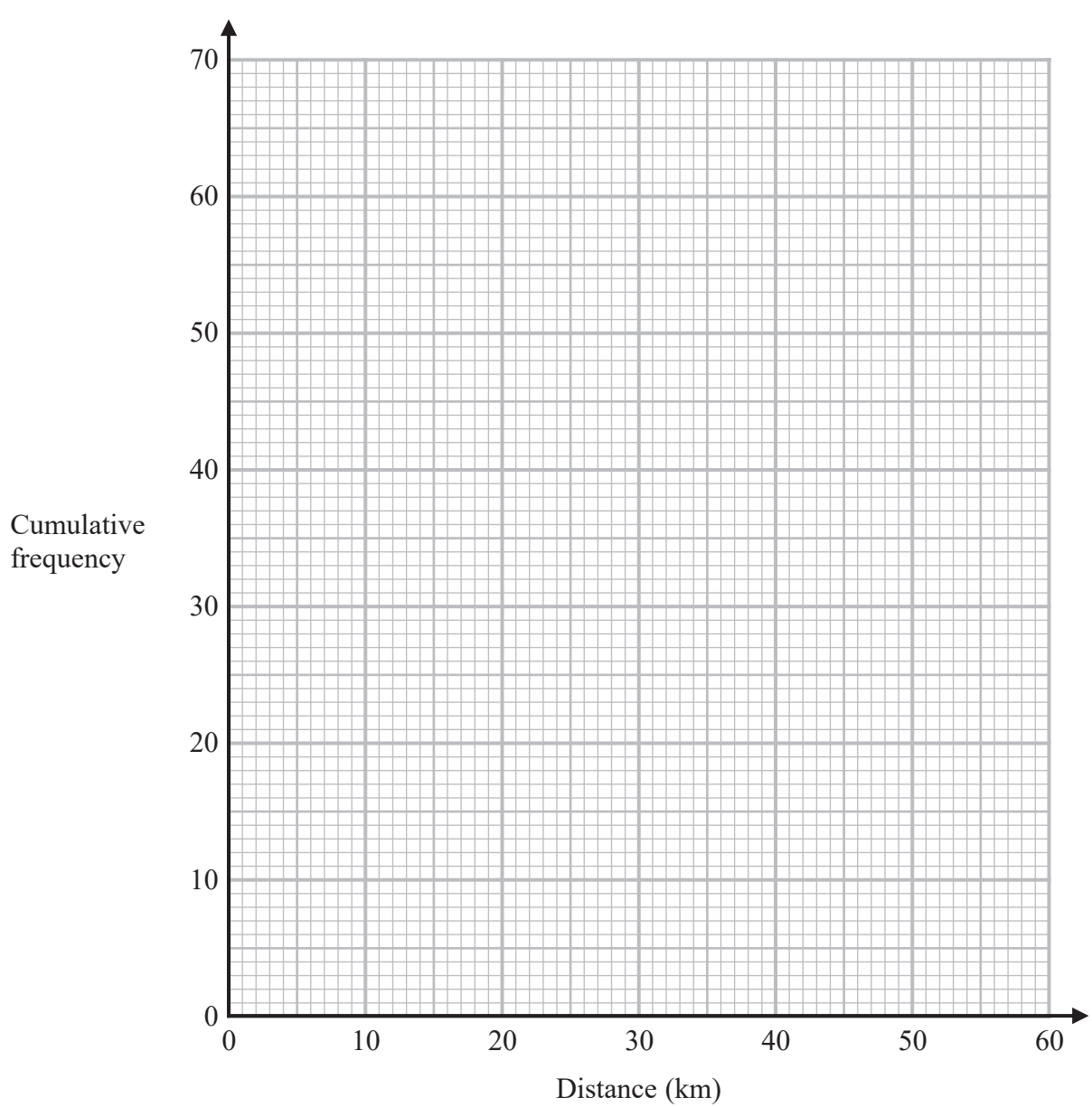
(2)



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

..... km
(2)

(d) Use your graph to find an estimate for the number of teachers who travel more than 46 km.

.....
(2)

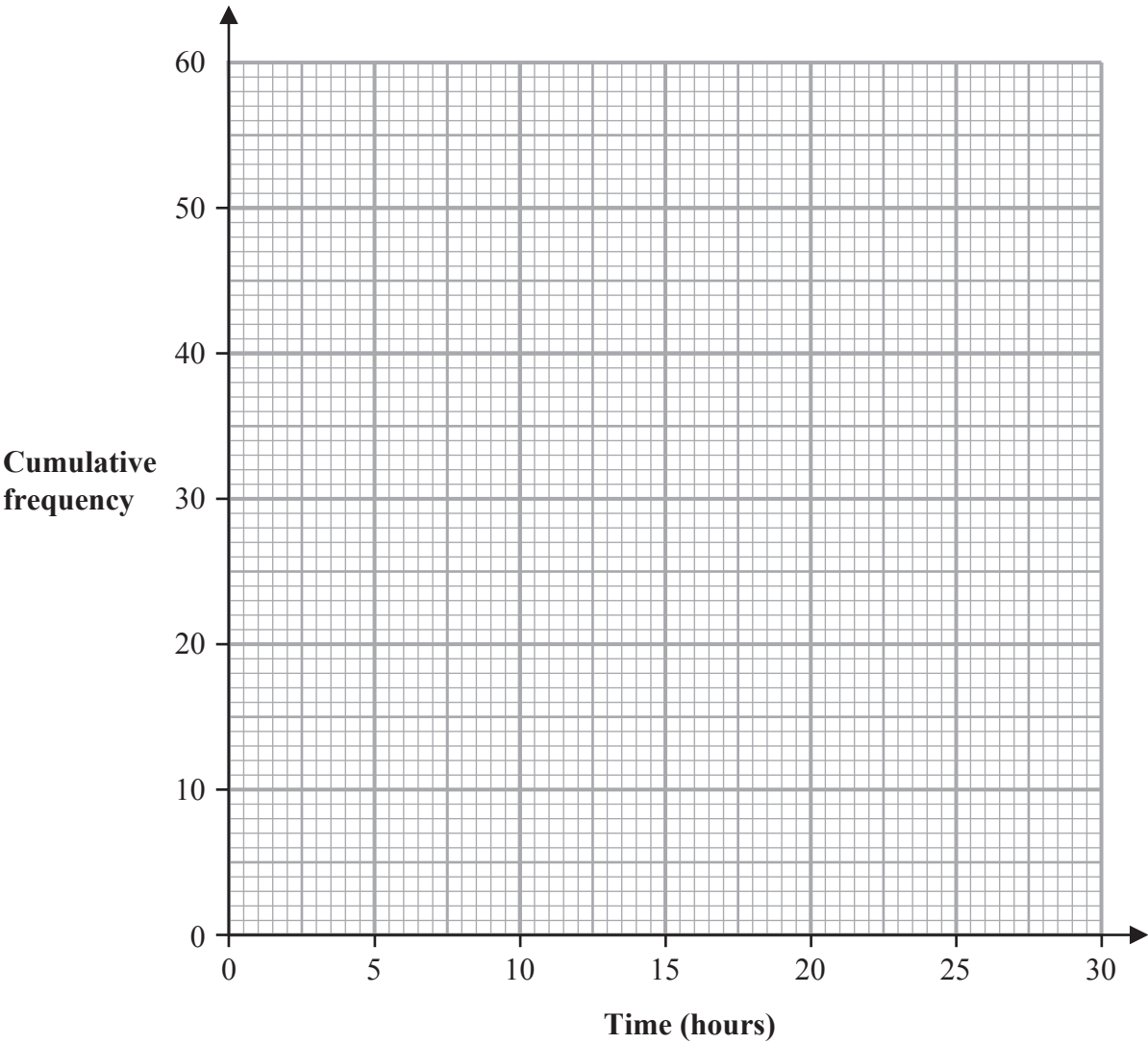
(Total for Question 13 is 7 marks)



11 The cumulative frequency table gives information about the time, in hours, that each of 60 workers spent working from home in one week.

Time (t hours)	Cumulative frequency
$0 < t \leq 5$	6
$0 < t \leq 10$	17
$0 < t \leq 15$	27
$0 < t \leq 20$	42
$0 < t \leq 25$	53
$0 < t \leq 30$	60

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



(2)



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

..... hours
(2)

25 workers spent more than W hours working from home.

(c) Use your graph to find an estimate for the value of W

$W =$
(2)

One of the 60 workers is chosen at random.
This worker spent H hours working from home.

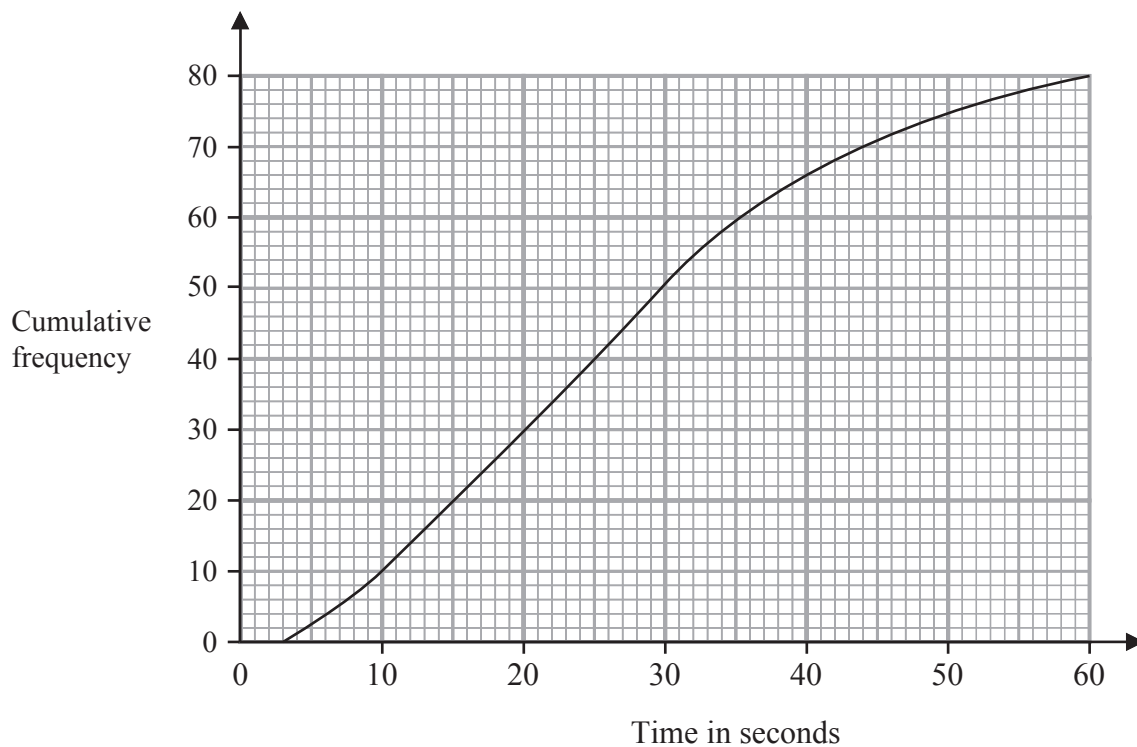
(d) Find the probability that $5 < H \leq 10$

.....
(1)

(Total for Question 11 is 7 marks)



- 13 The cumulative frequency graph gives information about the times, in seconds, that 80 adults took to log in to an online bank.



- (a) Find an estimate for the median time.

..... seconds
(1)

- (b) Work out the percentage of these adults that took longer than 50 seconds to log in.
Show your working clearly.

..... %
(3)

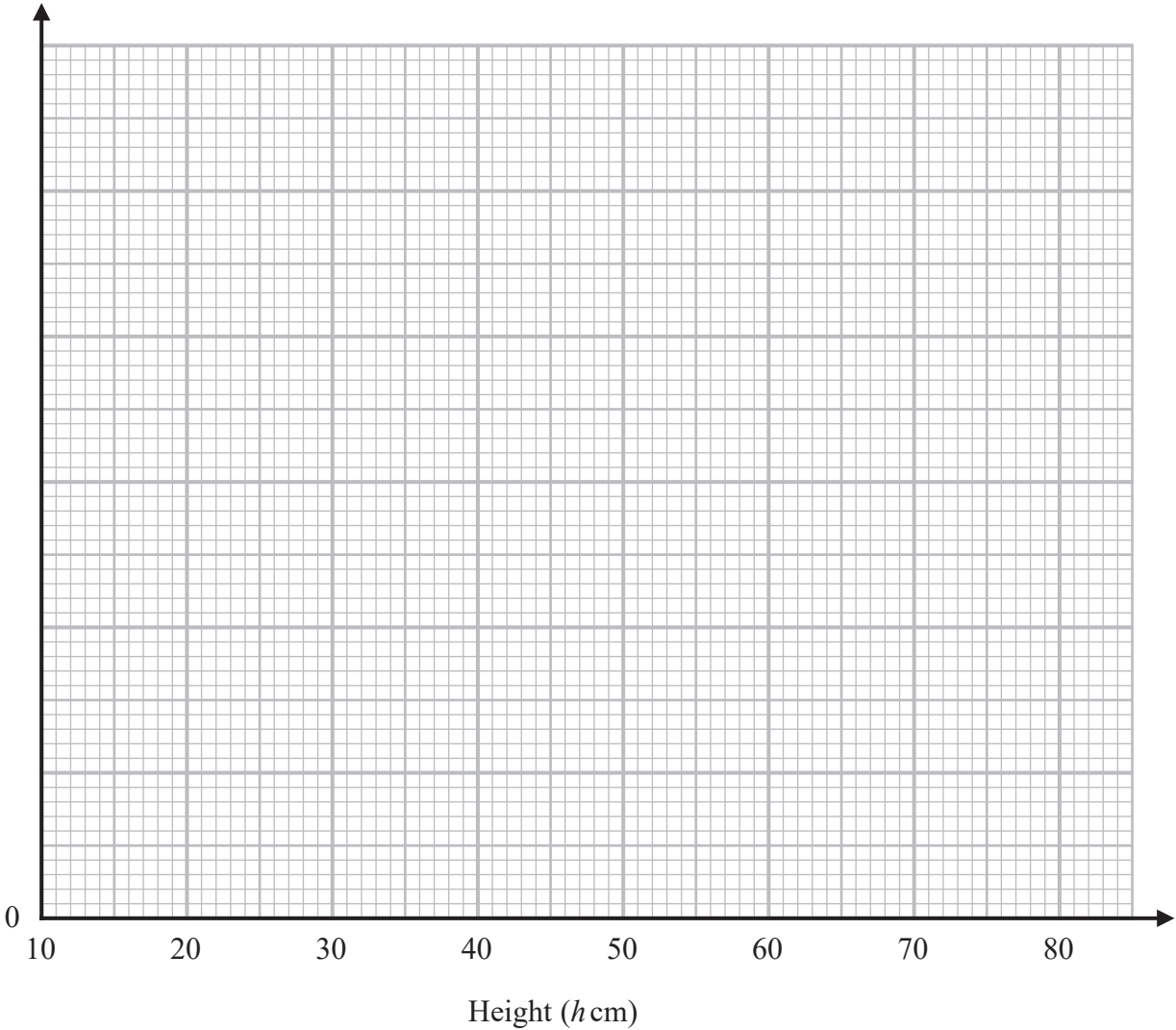
(Total for Question 13 is 4 marks)



18 The table gives information about the heights, in centimetres, of some plants.

Height (h cm)	Frequency
$10 < h \leq 20$	35
$20 < h \leq 35$	45
$35 < h \leq 50$	75
$50 < h \leq 70$	40
$70 < h \leq 80$	8

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



(3)

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(b) Work out an estimate for the number of these plants with a height greater than 40 cm.

.....
(2)

(Total for Question 18 is 5 marks)

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