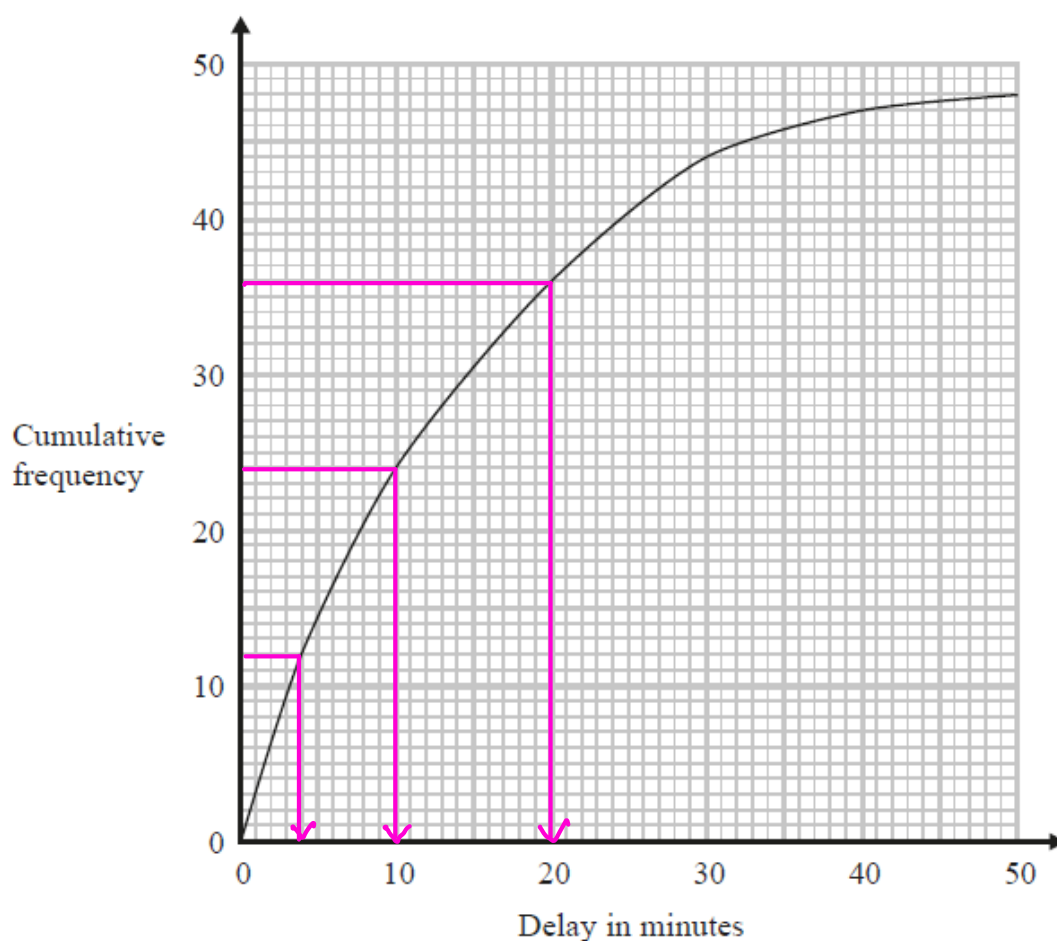# Questions

Q1.

The times that 48 trains left a station on Monday were recorded.

The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.
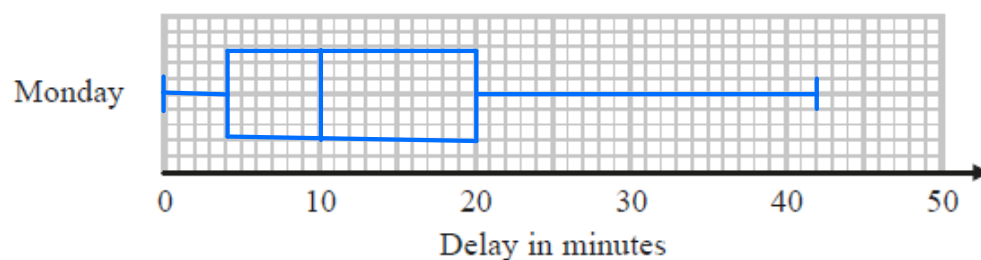

The shortest delay was 0 minutes.
The longest delay was 42 minutes.

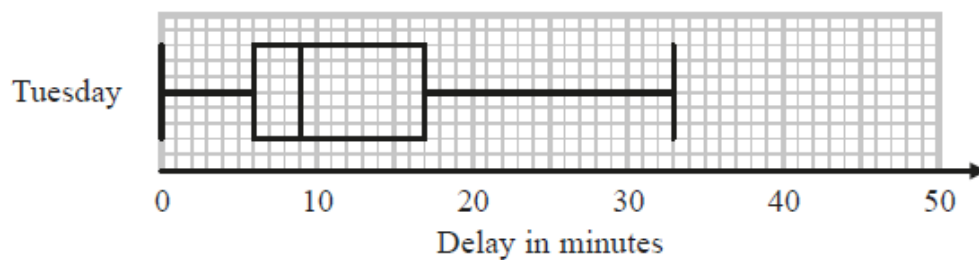$Q_1 = 4$ $Q_2 = 10$ $Q_3 = 20$

(a) On the grid below, draw a box plot for the information about the delays on Monday.

(3)

48 trains left the station on Tuesday.
The box plot below gives information about the delays on Tuesday.

Tuesday

Delay in minutes

(b) Compare the distribution of the delays on Monday with the distribution of the delays on Tuesday.

On average Monday trains were delayed slightly longer than Tuesday trains. They had a median delay of 10 min compared to 9 min.
The delays on Mon were more varied than Tue.
IQR for Mon was 16 min compared to 11 min on Tue. (2)

Mary says,

"The longest delay on Tuesday was 33 minutes.
This means that there must be some delays of between 25 minutes and 30 minutes."

(c) Is Mary right?

You must give a reason for your answer.
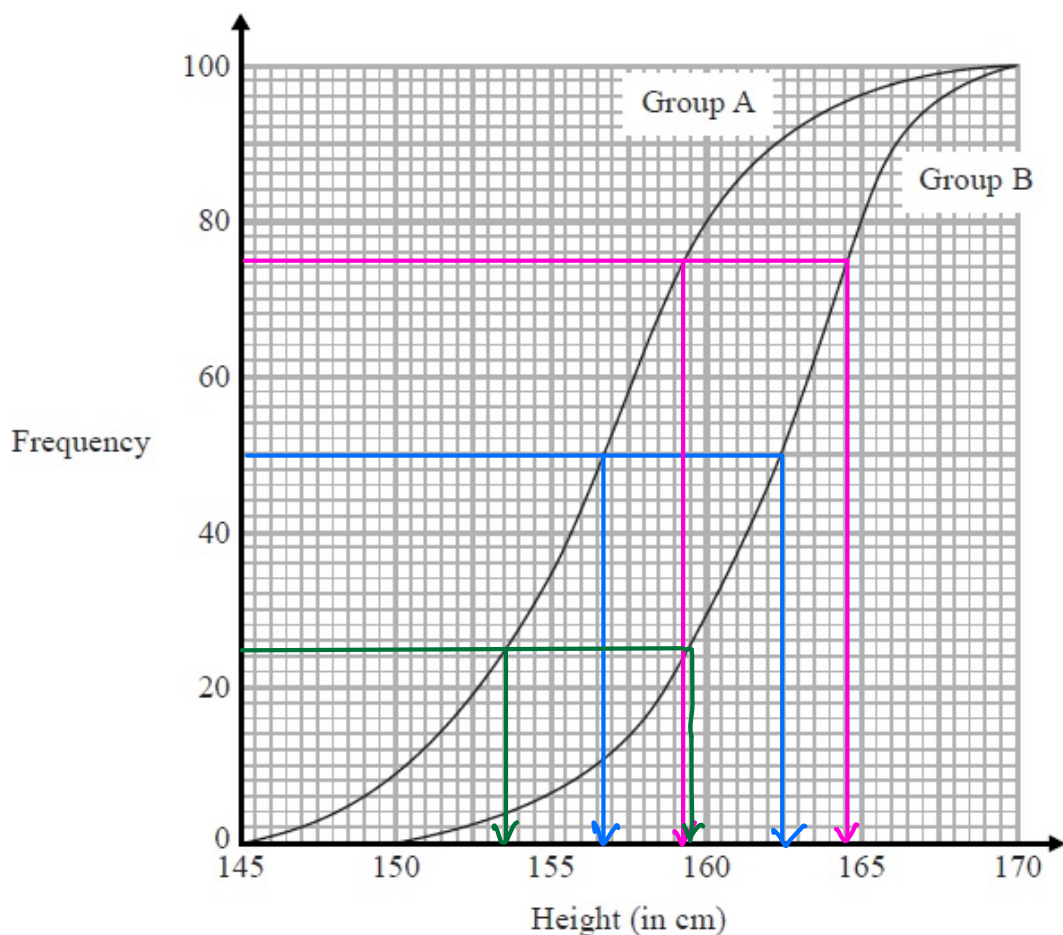
Not necessarily. Top 25% of delays could all be between 17 - 24 min and 31 - 33 min

(1)

(Total for question = 6 marks)

Q2.

The cumulative frequency graphs give information about the heights of two groups of children, group A and group B.

Group A
Qc 153.5cm
Median 156.5cm
Q3   159 cm
  IQR 5.5cm

Group B

Q1 159.5cm
Median 162.5cm
Q3 164.5cm
  IQR 5cm

Compare the heights of the children in group A and the heights of the children in group B.

On average children in group B were taller than those in group A. Group B had a median height 6cm more than Group A.

The variation of heights was similar in both groups with the IQRs within 0.5cm of each other.

(Total for Question is 2 marks)

Q3.

Lyndsey records the number of miles (m) she drives each day for 120 days.

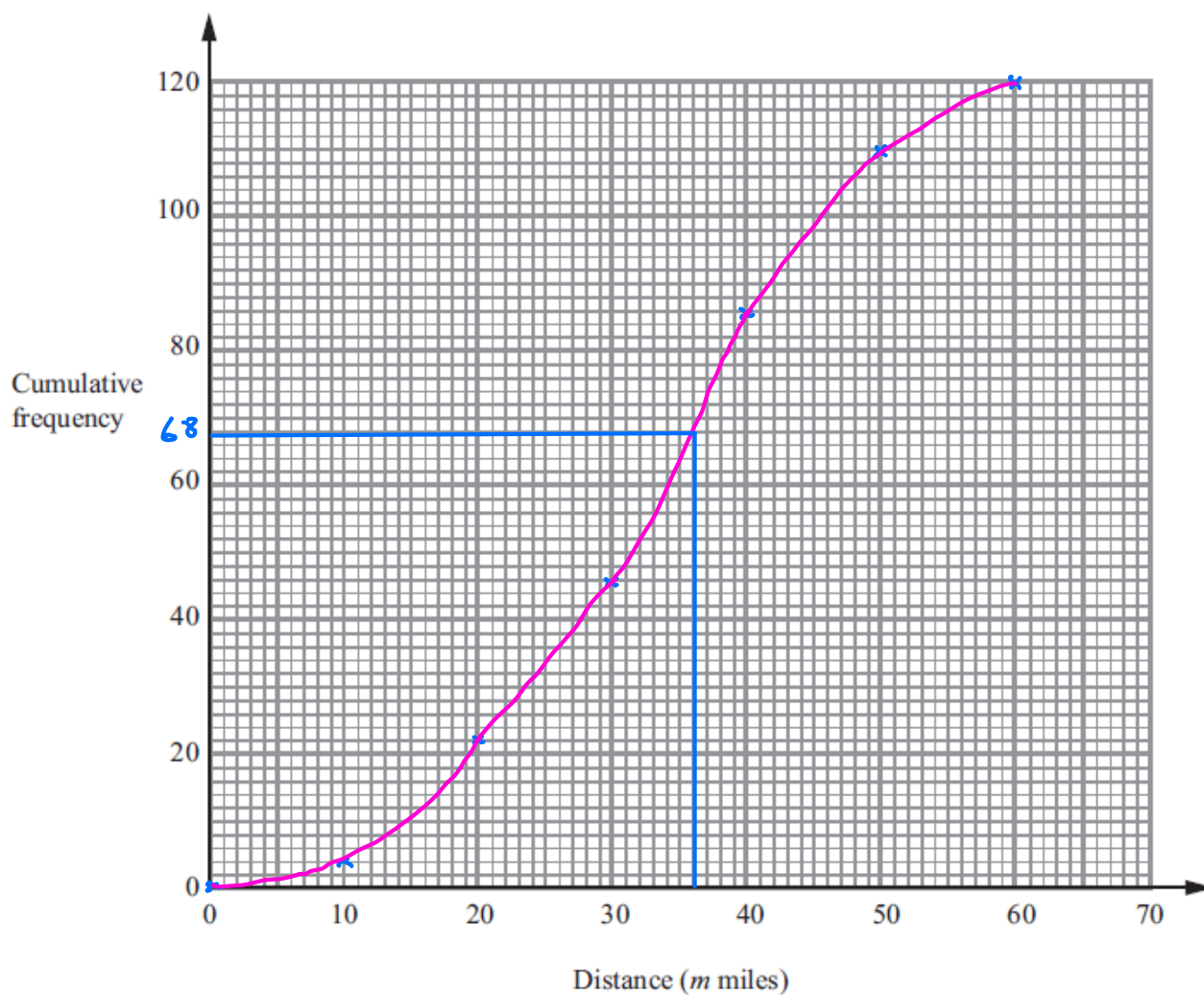Some information about the results is given in the table.

Distance (*m* miles)	Frequency
$0 < m \leqslant 10$	4
$10 < m \leqslant 20$	18
$20 < m \leqslant 30$	24
$30 < m \leqslant 40$	40
$40 < m \leqslant 50$	24
$50 < m \leqslant 60$	10

(a) Complete the cumulative frequency table.

Distance (*m* miles)	Cumulative frequency
$0 < m \leqslant 10$	4
$0 < m \leqslant 20$	22
$0 < m \leqslant 30$	46
$0 < m \leqslant 40$	86
$0 < m \leqslant 50$	110
$0 < m \leqslant 60$	120

(1)

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

(2)

(c)   Work out an estimate for the number of days on which Lyndsey drives more than 36 miles.

$120 - 68 = 52$

....52............................days

(2)

(Total for Question is 5 marks)

Q4.

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

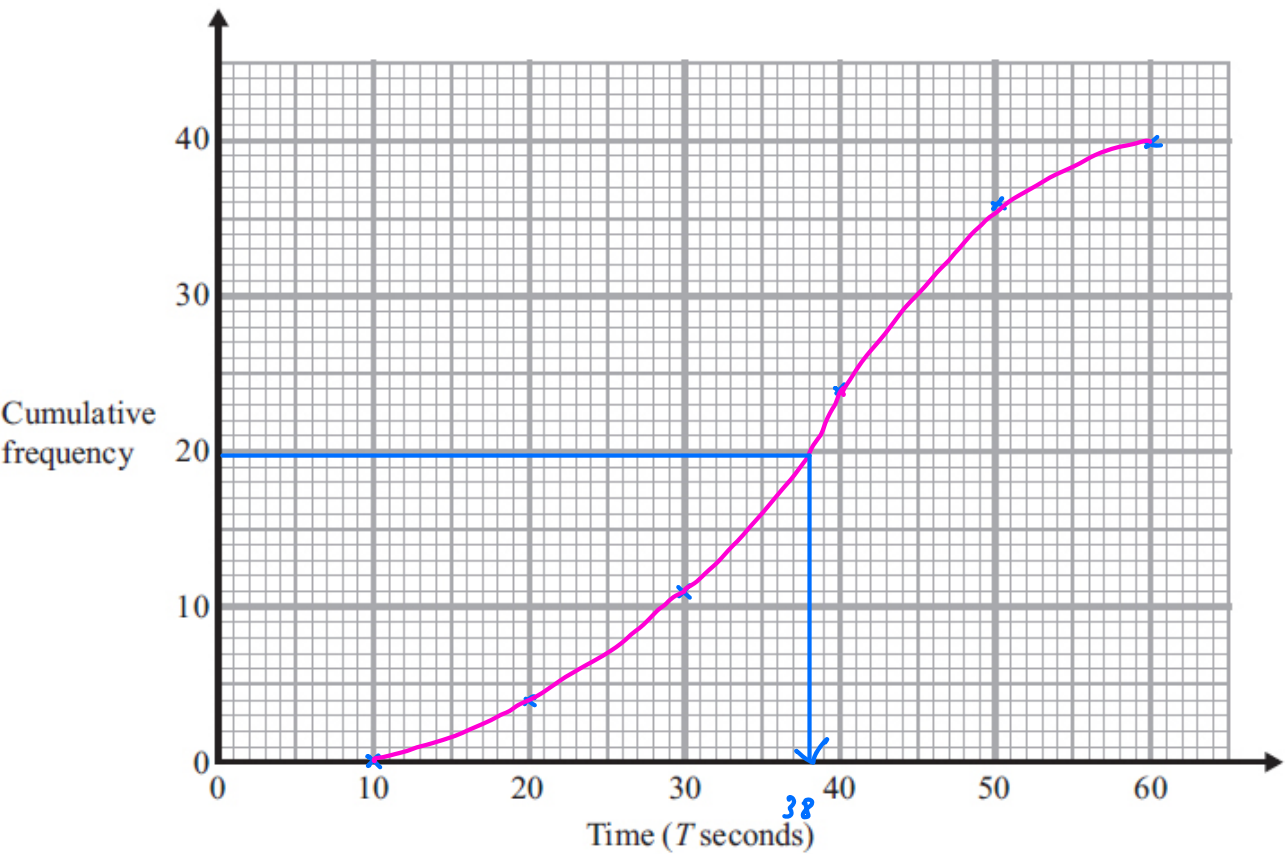| Time (T seconds)	Frequency
$10 < T \leq 20$	4
$20 < T \leq 30$	7
$30 < T \leq 40$	13
$40 < T \leq 50$	12
$50 < T \leq 60$	4

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

Time (*T* seconds)	Cumulative frequency
10 < *T* ≤ 20	4
10 < *T* ≤ 30	11
10 < *T* ≤ 40	24
10 < *T* ≤ 50	36
10 < *T* ≤ 60	40

(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.

. . . . 38 . . . . seconds

(1)

(Total for Question is 4 marks)

Q5.

The table shows information about the heights of 40 plants.

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

(a) Complete the cumulative frequency table.

Height (h cm)	Cumulative frequency
$170 < h \leqslant 175$	5
$170 < h \leqslant 180$	23
$170 < h \leqslant 185$	35
$170 < h \leqslant 190$	39
$170 < h \leqslant 195$	40

(1)

(b) On the grid, draw a cumulative frequency graph for your table.
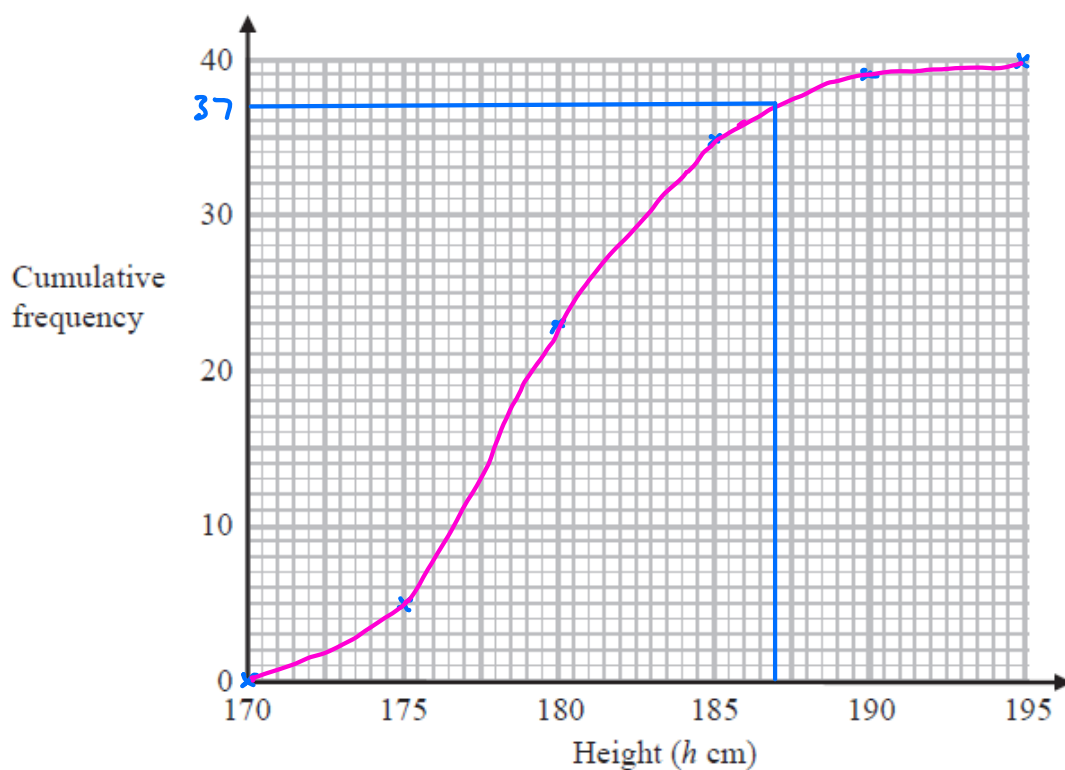
(2)

(c) Find an estimate for the number of plants with a height greater than 187 cm.

$40 - 37$

....3...

(2)

(Total for question = 5 marks)

Q6.

Sue works for a company that delivers parcels.

One day the company delivered 80 parcels.
The table shows information about the weights, in kg, of these parcels.

Weight (w kg)	Frequency
$0 < w \leqslant 1$	19
$1 < w \leqslant 2$	17
$2 < w \leqslant 3$	15
$3 < w \leqslant 4$	12
$4 < w \leqslant 5$	10
$5 < w \leqslant 6$	7

(a) Complete the cumulative frequency table.

Weight (w kg)	Cumulative frequency
$0 < w \leqslant 1$	19
$0 < w \leqslant 2$	36
$0 < w \leqslant 3$	51
$0 < w \leqslant 4$	63
$0 < w \leqslant 5$	73
$0 < w \leqslant 6$	80

(1)

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

(2)
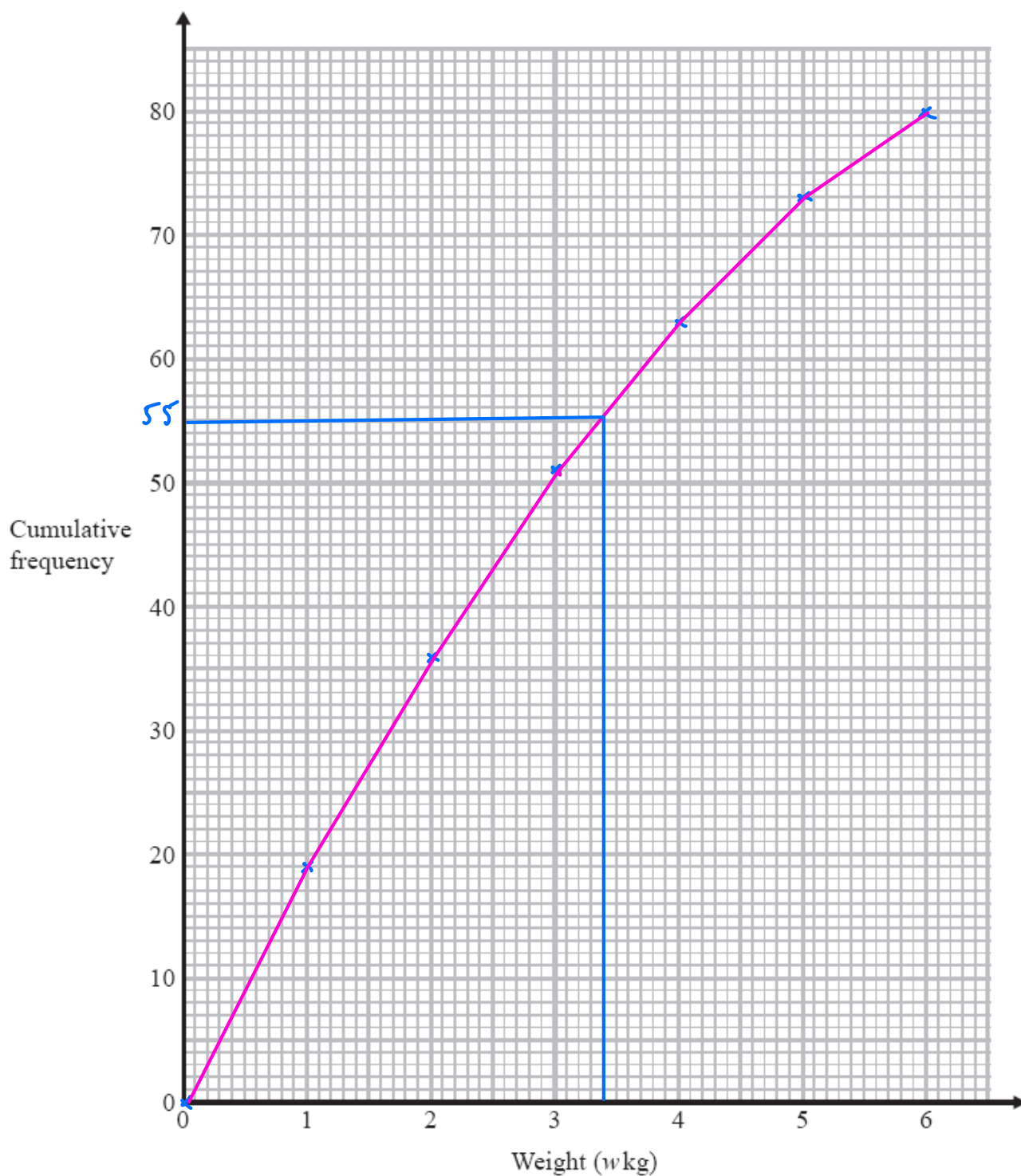
Sue says,

"75 % of the parcels weigh less than 3.4 kg."

*(c) Is Sue correct?

You must show how you get your answer.

$\dfrac{55}{80}$ are less than 3.4 kg

$\dfrac{55}{80} \times 100 = 68.75\%$

Sue is not correct

(3)

(Total for question = 6 marks)

Q7.

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
$20 < t \leqslant 30$	4
$20 < t \leqslant 40$	20
$20 < t \leqslant 50$	56
$20 < t \leqslant 60$	80
$20 < t \leqslant 70$	94
$20 < t \leqslant 80$	100

(1)

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

(2)
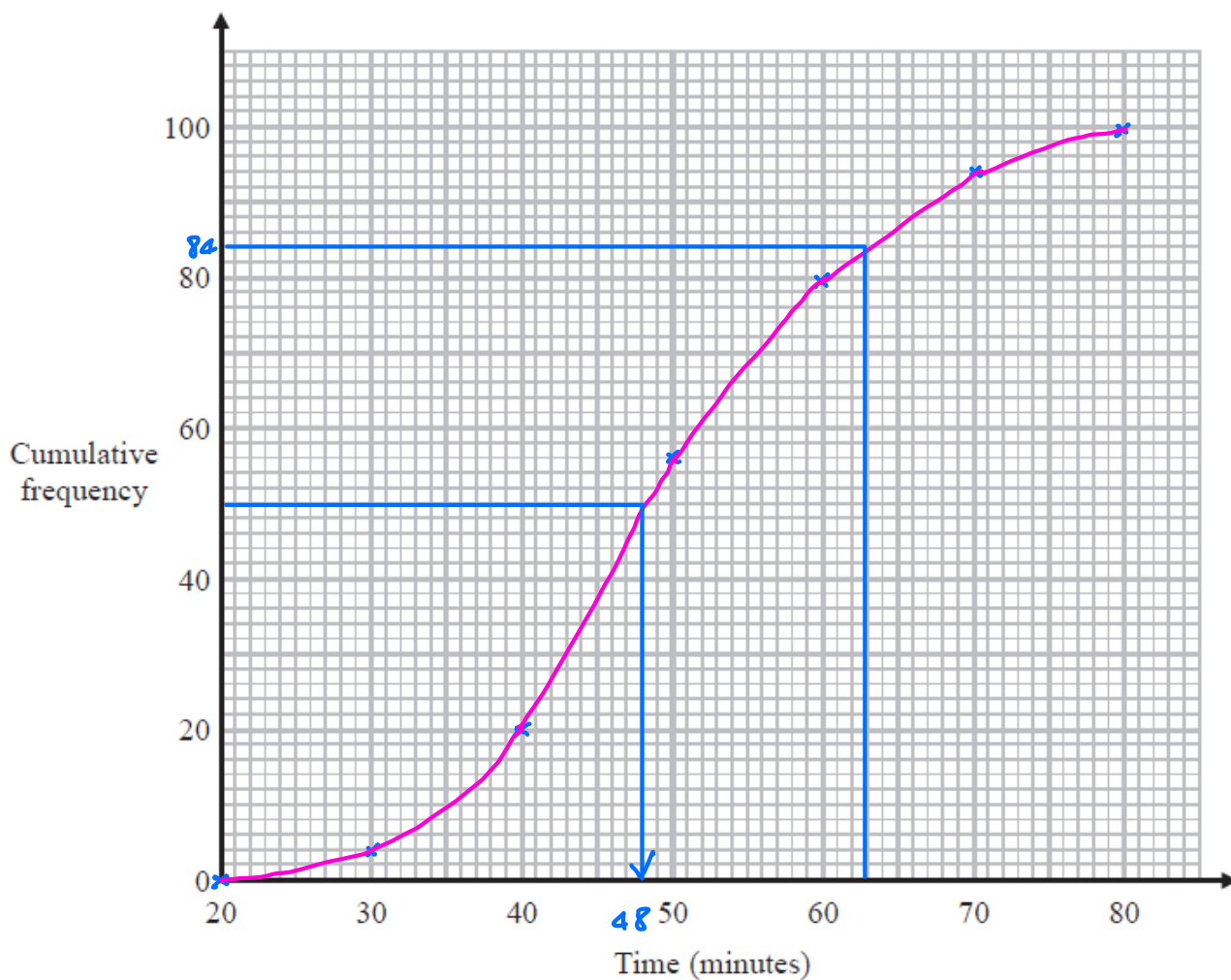
(c) Use your graph to find an estimate for the median time.

48

.... minutes

(1)

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

$100 - 84 = 16$

16

....

(2)

(Total for question = 6 marks)

Q8.

The grouped frequency table shows information about the weekly wages of 80 factory workers.

Weekly wage (£x)	Frequency
$100 < x \leq 200$	8
$200 < x \leq 300$	15
$300 < x \leq 400$	30

Weekly wage (£x)	Frequency
400 < x ≤ 500	17
500 < x ≤ 600	7
600 < x ≤ 700	3

(a) Complete the cumulative frequency table.

Weekly wage (£x)	Cumulative Frequency
100 < x ≤ 200	8
200 < x ≤ 300	23
300 < x ≤ 400	53
400 < x ≤ 500	70
500 < x ≤ 600	77
600 < x ≤ 700	80

(1)

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

(2)

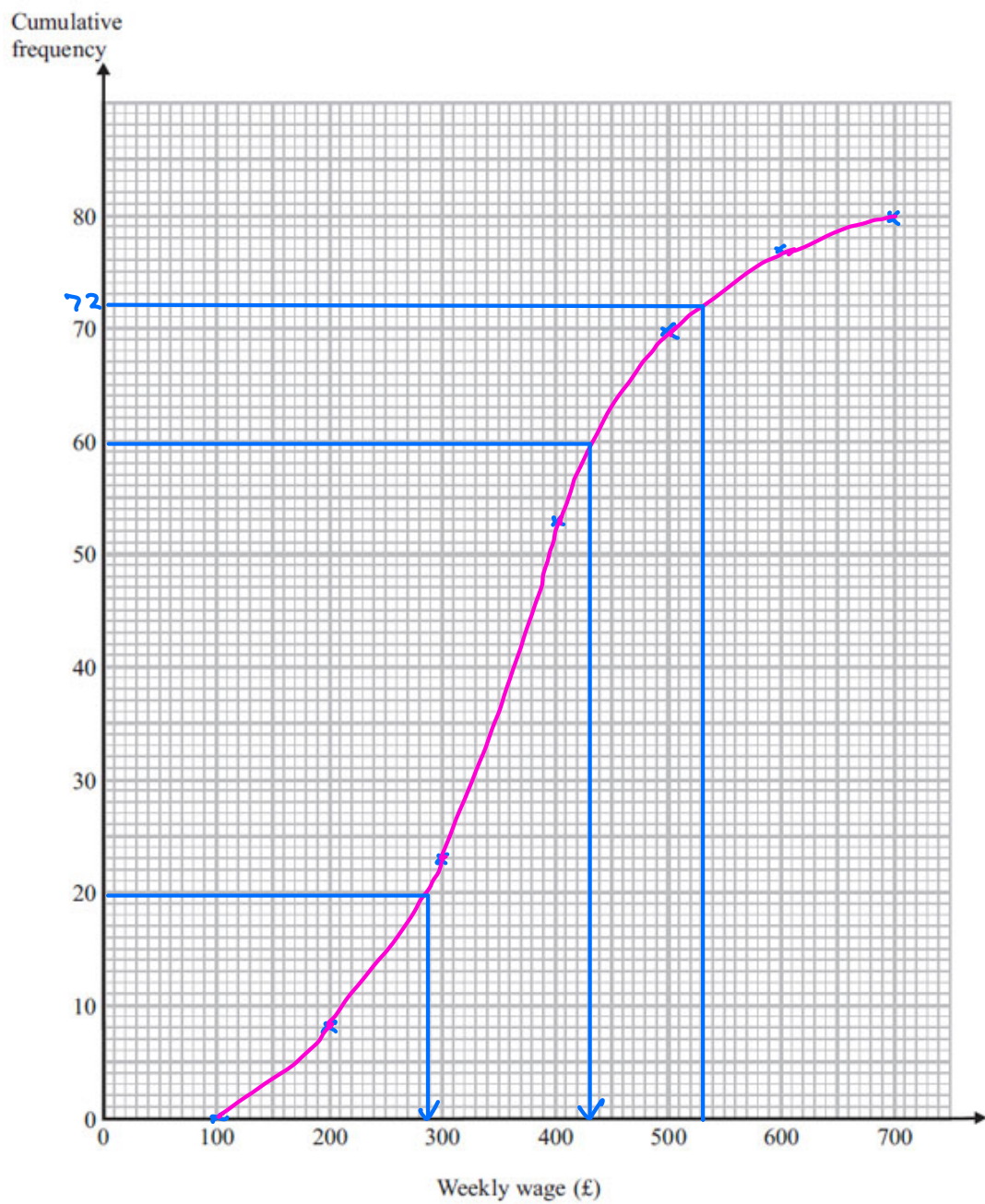(c) Use your graph to find an estimate for the interquartile range.

£.......140..............

(2)

(d) Use your graph to find an estimate for the number of workers with a weekly wage of more than £530

80 − 72 = 8

.........8............

(2)

Cumulative frequency graph of Weekly wage (£)

IQR

$= 430 - 290$

$= £140$

(Total for Question is 7 marks)