

STATISTICAL MEASURES 2- IGCSE MATHEMATICS

NAME Wlorked Solutions

Question 1

The grouped frequency table gives information about the time, in minutes, taken by 50 people to solve a puzzle.

Time (t minutes)	Frequency
$0 < t \leq 10$	5
$10 < t \leq 20$	8
$20 < t \leq 30$	12
$30 < t \leq 40$	15
$40 < t \leq 50$	7
$50 < t \leq 60$	3

Brian was asked to draw a cumulative frequency table for this information

This is the table that Brian drew.

Time (t minutes)	Cumulative frequency
$0 < t \leq 10$	5
$10 < t \leq 20$	13
$20 < t \leq 30$	25
$30 < t \leq 40$	40
$40 < t \leq 50$	47
$50 < t \leq 60$	50

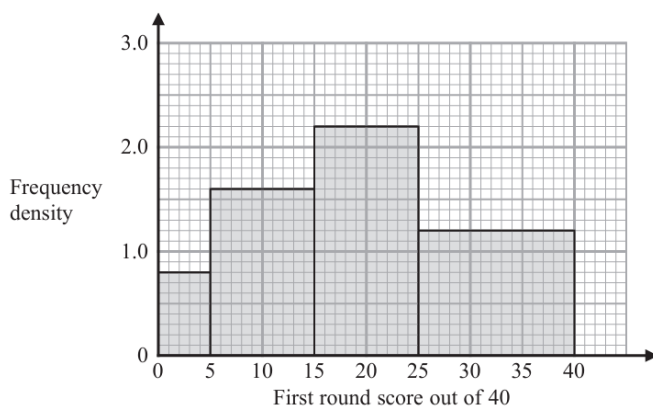
Write down **one** thing that is wrong with this cumulative frequency table.

For cumulative frequency, all time intervals should start at 0 **[1]**

Question 2

Some people took part in the first round of a competition.

The histogram gives information about the scores of these people in the first round.



20% of the people got a score high enough for them to qualify for the second round.

Work out an estimate for the score needed to qualify for the second round.
You must show all your working.

Frequencies

$$5 \times 0.8 = 4$$

$$10 \times 1.6 = 16$$

$$10 \times 2.2 = 22$$

$$15 \times 1.2 = 18$$

$$\underline{60}$$

20% $\times$ 60 = 12 people ✓
From 25-40 each 5 interval has 6 people ✓
So top 20% = 30 marks **[4]** ✓

Question 3

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

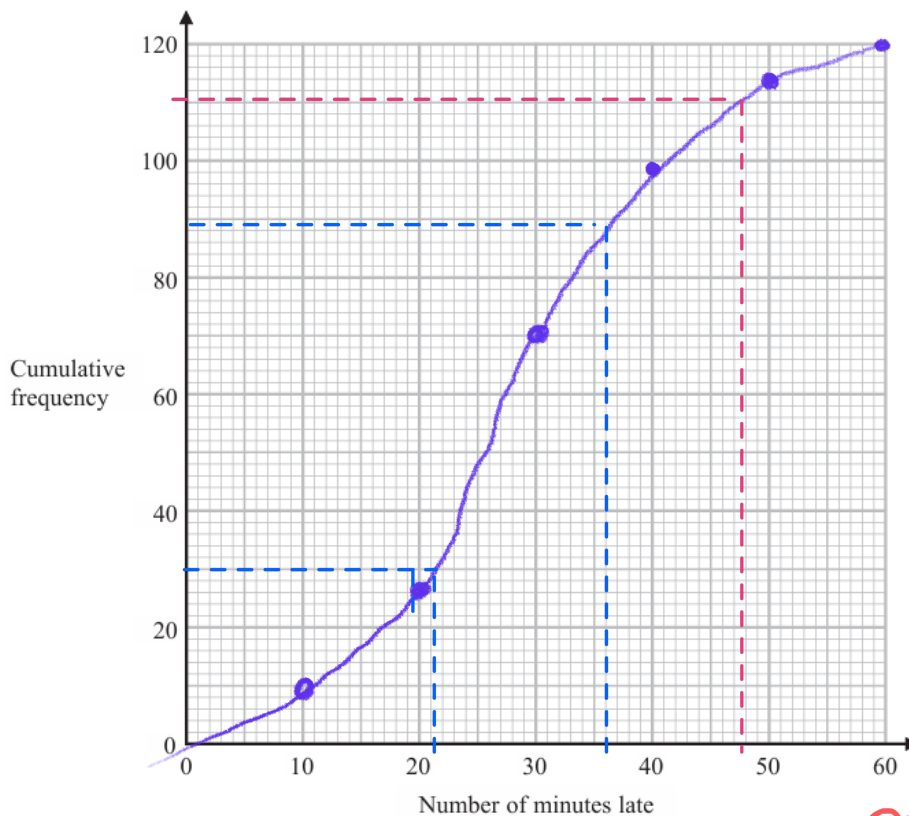
(a) Complete the cumulative frequency table below.

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

Number of minutes late (L)	Cumulative frequency
$0 < L \leq 10$	10
$0 < L \leq 20$	26
$0 < L \leq 30$	70
$0 < L \leq 40$	99
$0 < L \leq 50$	114
$0 < L \leq 60$	120

[1]

(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.

$$IQR = Q_3 - Q_1 \\ = 36 - 21$$

15 minutes

(2)

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

$$120 - 110$$

10 buses

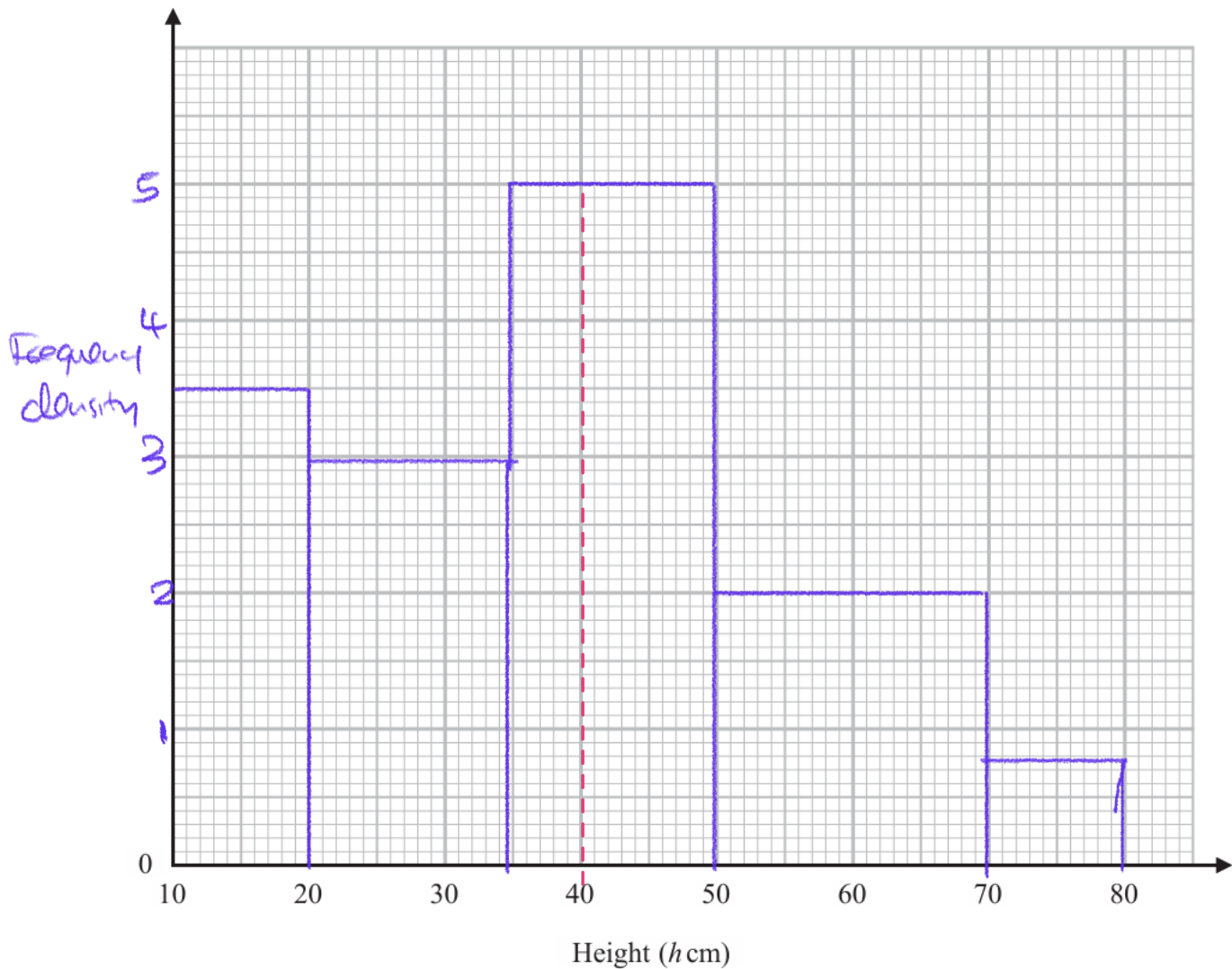
(2)

Question 4

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

Height (h cm)	Frequency	FD
$10 < h \leq 20$	35	3.5
$20 < h \leq 35$	45	3
$35 < h \leq 50$	75	5
$50 < h \leq 70$	40	2
$70 < h \leq 80$	8	0.8

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



(3)

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

$$\begin{aligned}
 & (10 \times 5) + (20 \times 2) + (10 \times 0.8) \\
 & = 50 + 40 + 8 = \underline{\underline{98}}
 \end{aligned}$$

[2]

Question 5

The table shows information about the lengths of time, in minutes, 120 customers spent in a supermarket.

Length of time (L minutes)	Frequency
$20 < L \leq 30$ 25	6
$30 < L \leq 40$ 35	26
$40 < L \leq 50$ 45	31
$50 < L \leq 60$ 55	40
$60 < L \leq 70$ 65 ✓	17 ✓

$$\begin{array}{r}
 150 \\
 910 \\
 1395 \\
 2200 \\
 1105 \\
 \hline
 5760
 \end{array}$$

(a) Write down the modal class.

$$50 < L \leq 60$$

(1)

(b) Work out an estimate for the mean length of time spent by the 120 customers in the supermarket.

$$\text{Mean} = 5760 \div 120$$

=

48

minutes

(4)

Question 6

The table shows information about the heights, in cm, of 48 sunflowers in a garden centre.

Height of sunflower (h cm)	Frequency
$90 < h \leq 100$ 95	8
$100 < h \leq 110$ 105	12
$110 < h \leq 120$ 115	15
$120 < h \leq 130$ 125	10
$130 < h \leq 140$ 135 ✓	3 ✓

760

1260

1725

1250

405

5400

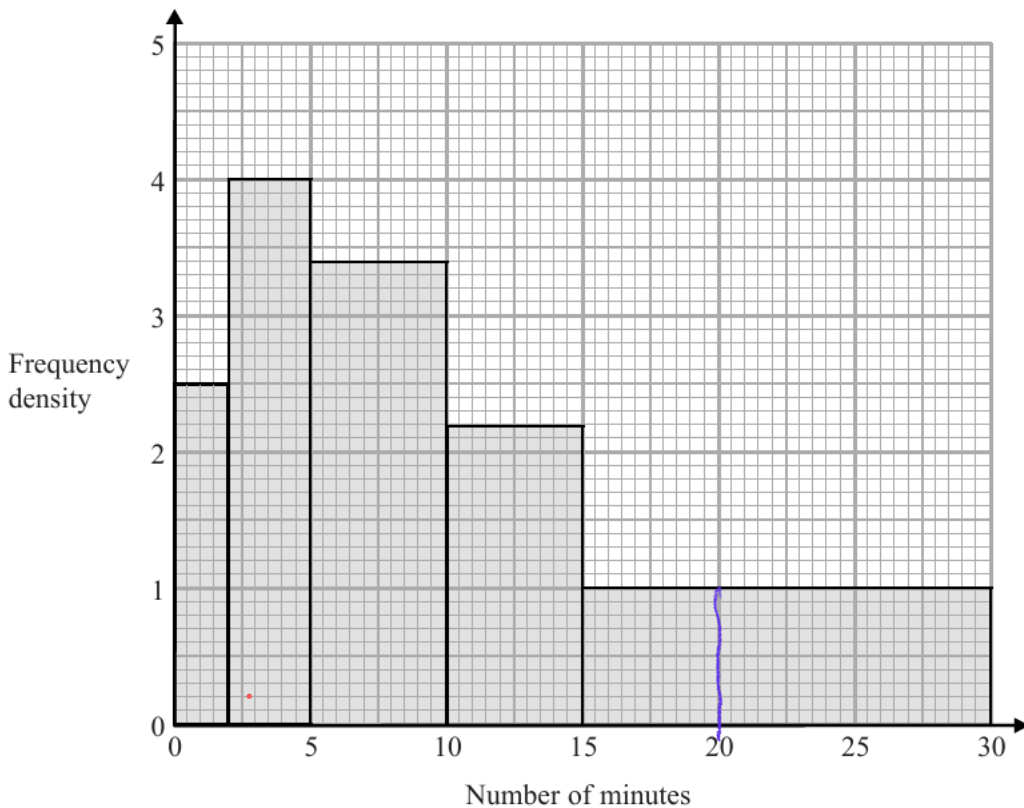
Work out an estimate for the mean height of the sunflowers.

$$\begin{aligned}
 \text{Mean} &= 5400 \div 48 \\
 &= 112.5
 \end{aligned}$$

[4]

Question 7

The histogram shows information about the numbers of minutes some people waited to be served at a Post Office.



$$\begin{aligned}
 2 \times 2.5 &= 5 \\
 3 \times 4 &= 12 \\
 5 \times 3.4 &= 17 \\
 5 \times 2.2 &= 11 \\
 15 \times 1 &= 15 \\
 \hline
 &60 \quad \checkmark
 \end{aligned}$$

Work out an estimate for the proportion of these people who waited longer than 20 minutes to be served.

$$\begin{aligned}
 \text{longer than 20 mins} &= 10 \times 1 = 10 \quad \checkmark \\
 \text{Proportion} &= \frac{10}{60}
 \end{aligned}$$

$$\frac{1}{6} \quad \checkmark$$

[3]

Question 8

The frequency table gives information about the numbers of mice in some nests.

Number of mice	Frequency
5	4
6	13
7	16
8	x
9	6

$$\frac{(5 \times 4) + (6 \times 13) + (7 \times 16) + 8x + (9 \times 6)}{x + 39} = 7 \quad \checkmark$$

$$\frac{20 + 78 + 112 + 54 + 8x}{x + 39} = 7 \quad \checkmark$$

The mean number of mice in a nest is 7

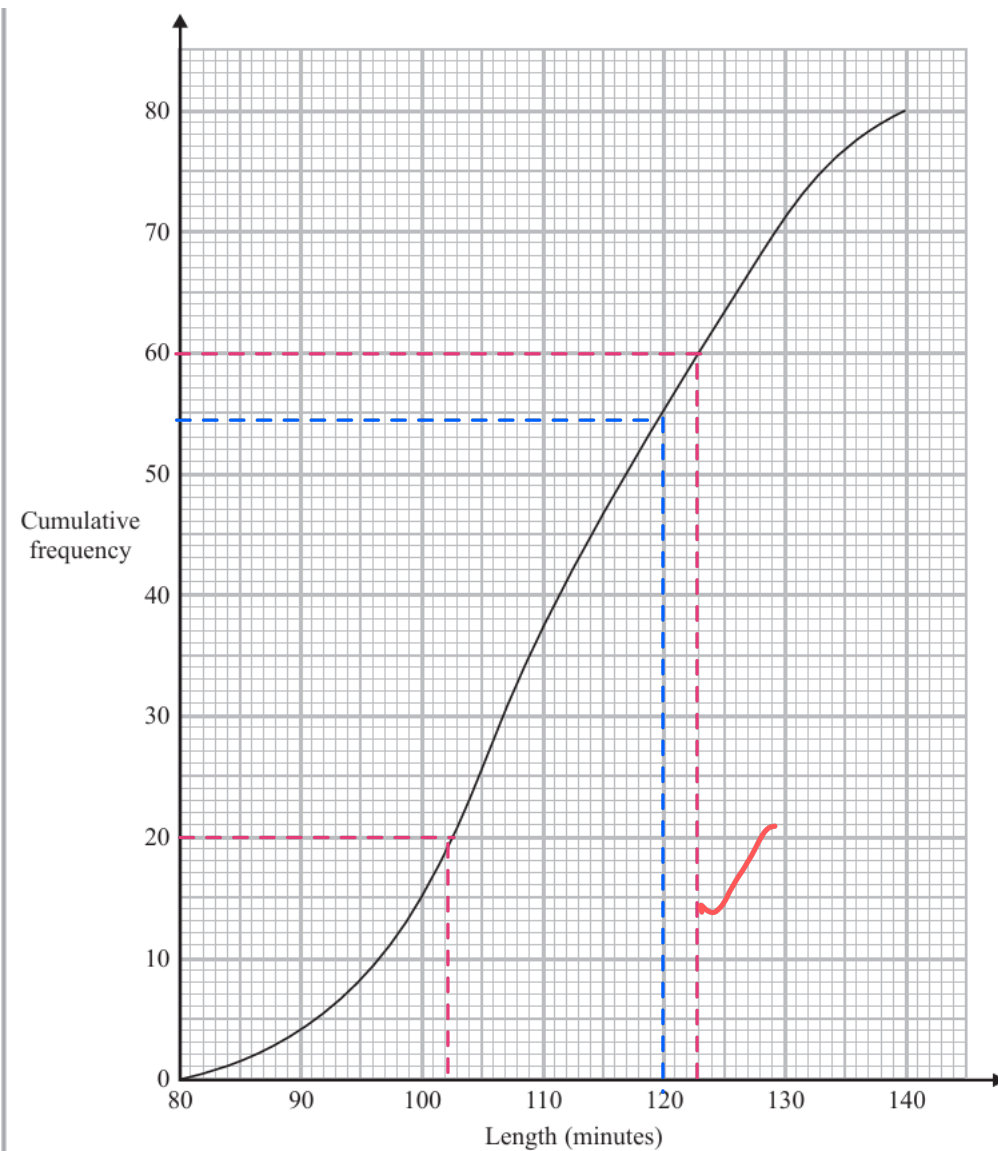
Work out the value of x .

$$\begin{aligned}
 \frac{8x + 264}{x + 39} &= 7 \\
 8x + 264 &= 7x + 273 \\
 x &= 9 \quad \checkmark
 \end{aligned}$$

[4]

Question 9

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.

$$123 - 102$$

21

minutes

(2)

Clare says,

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

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

$$\text{Over 120 mins} = 80 - 55 = 25$$

$$\% \text{ over } 120 = \frac{25}{80} \times 100$$

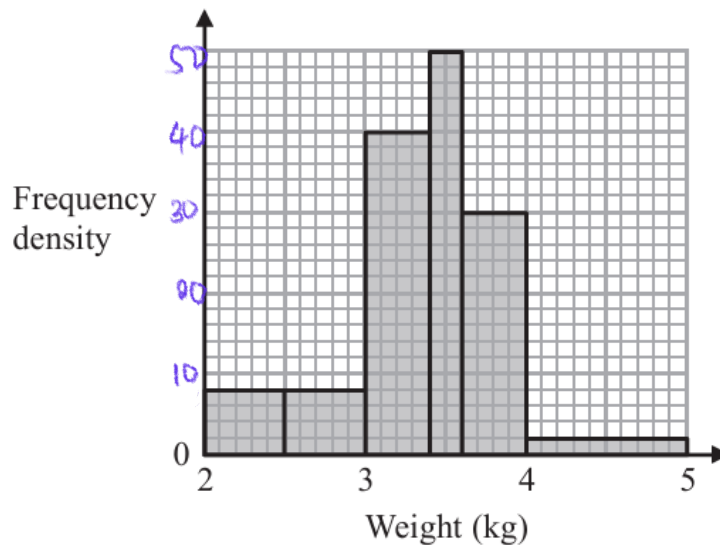
$$= 31.25\% < 35\%$$

No, not correct.

[2]

Question 10

The histogram shows information about the birth weights of some babies.



6 of these babies had a birth weight less than 2.5 kg or greater than 4 kg.

Work out the number of babies who had a birth weight between 2.5 kg and 4 kg.

Calculate area = frequency

$$(0.5 \times 4) + (1 \times 1) = 3$$

$$\begin{aligned} \uparrow \text{area unit} &= \frac{6}{3} \\ &= 2 \text{ babies} \end{aligned}$$

$$\begin{aligned} 2.5 < W < 4 &= (0.5 \times 8) + (0.4 \times 40) + (0.2 \times 50) + (0.4 \times 30) \\ &= 4 + 16 + 10 + 12 \\ &= \underline{\underline{42}} \end{aligned}$$

[3]

Total marks = 40

$$\text{Jesha} = 16 \text{ (C)}$$

$$\text{Erza} = 19 \text{ (B)}$$

$$\text{Alex} = 8 \text{ (A)}$$

$$\text{Elyah} = 21 \text{ (A)}$$

