

Cumulative Frequency

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

Total marks: **28**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** The table shows the times taken by 80 people to complete a puzzle.

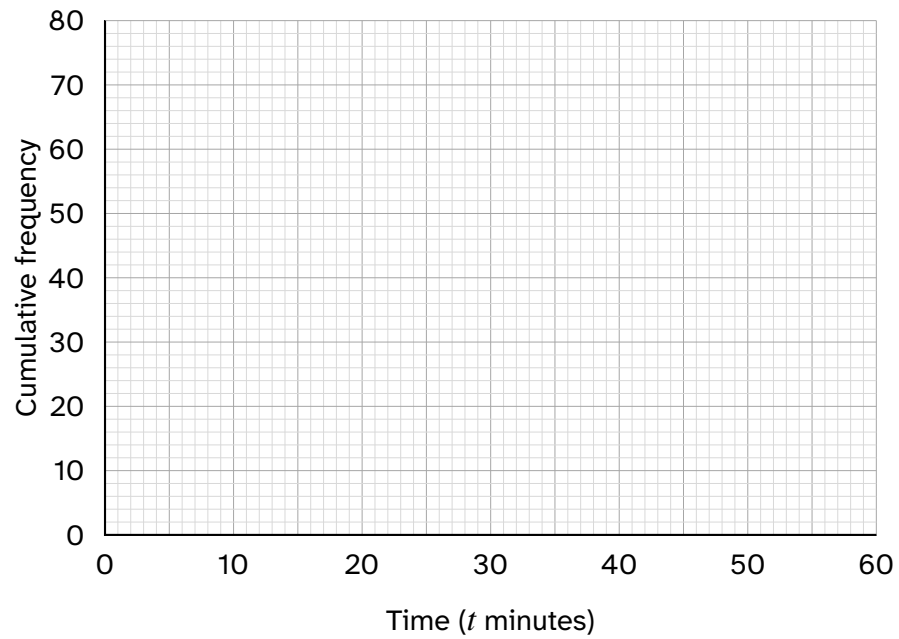
Time (t minutes)	Frequency
$0 < t \leq 10$	6
$10 < t \leq 20$	14
$20 < t \leq 30$	25
$30 < t \leq 40$	20
$40 < t \leq 50$	10
$50 < t \leq 60$	5

- (a) Complete the cumulative frequency table.

Time (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 mark]

- (b) Draw a cumulative frequency graph on the grid.



[2 marks]

- (c) Use your graph to estimate the median time.

[1 mark]

Answer _____ minutes

- (d) Use your graph to estimate the interquartile range.

[2 marks]

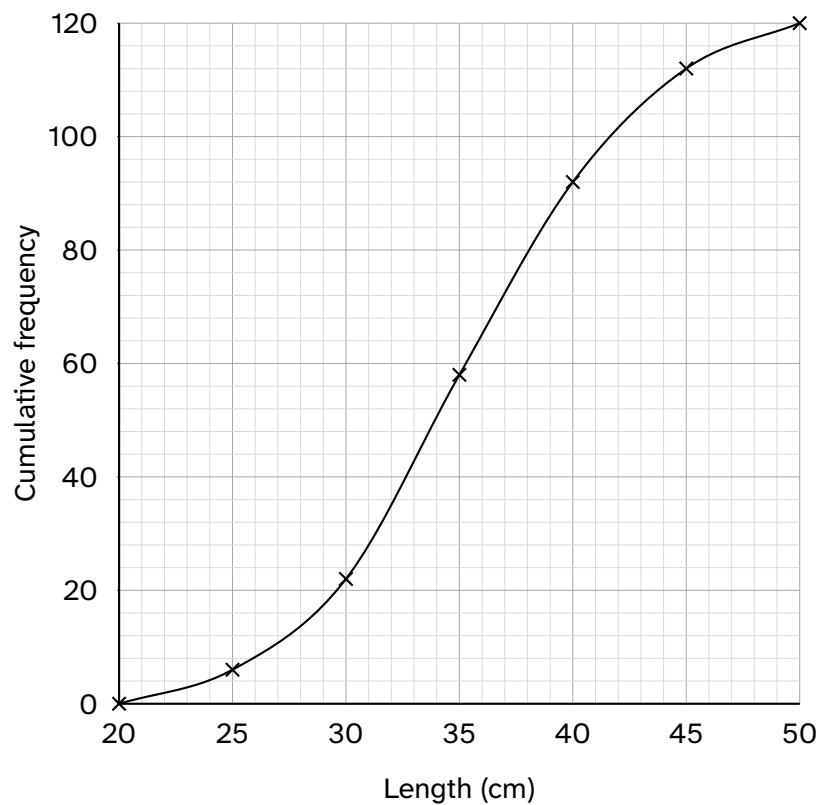
Answer _____ minutes

- (e) Estimate how many people took more than 45 minutes.

[2 marks]

Answer _____

- 2 The cumulative frequency graph shows information about the lengths of 120 fish caught in a lake.



- (a) Estimate the median length.

[1 mark]

Answer _____ cm

- (b) Fish shorter than 28 cm must be put back into the lake.
All the other fish can be kept.
Estimate the percentage of these fish that can be kept.

[3 marks]

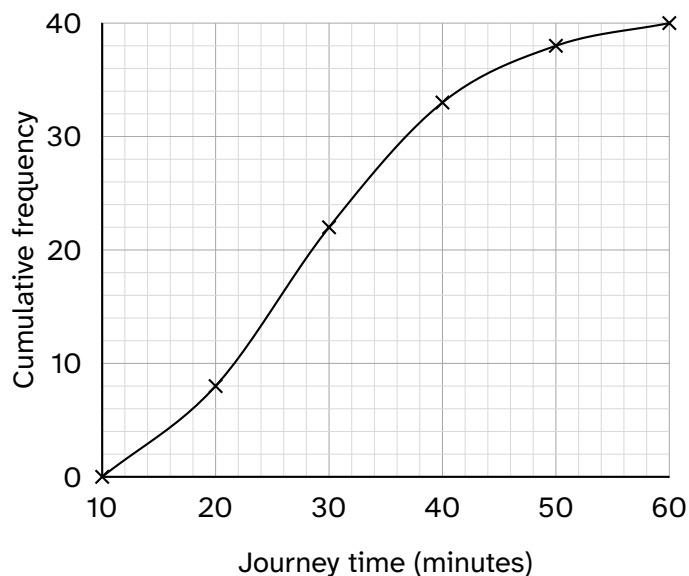
Answer _____ %

(c) Estimate the interquartile range.

[2 marks]

Answer _____ cm

- 3 The cumulative frequency graph shows information about the journey times of 40 commuters.



Ravi uses the graph to work out the median and the interquartile range. Here is his working.

Median = $(10 + 60) \div 2 = 35$ minutes
Lower quartile: read across from 10, so LQ = 22 minutes
Upper quartile: read across from 30, so UQ = 37 minutes
Interquartile range = $30 - 10 = 20$ minutes

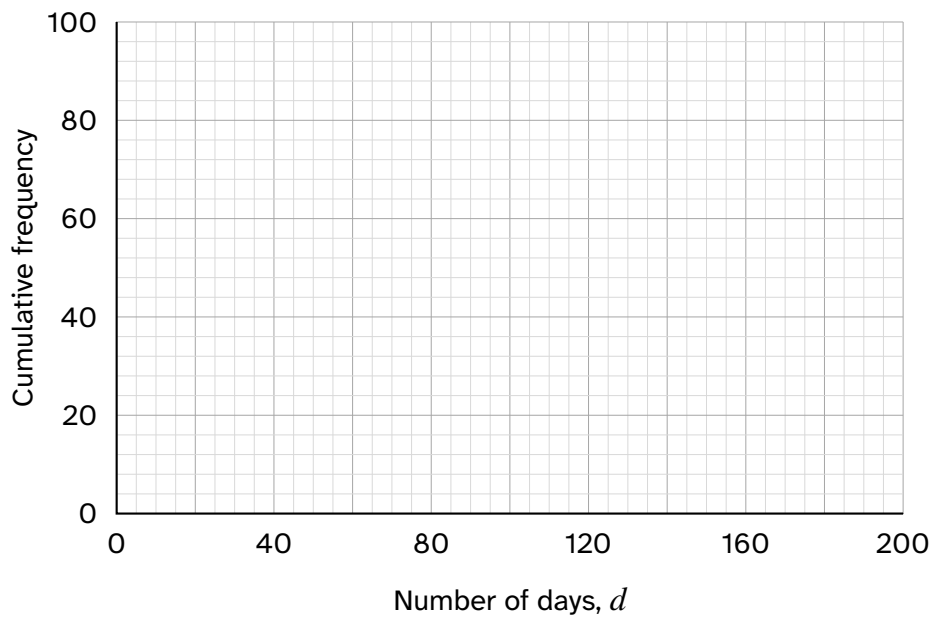
Make **two** criticisms of Ravi's working.

[2 marks]

- 4 Two brands of phone charging cable, P and Q , were tested. 100 cables of each brand were used every day until they stopped working. The number of days each cable lasted was recorded. The frequency table shows the results for brand P .

Number of days, d	Frequency
$0 \leq d < 40$	4
$40 \leq d < 80$	11
$80 \leq d < 120$	25
$120 \leq d < 160$	42
$160 \leq d < 200$	18

- (a) On the grid, draw a cumulative frequency diagram to represent the data.



[3 marks]

- (b) For brand Q ,
the median was 118 days
the interquartile range was 64 days.

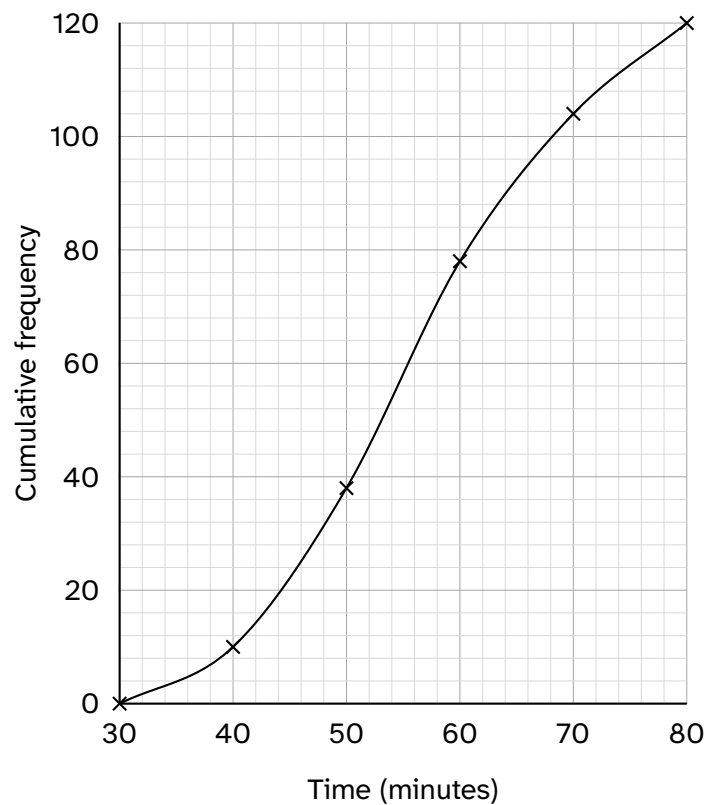
Compare the number of days that brands P and Q lasted.

Make one statement about the average and one statement about the spread.

Use statistical measures to support your statements.

[4 marks]

- 5 120 runners took part in a 10 km race.
The cumulative frequency graph shows information about their finishing times.



- (a) Estimate the percentage of the runners who finished in a time between 45 minutes and 60 minutes.

[3 marks]

Answer _____ %

- (b) The slowest 15 runners each get a “Never give up” medal.
Estimate the shortest time taken by a runner who got this medal.

[2 marks]

Answer _____ minutes