Your notes

GCSE Maths: revision notes

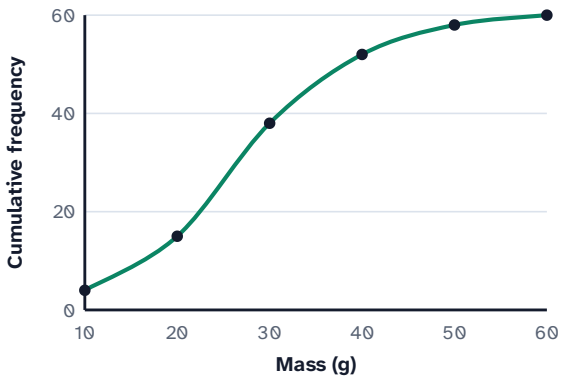
Cumulative frequency and box plots

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Cumulative frequency

- **Cumulative frequency** is a running total of the frequencies. Frequencies 4, 7, 9 and 5 give cumulative frequencies 4, 11, 20 and 25.
- Plot each **cumulative frequency** at the upper end of its group, and join the points with a smooth curve.

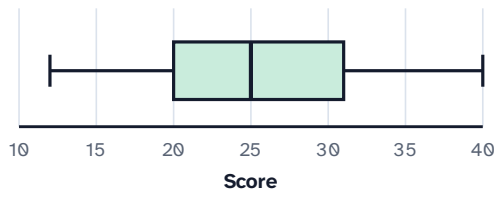


Reading the graph

- For n values, read the median at n ÷ 2, the **lower quartile** at n ÷ 4 and the **upper quartile** at 3n ÷ 4 on the **cumulative frequency** axis. Go across to the curve, then down.
- **Interquartile range** (IQR) = **upper quartile** – **lower quartile**. It measures the spread of the middle half of the data, and extreme values don't affect it.
- To find how many values are above a point, read up to the curve and subtract from the total.

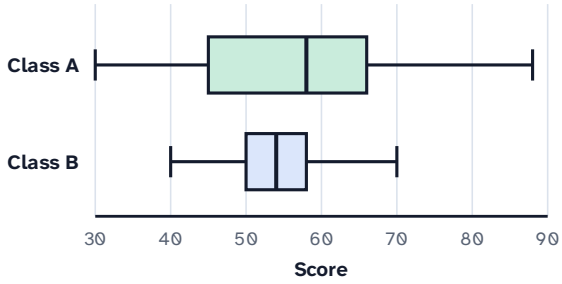
Box plots

- A **box plot** shows five values: the minimum, **lower quartile**, median, **upper quartile** and maximum.
- For minimum 12, **lower quartile** 20, median 25, **upper quartile** 31 and maximum 40, the IQR is 11 and the range is 28.



Comparing distributions

- Compare an average (the median) and a spread (the IQR or range), and write each comparison in context.
- 'Class A's median is higher, so on average Class A did better. Class B's IQR is smaller, so Class B's marks were more consistent.'



Key terms

Cumulative frequency	A running total of the frequencies.
Lower quartile	The value a quarter of the way through the ordered data.
Upper quartile	The value three quarters of the way through the ordered data.
Interquartile range	Upper quartile – lower quartile: the spread of the middle half of the data.
Box plot	A diagram showing the minimum, quartiles, median and maximum.
Distribution	The way a set of data is spread out.

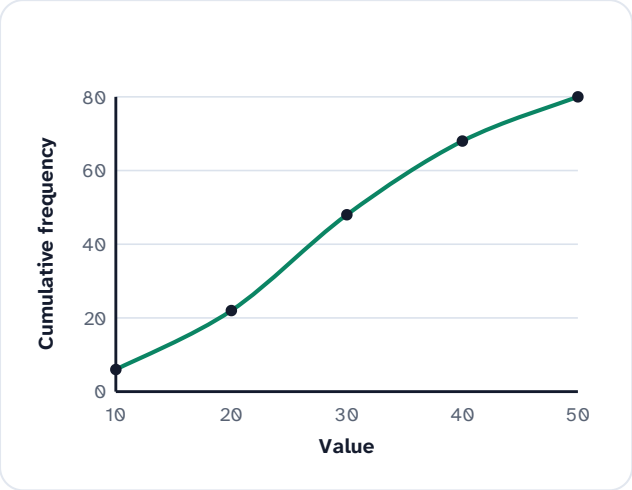
Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

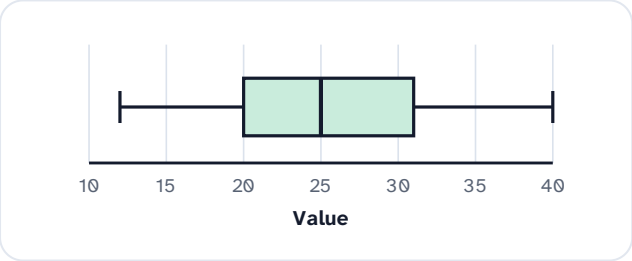
1. What is cumulative frequency?

Your notes

2. Where do you plot the points on a cumulative frequency graph?
3. The frequencies are 4, 7, 9 and 5. What are the cumulative frequencies?
4. There are 80 values. Where do you read the median on a cumulative frequency graph?



5. There are 80 values. Where do you read the lower quartile?
6. What does the interquartile range measure?
7. The lower quartile is 20 and the upper quartile is 31. What is the IQR?
8. A box plot shows a minimum of 12, lower quartile 20, median 25, upper quartile 31 and maximum 40. What is the range?



Answers

1. A running total of the frequencies
2. At the upper end of each group
3. 4, 11, 20, 25
4. At 40
5. At 20
6. The spread of the middle half of the data
7. 11
8. 28

What to do next

Practise 12 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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