

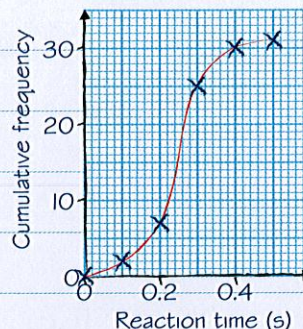
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A
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Cumulative frequency

In your exam you might have to draw a cumulative frequency graph, or use one to find the median or the interquartile range.

How to draw a cumulative frequency graph

Reaction time t (s)	Frequency	Cumulative frequency
$0 < t \leq 0.1$	2	2
$0.1 < t \leq 0.2$	5	$2 + 5 = 7$
$0.2 < t \leq 0.3$	18	$7 + 18 = 25$
$0.3 < t \leq 0.4$	5	$25 + 5 = 30$
$0.4 < t \leq 0.5$	1	$30 + 1 = 31$



1. Plot 0 at the beginning of the first class interval.
2. Plot each value at the UPPER end of its class interval.
3. Join your points with a SMOOTH CURVE.

Add a column for CUMULATIVE FREQUENCY to your frequency table.

Check that your final value is the same as the total frequency.

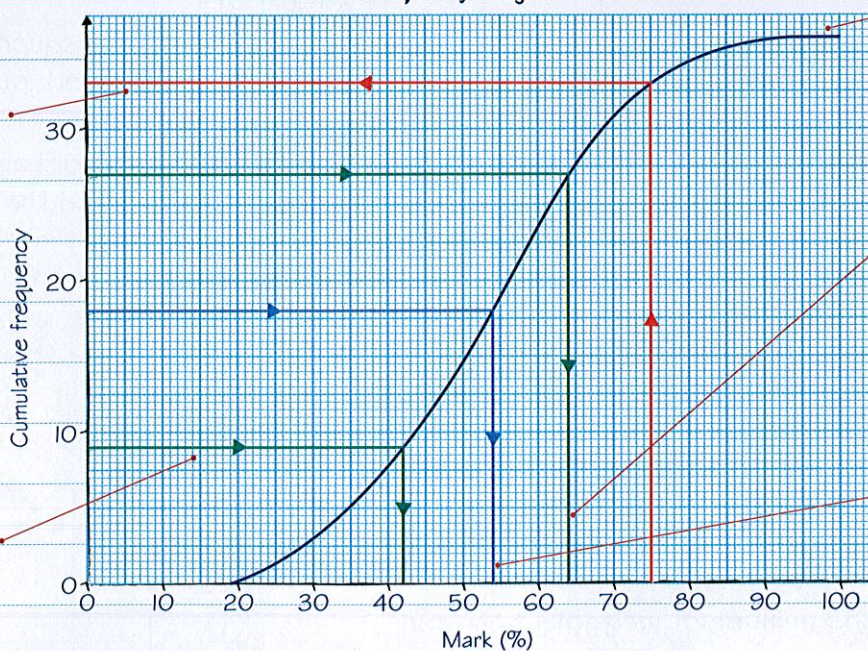
Here's another example:

Cumulative frequency diagram of test results

33 students scored less than 75%.
So $36 - 33 = 3$ students scored more than 75%.

The interquartile range is $64\% - 42\% = 22\%$

Draw the lower quartile at cumulative frequency $= \frac{36}{4}$.
The lower quartile was 42%.



There were 36 students in the class. (This is the FIRST FACT you should establish.)

Draw the upper quartile at cumulative frequency $= \frac{3 \times 36}{4}$.
The upper quartile was 64%.

Draw the median at cumulative frequency $= \frac{36}{2}$.
The median was 54%.

Now try this

grade B

edexcel

An operator took 100 calls at a call centre. The table gives information about the time it took the operator to answer each call.

- Complete the cumulative frequency column. (1 mark)
- Draw a cumulative frequency graph for your table. (2 marks)
- Use your graph to find an estimate for the interquartile range of the times. (2 marks)
- Use your graph to find an estimate for the number of calls the operator took more than 18 seconds to answer. (2 marks)

Time (t seconds)	Frequency	Cumulative frequency
$0 < t \leq 10$	16	16
$10 < t \leq 20$	34	
$20 < t \leq 30$	32	
$30 < t \leq 40$	14	
$40 < t \leq 50$	4	