Guide to: Cumulative frequency

maths Links

Explanation:

Cumulative frequency is a **running total** of the frequencies. Always plot cumulative frequency points at the **upper bound (end value)** of each class interval—never the midpoint—and join them with a smooth S-shaped curve.

For a total of **N** items, read across from $\frac{N}{2}$ (50%) for the **Median**, from $\frac{N}{4}$ (25%) for the **Lower Quartile (LQ)**, and from $\frac{3N}{4}$ (75%) for the **Upper Quartile (UQ)**. Then **IQR = UQ − LQ**.

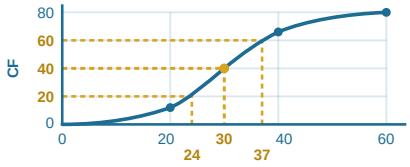
Example 1: Complete the cumulative frequency table for the times (t mins) of **80** runners.

Solution:

Time (t)	0<t≤20	20<t≤30	30<t≤40	40<t≤60
Freq.	12	28	26	14
Cum. Freq.	**12**	**40**	**66**	**80**

Plot at upper bounds: **(20, 12), (30, 40), (40, 66), (60, 80)**.

Example 2: From the curve for N = 80, CF = 20 gives **24 mins** and CF = 60 gives **37 mins**. Find the median and IQR.



Solution:

Median (CF = 40) = **30 mins**; LQ = 24, UQ = 37
IQR = 37 − 24 = **13 mins** → **Answer: Median 30, IQR 13 mins**

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