

Statistics

CBSE Class 10 Maths · Knowledge organiser

KEY DEFINITIONS

Class mark

The mid-point of a class interval, used as its representative value.

Modal class

The class with the highest frequency.

Cumulative frequency

The running total of frequencies up to the end of each class.

YOU SHOULD BE ABLE TO...

- Find the mean of grouped data and pick out the modal class correctly.
- Use the step-deviation method, the mode formula and the median formula with a full table.
- Write 5-mark answers with the complete table, find missing frequencies and use the empirical relationship.
- Handle inclusive classes, two unknown frequencies and questions that combine mean, median and mode.

COMMON MISTAKES

- ✗ Using the cf of the median class itself instead of the class *before* it.
- ✗ Taking f_0, f_2 from the wrong classes, or using the class with the largest cf as the modal class.
- ✗ Applying the formulas to non-continuous classes (1-10, 11-20, ...). First convert them to 0.5-10.5, 10.5-20.5, ...
- ✗ Forgetting to multiply by h in the step-deviation method.

KEY FORMULAS

Class mark	$x_i = \frac{\text{upper} + \text{lower limit}}{2}$
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Mean: direct	$\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$
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Assumed mean, $d_i = x_i - a$	$\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$
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Step deviation, $u_i = \frac{x_i - a}{h}$	$\bar{x} = a + \frac{\sum f_i u_i}{\sum f_i} \times h$
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Mode	$l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$
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Median	$l + \frac{\frac{n}{2} - cf}{f} \times h$
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Empirical relation	$3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$
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WORKED EXAMPLE

Classes 10-20, 20-30, 30-40, 40-50 with $f = 3, 5, 8, 4$.
With $a = 35$ and $h = 10$: $u = -2, -1, 0, 1$ and
 $\sum fu = -6 - 5 + 0 + 4 = -7$, $n = 20$. Mean
 $= 35 + 10 \left(\frac{-7}{20} \right) = 31.5$.