Statistics

Grouped data gives intervals rather than every original observation. Use class marks for the mean and cumulative frequency to locate the median class.

Formulas and methods

Class mark x_i = (lower limit + upper limit)/2. Direct mean = $\Sigma f_i x_i / \Sigma f_i$.

Assumed mean: mean = $a + \Sigma f_i d_i / \Sigma f_i$, where $d_i = x_i - a$. Step deviation: mean = $a + h\Sigma f_i u_i / \Sigma f_i$, $u_i = (x_i - a)/h$, using a convenient common h.

Median = $l + [(N/2 - cf)/f]h$. Here l is the lower boundary of the median class, cf the cumulative frequency before it, f its frequency and h its width.

Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)]h$. Here f_1 is the modal-class frequency, f_0 the previous frequency and f_2 the next; use appropriate continuous classes.

Worked examples

Find the mean for classes 0–10, 10–20, 20–30 with frequencies 2,5,3.

Class marks are 5,15,25. $\Sigma f = 10$ and $\Sigma fx = 2\times5 + 5\times15 + 3\times25 = 160$. Mean = 160/10 = 16.

Find median and mode for the same grouped data.

Cumulative frequencies are 2,7,10. N/2 = 5 lies in class 10–20. Median = $10 + [(5-2)/5]\times10 = 16$. Modal class is also 10–20: mode = $10 + [(5-2)/(10-2-3)]\times10 = 16$. These equal values are specific to this example.

Common mistake

cf in the median formula is the cumulative frequency before the median class. Do not use its upper boundary as l. Convert inclusive classes to continuous boundaries when needed.

Statistics — practice

Try these without looking at the answers. Show substitutions and units. Difficulty labels describe these questions, not official CBSE classifications.

1. [Foundation] Find the class mark of 30–40.

2. [Core] Find mean for classes 0–10,10–20,20–30 with frequencies 3,4,3.

3. [Core] Find median for classes 0–10,10–20,20–30 with frequencies 4,8,8.

4. [Challenge] Find mode for classes 0–10,10–20,20–30 with frequencies 3,7,5.

Statistics — answers

1. Find the class mark of 30–40.

(30+40)/2 = 35.

2. Find mean for classes 0–10,10–20,20–30 with frequencies 3,4,3.

Σfx = 15+60+75 = 150; N = 10. Mean = 15.

3. Find median for classes 0–10,10–20,20–30 with frequencies 4,8,8.

N/2 = 10; median class 10–20. Median = 10 + [(10−4)/8]×10 = 17.5.

4. Find mode for classes 0–10,10–20,20–30 with frequencies 3,7,5.

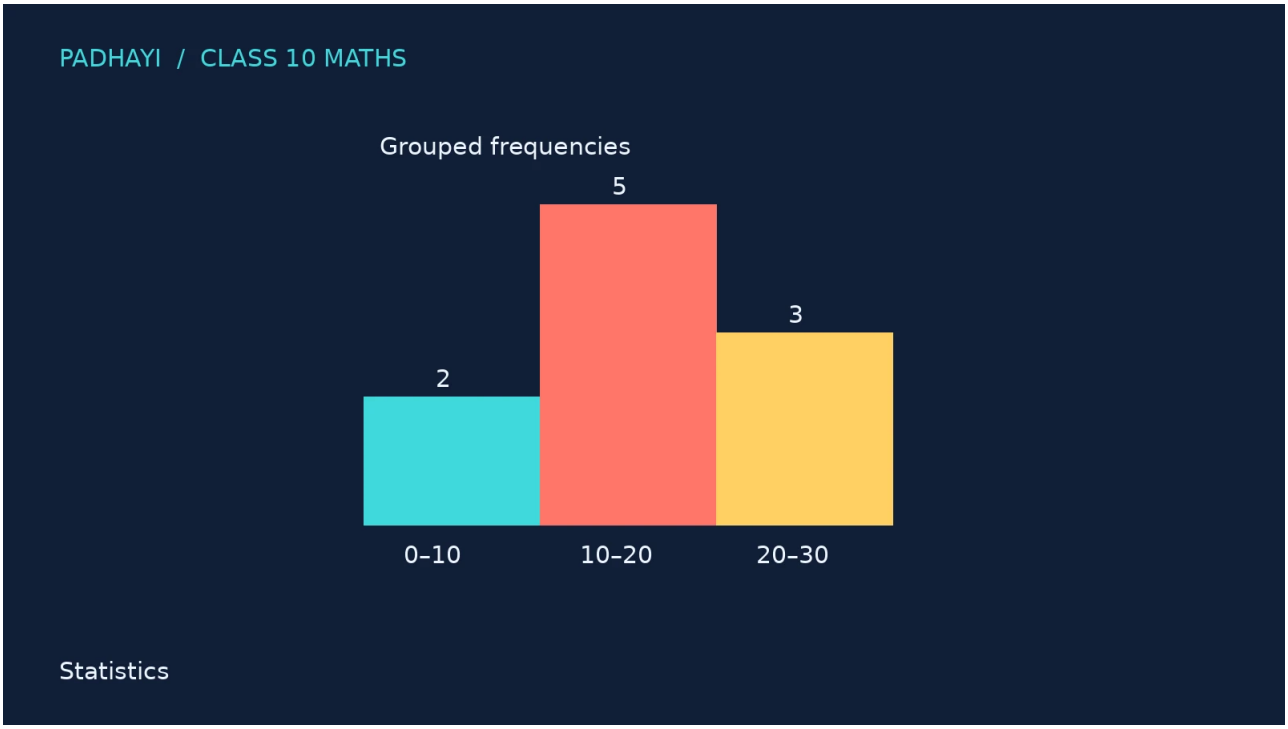
Modal class 10–20. Mode = 10 + [(7−3)/(14−3−5)]×10 = 50/3, approximately 16.67.

Next step: explain one method aloud, then solve a question from your NCERT textbook without using this sheet.

Original Padhayi revision material. Independent study aid; not an official CBSE or NCERT publication. Syllabus reference: CBSE Mathematics, Class X, 2026–27.

Official CBSE syllabus | NCERT textbooks

Visual reminder



Schematic illustration; diagrams are not necessarily drawn to scale.