Class 10 Maths Chapter 13: Statistics - Notes, Important Questions and MCQs (2026-27)

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These Statistics Class 10 notes cover NCERT Class 10 Maths Chapter 13: the mean of grouped data by the direct, assumed-mean and step-deviation methods, the mode and the median of grouped data – worked on one complete data table, with solved questions, 10 MCQs and a free PDF.

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Chapter Overview

Statistics deals with collecting, organising and interpreting data. When data are grouped into class intervals, we use each class mark (midpoint) to represent the class and apply formulas to find the three measures of central tendency: mean, median and mode.

The mean uses all observations, the median is the middle value and the mode is the most frequent value. They are approximately related by 3 Median = Mode + 2 Mean. (Cumulative frequency graphs/ogives are not in the 2026-27 syllabus.)

Important Topics and Concepts

Mean of Grouped Data

- Class mark x_i = (upper limit + lower limit)/2.
- Direct method: $\bar{x} = \Sigma f_i x_i / \Sigma f_i$.

- Assumed mean method: $d_i = x_i - a$, $\bar{x} = a + \Sigma f_i d_i / \Sigma f_i$.
- Step-deviation method: $u_i = (x_i - a)/h$, $\bar{x} = a + h \times \Sigma f_i u_i / \Sigma f_i$.
- All three methods give the same mean; step-deviation is fastest for large values.

Mode of Grouped Data

- Modal class: the class with the highest frequency.
- Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$.
- l = lower limit of modal class, h = class size, f_1 = frequency of modal class, f_0 = frequency of the preceding class, f_2 = frequency of the succeeding class.

Median of Grouped Data

- Find $n = \Sigma f$ and the cumulative frequencies (cf).
- Median class: the class whose cf is just greater than $n/2$.
- Median = $l + [(n/2 - cf)/f] \times h$.
- l = lower limit of median class, cf = cumulative frequency of the class before it, f = frequency of the median class, h = class size.

Empirical Relationship

- 3 Median = Mode + 2 Mean (approximately).
- Use it to find one measure when the other two are known.
- Mean is affected by extreme values; median is preferred when data have outliers; mode suits “most common” questions.

One Data Set, All Three Measures

Worked example used throughout this page.

Class	f	x_i	$f_i x_i$	cf
0–10	5	5	25	5
10–20	8	15	120	13
20–30	15	25	375	28
30–40	16	35	560	44
40–50	6	45	270	50
Total	50		1350	

Working for the Table

- Mean: $\bar{x} = 1350/50 = 27$.
- Mode: modal class 30–40 ($f_1 = 16$, $f_0 = 15$, $f_2 = 6$, $l = 30$, $h = 10$). Mode = $30 + (1/11) \times 10 \approx 30.91$.
- Median: $n/2 = 25$; median class 20–30 (cf before = 13, $f = 15$, $l = 20$). Median = $20 + (12/15) \times 10 = 28$.
- Missing frequency: if classes 0–10, 10–20, 20–30, 30–40 have frequencies 3, 5, p, 2 and the mean is 20: $(160 + 25p)/(10 + p) = 20 \rightarrow p = 8$.

Key Formulas at a Glance

Measure	Formula
Mean (direct)	$\Sigma f_i x_i / \Sigma f_i$
Mean (assumed mean)	$a + \Sigma f_i d_i / \Sigma f_i$
Mean (step deviation)	$a + h\ \Sigma f_i u_i / \Sigma f_i$
Mode	$l + (f_1 - f_0)h / (2f_1 - f_0 - f_2)$
Median	$l + (n/2 - cf)h / f$
Empirical relation	3 Median = Mode + 2 Mean

Important Formulas and Definitions

Formula / Term	Meaning / Use
Class mark	Midpoint of a class interval
Class size (h)	Difference between upper and lower limits
Frequency	Number of observations in a class
Cumulative frequency	Running total of frequencies
Modal class	Class with the highest frequency
Median class	Class containing the (n/2)th observation
Assumed mean (a)	A class mark chosen to simplify calculation

Short Answer Questions

Q1. Find the class mark of 10–25.

(10 + 25)/2 = 17.5.

Q2. If the mode and mean of a data are 12k and 15k, find the median.

3 Median = 12k + 30k = 42k → Median = 14k.

Q3. Find the class size of the classes 10–15, 15–20, 20–25.

Class size h = 15 − 10 = 5.

Q4. State the formula for the mode of grouped data and explain f_0 and f_2.

Mode = $l + (f_1 - f_0)h/(2f_1 - f_0 - f_2)$; f_0 is the frequency of the class before the modal class and f_2 of the class after it.

Q5. Find the median class for frequencies 4, 6, 10, 7, 3 in classes 0–10, …, 40–50.

n = 30, n/2 = 15; cf: 4, 10, 20 → median class 20–30.

Q6. Find the mean of 2, 4, 6, 8, 10 with frequencies 1, 2, 3, 2, 2.

Σfx = 2 + 8 + 18 + 16 + 20 = 64; Σf = 10; mean = 6.4.

Q7. Why do we use class marks to find the mean of grouped data?

We assume all observations in a class are centred at its midpoint, so the class mark represents

Q8. If mean = 20 and median = 18, find the mode.

Mode = 3(18) − 2(20) = 14.

Long Answer Questions

Q1. Find the mean of the following data by the step-deviation method: classes 0–10, 10–20, 20–30, 30–40, 40–50 with frequencies 5, 8, 15, 16, 6.

Take a = 25, h = 10; $u_i = (x_i - 25)/10 = -2, -1, 0, 1, 2$.

$f_iu_i = -10, -8, 0, 16, 12$; $\Sigma f_iu_i = 10$.

$\Sigma f_i = 50$.

$\bar{x} = 25 + 10 \times (10/50) = 25 + 2 = 27$.

Mean = 27 (same as the direct method).

Q2. The median of the following data is 28.5 and the total frequency is 60. Find x and y: classes 0–10, 10–20, 20–30, 30–40, 40–50, 50–60 with frequencies 5, x, 20, 15, y, 5.

$\Sigma f = 45 + x + y = 60 \rightarrow x + y = 15$.

Median 28.5 lies in 20–30: l = 20, f = 20, cf = 5 + x, h = 10.

$28.5 = 20 + [(30 - 5 - x)/20] \times 10 \rightarrow 8.5 = (25 - x)/2 \rightarrow x = 8$.

$y = 15 - 8 = 7$.

x = 8, y = 7.

Q3. Find the mode of: classes 1–3, 3–5, 5–7, 7–9, 9–11 with frequencies 7, 8, 2, 2, 1 (family sizes).

Modal class is 3–5 ($f_1 = 8$).

l = 3, h = 2, $f_0 = 7$, $f_2 = 2$.

Mode = $3 + [(8 - 7)/(16 - 7 - 2)] \times 2$.

$= 3 + (1/7) \times 2 = 3 + 0.286$.

Mode ≈ 3.29.

MCQs with Answers

1. Class mark of 20–30 is(a) 20 (b) 25 (c) 30 (d) 10Answer: (b) 25

2. The modal class is the class with(a) lowest frequency (b) highest frequency (c) middle position (d) highest cfAnswer: (b) highest frequency

3. 3 Median =(a) Mode + 2 Mean (b) 2 Mode + Mean (c) Mode − 2 Mean (d) Mean + ModeAnswer: (a) Mode + 2 Mean

4. In the median formula, cf is the cumulative frequency of(a) the median class (b) the class preceding the median class (c) the last class (d) the modal classAnswer: (b) the class preceding the median class

5. If mode = 30, mean = 27, then median ≈(a) 28 (b) 29 (c) 27.5 (d) 30Answer: (a) 28 – (30 +

6. Step-deviation u_i =(a) $x_i - a$ (b) $(x_i - a)/h$ (c) $h(x_i - a)$ (d) x_i/hAnswer: (b) $(x_i - a)/h$

7. Sum of deviations from the mean, $\Sigma f_i(x_i - \bar{x})$, is(a) 1 (b) 0 (c) n (d) $\bar{x}$Answer: (b) 0

8. Which measure is best for data with extreme values?(a) Mean (b) Median (c) Range (d) SumAnswer: (b) Median

9. For classes 0–10 (f 5), 10–20 (8), 20–30 (15), the cf of 20–30 is(a) 15 (b) 23 (c) 28 (d) 13Answer: (c) 28

10. Which topic is NOT in the 2026-27 syllabus?(a) Mean (b) Median (c) Mode (d) Ogive (cumulative frequency graph)Answer: (d) Ogive (cumulative frequency graph)

Quick Revision Points

- x_i = class mark.
- Mean: direct, assumed mean, step deviation – same answer.
- Mode = $l + (f_1 - f_0)h/(2f_1 - f_0 - f_2)$.
- Median = $l + (n/2 - cf)h/f$; cf of the previous class.
- 3 Median = Mode + 2 Mean.
- Classes must be continuous (convert 1–10, 11–20 to 0.5–10.5, …) before using formulas.

Chapter Summary

Statistics finds the mean, median and mode of grouped data. The mean uses class marks with the direct, assumed-mean or step-deviation method; the mode uses the modal class and its neighbouring frequencies; the median uses the median class found from cumulative frequencies.

The three measures are approximately linked by 3 Median = Mode + 2 Mean, and questions often ask you to find a missing frequency given one of these measures.

Exam Tips and PYQ Pattern

- A 5-mark question on mean/median/mode of grouped data appears almost every year – make a neat table.
- Write the formula, then the values of l, h, f_1, f_0, f_2 or cf before substituting.
- Check that classes are continuous; adjust inclusive classes first.
- Use step deviation to save time with large numbers.
- Ogives are not in the 2026-27 syllabus.

Frequently Asked Questions

Is this chapter in the 2026-27 CBSE syllabus?

Yes. It is part of the NCERT Class 10 Mathematics textbook and the rationalised CBSE syllabus for 2026-27.

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Yes. Use the free PDF link at the top of this page – no signup needed.

Median = l + [(n/2 − cf)/f] × h.

What is the empirical relationship between mean, median and mode?

3 Median = Mode + 2 Mean (approximately).

Conclusion

Statistics is a reliable 5–6 mark chapter if your tables are neat and formulas exact. Practise the worked data set and solved questions here, and save the free PDF for revision.

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Author Bio: Written and reviewed by the Nextoper Editorial Team, a group of CBSE mathematics educators who build chapter notes directly from the NCERT textbook and past board paper patterns.

Freshness Note: These notes follow the NCERT Class 10 Maths textbook, Mathematics (Reprint 2026-27), and the CBSE syllabus for the 2026-27 session. Last checked on 16 November 2026.