NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.3 | Statistics 2026-27

⚡ Quick Revision Box — Statistics Ex 14.3

- **Median Formula:** Median = l + (n/2 - cf)/(f) × h
- **Median class:** The class whose cumulative frequency first exceeds n/2
- **cf** = cumulative frequency of the class *before* the median class
- **l** = lower class boundary of the median class; **h** = class width
- **Number of questions in Ex 14.3:** 7 (all based on median of grouped data)
- **Chapter weightage:** Statistics carries significant marks in CBSE Class 10 board exams — questions appear in 2-3 mark and 5-mark sections
- **Key skill tested:** Constructing cumulative frequency table and applying the median formula correctly
- **Academic year:** Updated for 2026-27 CBSE syllabus

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The **NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.3** on this page cover all 7 questions from the Statistics exercise on median of grouped data, fully updated for the **2026-27** CBSE board exam. You can find complete [NCERT Solutions](#) for all subjects and classes on ncertbooks.net. These solutions follow the official [NCERT official textbook](#) and are designed to help you score full marks by showing every working step clearly.

This exercise is part of [NCERT Solutions for Class 10](#) and focuses exclusively on finding the **median of grouped data** using the cumulative frequency approach — one of the most frequently tested skills in CBSE board papers. Whether you are looking for *cbse class 10 maths ncert solutions* or step-by-step practice for your board exam, you are in the right place.

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Chapter Overview — Statistics Class 10 Chapter 14

Chapter 14 Statistics in the NCERT Class 10 Maths textbook covers three measures of central tendency for grouped data: **mean** (माध्य), **median** (माध्यिका), and **mode** (बहुलक). Exercise 14.3 specifically deals with finding the **median of grouped data** using the cumulative frequency table and the standard median formula.

For the 2026-27 CBSE board exam, Statistics is a high-scoring chapter. Questions from this chapter appear as 2-3 mark short-answer questions and 5-mark long-answer questions. Students who master the median formula and can construct a cumulative frequency table accurately will find this exercise straightforward.

Detail	Information
Chapter	Chapter 14 — Statistics
Exercise	Exercise 14.3
Textbook	NCERT Mathematics — Class 10
Class	Class 10
Subject	Mathematics
Number of Questions	7
Topic	Median of Grouped Data
Difficulty Level	Medium
Academic Year	2026-27

Key Concepts — Median of Grouped Data

Median (माध्यिका): The median is the middle value of a data set when arranged in order. For grouped data, we use the cumulative frequency table to locate the median class and then apply the formula.

Cumulative Frequency (संचयी बारंबारता): The running total of frequencies up to a given class interval. You add each class frequency to the sum of all previous frequencies.

Median Class: The class interval whose cumulative frequency first equals or exceeds n/2, where n is the total number of observations.

The standard median formula for grouped data is:

$$\text{Median} = l + \frac{(n/2 - cf)}{f} \times h$$

Where:

- l = lower class boundary (lower limit) of the median class

- n = total frequency (sum of all frequencies)
- cf = cumulative frequency of the class *preceding* the median class
- f = frequency of the median class
- h = class width (class size)

Why does the formula work? It assumes that observations within each class are uniformly distributed. We interpolate within the median class to find the exact point where half the data lies below and half above.

Mode formula (for reference):

$$\text{Mode} = l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times h$$

Mean formula using assumed mean method:

$$\overline{x} = a + (\Sigma\ f\_i\ d\_i)/(\Sigma\ f\_i)$$

NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.3 — All 7 Questions

Below are complete, step-by-step solutions for all 7 questions in Exercise 14.3. These are the exact solutions for the *ncert solutions for class 10 maths chapter 14 ex 14 3* that students search for before their board exams. Each solution shows the full cumulative frequency table and every working step.
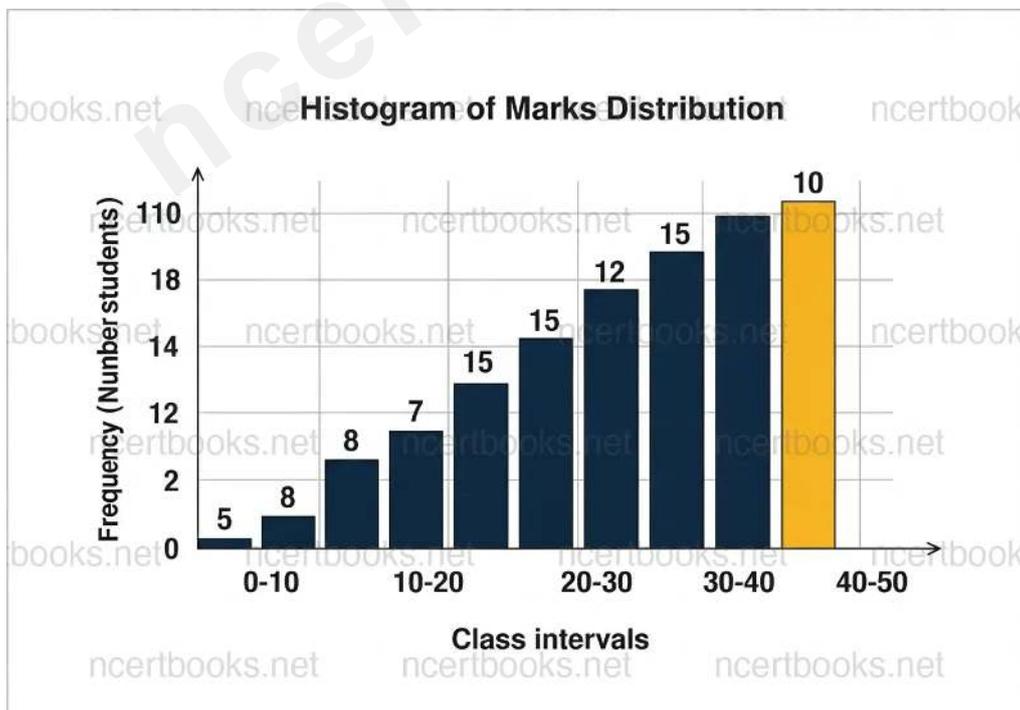

Fig 14.1: Histogram — bars represent frequency of each class interval

Question 1

Hard

The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (units): 65–85, 85–105, 105–125, 125–145, 145–165, 165–185, 185–205
Number of consumers: 4, 5, 13, 20, 14, 8, 4

Step 1: Construct the cumulative frequency table and find class marks.

Class Interval	Frequency (f)	Class Mark (x)	d = x − 135	u = d/20	fu	cf
65–85	4	75	−60	−3	−12	4
85–105	5	95	−40	−2	−10	9
105–125	13	115	−20	−1	−13	22
125–145	20	135	0	0	0	42
145–165	14	155	20	1	14	56
165–185	8	175	40	2	16	64
185–205	4	195	60	3	12	68
Total	**68**				**7**	

Step 2: Find the Median.

n = 68, so n/2 = 34. The cumulative frequency first exceeds 34 in the class **125–145**.

Median class = 125–145, l = 125, cf = 22, f = 20, h = 20

Median = 125 + (34 - 22)/(20) × 20 = 125 + 12/20 × 20 = 125 + 12 = 137

Step 3: Find the Mean (Step Deviation Method).

Assumed mean a = 135, h = 20, $\Sigma f_i u_i$ = 7, Σf_i = 68

$\overline{x} = a + (\Sigma f_i u_i)/(\Sigma f_i) \times h$ = 135 + 7/68 × 20 = 135 + 2.058 ≈ 137.06

Step 4: Find the Mode.

The modal class is **125–145** (highest frequency = 20). l = 125, f_1 = 20, f_0 = 13, f_2 = 14, h = 20

Mode = 125 + (20 - 13)/(2(20) - 13 - 14) × 20 = 125 + 7/13 × 20 = 125 + 10.77 ≈ 135.76

Step 5: Comparison.

Mean ≈ 137.06, Median = 137, Mode ≈ 135.76. The three measures are very close to each other, indicating the distribution is nearly symmetrical. The empirical relationship 3 × Median = Mode + 2 × Mean is approximately satisfied: 3 × 137 = 411 ≈ 135.76 + 274.12 = 409.88.

∴ **Median = 137 units, Mean ≈ 137.06 units, Mode ≈ 135.76 units.** All three values are approximately equal, showing a nearly symmetric distribution.

Board Exam Note: This type of question typically appears in the long answer (5-mark) sections of CBSE board papers. Show all three calculations — median, mean, and mode — and include the comparison statement to earn full marks.

Question 2

Medium

If the median of the distribution given below is 28.5, find the values of x and y.

Class interval: 0–10, 10–20, 20–30, 30–40, 40–50, 50–60
Frequency: 5, x, 20, 15, y, 5

Step 1: Set up the cumulative frequency table.

Class Interval	Frequency	Cumulative Frequency
0–10	5	5
10–20	x	5 + x
20–30	20	25 + x
30–40	15	40 + x
40–50	y	40 + x + y
50–60	5	45 + x + y

Step 2: Use total frequency.

Total n = 60 (given, since median is 28.5 and the distribution is of 60 observations).

$$45 + x + y = 60 \Rightarrow x + y = 15 \text{ ...(i)}$$

Step 3: Identify the median class.

n/2 = 30. Median = 28.5 lies in class **20–30**. So l = 20, cf = 5 + x, f = 20, h = 10.

Step 4: Apply the median formula.

$$28.5 = 20 + (30 - (5 + x))/(20) \times 10$$

$$8.5 = (25 - x)/(20) \times 10$$

$$8.5 = (25 - x)/(2)$$

$$17 = 25 - x \Rightarrow x = 8$$

Step 5: Find y using equation (i).

$$y = 15 - x = 15 - 8 = 7$$

∴ **x = 8 and y = 7**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Always write both equations clearly — one from total frequency and one from the median formula.

Question 3

Medium

A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 years.

Age (years): Below 20, Below 25, Below 30, Below 35, Below 40, Below 45, Below 50, Below 55, Below 60
Number of policy holders: 2, 6, 24, 45, 78, 89, 92, 98, 100

Step 1: Convert the cumulative frequency table into a class-wise frequency table.

Age (years)	Frequency (f)	Cumulative Frequency (cf)
18–20	2	2
20–25	4	6
25–30	18	24
30–35	21	45
35–40	33	78
40–45	11	89
45–50	3	92
50–55	6	98
55–60	2	100

Step 2: Find n/2.

n = 100, so n/2 = 50. The cumulative frequency first exceeds 50 in the class **35–40**.

Step 3: Apply the median formula.

l = 35, cf = 45, f = 33, h = 5

  Median = 35 + (50 - 45)/(33) × 5 = 35 + 5/33 × 5 = 35 + 25/33 = 35 + 0.76 ≈ 35.76

∴ **Median age = 35.76 years**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Note that the first class is 18–20 (not 0–20), so construct the class-wise table carefully before applying the formula.

Question 4

Medium

The lengths of 40 leaves of a plant are measured correct to nearest millimetre, and the data obtained is represented in the following table. Find the median length of the leaves.

Length (mm): 118–126, 127–135, 136–144, 145–153, 154–162, 163–171, 172–180
Number of leaves: 3, 5, 9, 12, 5, 4, 2

Key Concept: The class intervals are not continuous (e.g., 118–126, 127–135). To apply the median formula, convert them to continuous class intervals by subtracting 0.5 from the lower limit and adding 0.5 to the upper limit.

Step 1: Convert to continuous class intervals and build the cumulative frequency table.

Length (mm) — Continuous	Frequency (f)	Cumulative Frequency (cf)
117.5–126.5	3	3
126.5–135.5	5	8
135.5–144.5	9	17
144.5–153.5	12	29
153.5–162.5	5	34
162.5–171.5	4	38
171.5–180.5	2	40

Step 2: Find the median class.

n = 40, so n/2 = 20. The cumulative frequency first exceeds 20 in the class **144.5–153.5**.

Step 3: Apply the median formula.

l = 144.5, cf = 17, f = 12, h = 9

Median = 144.5 + (20 - 17)/(12) × 9 = 144.5 + 3/12 × 9 = 144.5 + 27/12 = 144.5 + 2.25 = 146.75

∴ **Median length = 146.75 mm**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. The conversion of discontinuous class intervals to continuous ones is a common step students miss — always check if intervals are continuous before applying the formula.
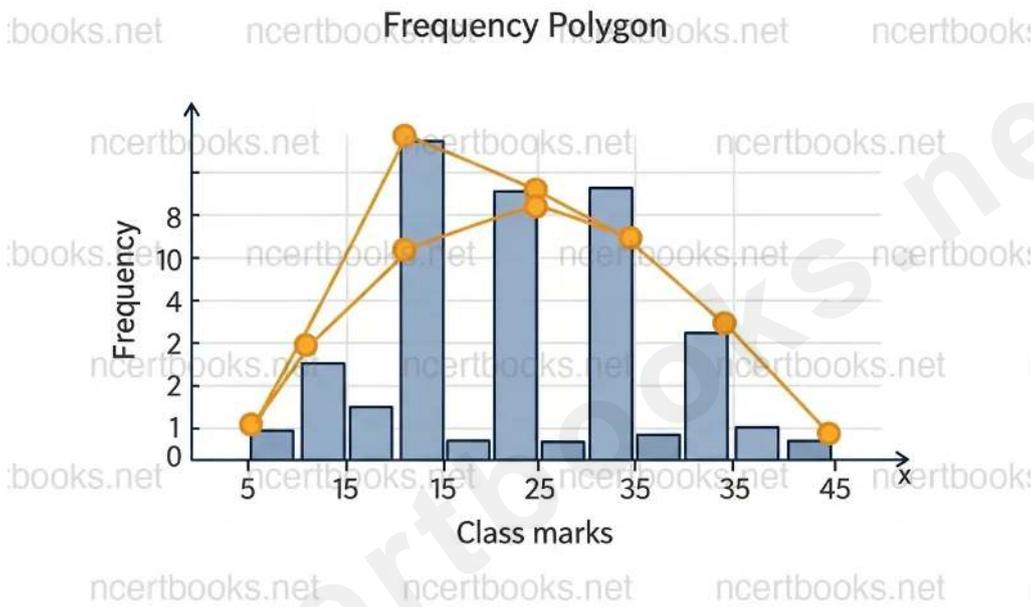

Fig 14.3: Frequency polygon — connect midpoints of histogram bar tops

Question 5

Medium

The following table gives the distribution of the lifetime of 400 neon lamps. Find the median lifetime of a lamp.

Lifetime (in hours): 1500–2000, 2000–2500, 2500–3000, 3000–3500, 3500–4000, 4000–4500, 4500–5000
Number of lamps: 14, 56, 60, 86, 74, 62, 48

Step 1: Construct the cumulative frequency table.

Lifetime (hours)	Frequency (f)	Cumulative Frequency (cf)
1500–2000	14	14
2000–2500	56	70

Lifetime (hours)	Frequency (f)	Cumulative Frequency (cf)
2500–3000	60	130
3000–3500	86	216
3500–4000	74	290
4000–4500	62	352
4500–5000	48	400

Step 2: Find the median class.

n = 400, so n/2 = 200. The cumulative frequency first exceeds 200 in the class **3000–3500**.

Step 3: Apply the median formula.

l = 3000, cf = 130, f = 86, h = 500

$$\text{Median} = 3000 + \frac{(200 - 130)}{86} \times 500 = 3000 + \frac{70}{86} \times 500 = 3000 + \frac{35000}{86} = 3000 + 406.98 \approx 3406.98$$

∴ **Median lifetime of a lamp ≈ 3406.98 hours**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Write the fraction (35000)/(86) clearly in your working and simplify to two decimal places.

Question 6

Hard

100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabet in the surnames was obtained as follows. Determine the median number of letters in the surnames. Find the mean number of letters in the surnames. Also, find the modal size of the surnames.

Number of letters: 1–4, 4–7, 7–10, 10–13, 13–16, 16–19
Number of surnames: 6, 30, 40, 16, 4, 4

Step 1: Construct the cumulative frequency table and class marks.

Letters	Freq (f)	cf	Class Mark (x)	d = x − 8.5	u = d/3	fu
1–4	6	6	2.5	−6	−2	−12
4–7	30	36	5.5	−3	−1	−30
7–10	40	76	8.5	0	0	0
10–13	16	92	11.5	3	1	16

Letters	Freq (f)	cf	Class Mark (x)	d = x − 8.5	u = d/3	fu
13–16	4	96	14.5	6	2	8
16–19	4	100	17.5	9	3	12
Total	**100**					**−6**

Step 2: Find the Median.

n = 100, n/2 = 50. The cf first exceeds 50 in class **7–10**.

l = 7, cf = 36, f = 40, h = 3

$$\text{Median} = 7 + \frac{(50 - 36)}{40} \times 3 = 7 + \frac{14}{40} \times 3 = 7 + \frac{42}{40} = 7 + 1.05 = 8.05$$

Step 3: Find the Mean.

Assumed mean a = 8.5, h = 3, $\sum f_i u_i = -6$, $\sum f_i = 100$

$$\bar{x} = 8.5 + \frac{-6}{100} \times 3 = 8.5 - 0.18 = 8.32$$

Step 4: Find the Mode.

Modal class = **7–10** (highest frequency = 40). l = 7, $f_1 = 40$, $f_0 = 30$, $f_2 = 16$, h = 3

$$\text{Mode} = 7 + \frac{(40 - 30)}{2(40) - 30 - 16} \times 3 = 7 + \frac{10}{34} \times 3 = 7 + \frac{30}{34} = 7 + 0.88 = 7.88$$

∴ **Median = 8.05 letters, Mean = 8.32 letters, Mode = 7.88 letters.**

Board Exam Note: This type of question typically appears in the long answer sections of CBSE board papers. Show all three calculations separately with clear headings for median, mean, and mode.

Question 7

Medium

The distribution below gives the weight of 30 students of a class. Find the median weight of the students.

Weight (kg): 40–45, 45–50, 50–55, 55–60, 60–65, 65–70, 70–75
Number of students: 2, 3, 8, 6, 6, 3, 2

Weight (kg)	Frequency (f)	Cumulative Frequency (cf)
40–45	2	2
45–50	3	5
50–55	8	13

Weight (kg)	Frequency (f)	Cumulative Frequency (cf)
55–60	6	19
60–65	6	25
65–70	3	28
70–75	2	30

Step 2: Find the median class.

n = 30, so n/2 = 15. The cumulative frequency first exceeds 15 in the class **55–60**.

Step 3: Apply the median formula.

l = 55, cf = 13, f = 6, h = 5

Median = 55 + (15 - 13)/(6) × 5 = 55 + 2/6 × 5 = 55 + 10/6 = 55 + 1.67 = 56.67

∴ **Median weight = 56.67 kg**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Always verify that your cf column adds up to n before applying the formula.

Formula Reference Table — Statistics Chapter 14

Formula Name	Formula	Variables Defined
Median of Grouped Data	Median = l + (n/2 - cf)/(f) × h	l = lower limit of median class, n = total freq, cf = preceding cf, f = median class freq, h = class width
Mode of Grouped Data	Mode = l + $(f_1 - f_0)$/$(2f_1 - f_0 - f_2)$ × h	f_1 = modal class freq, f_0 = preceding class freq, f_2 = succeeding class freq
Mean (Direct Method)	$\overline{x} = (\Sigma f\_i x\_i)/(\Sigma f\_i)$	x_i = class mark, f_i = frequency
Mean (Assumed Mean)	$\overline{x} = a + (\Sigma f\_i d\_i)/(\Sigma f\_i)$	a = assumed mean, $d_i = x_i - a$
Mean (Step Deviation)	$\overline{x} = a + (\Sigma f\_i u\_i)/(\Sigma f\_i) × h$	$u_i = d_i/h$
Empirical Relationship	3 × Median = Mode + 2 × Mean	Approximate relationship for unimodal data

Important Questions for CBSE Board Exam 2026-27 — Statistics Chapter 14

These questions are based on common patterns seen in CBSE board papers. Practising them will help you prepare for the 2026-27 board exam. These cover both *ncert exemplar class 10 maths solutions* style questions and standard board paper types.

1-Mark Questions — Statistics

- What is the formula for median of grouped data?
- Define cumulative frequency (संचयी बारंबारता).
- What is the empirical relationship between mean, median, and mode?

3-Mark Questions — Statistics

Q: The median of the following data is 525. Find the values of x and y if the total frequency is 100.

Model Answer: Set up the cumulative frequency table with unknowns x and y. Use the equation Σ f = 100 to get one equation in x and y. Then apply the median formula with the identified median class (the class containing the 50th value) to get a second equation. Solve simultaneously to find x and y. Always show both equations clearly.

5-Mark Questions — Statistics

Q: Find the mean, median, and mode of the following grouped data and verify the empirical relation.

Model Answer: Calculate all three measures using their respective formulas. For mean, use the step deviation method to simplify calculation. For median, find the median class using n/2. For mode, identify the modal class (highest frequency). Finally, verify: 3 × Median ≈ Mode + 2 × Mean. Show all tables and working steps for full marks.

Common Mistakes Students Make in Statistics Ex 14.3

These are the most frequent errors students make when solving *class 10 maths ncert solutions in hindi* and English medium. Avoiding these will directly improve your board exam score.

- **Mistake 1:** Using the upper class limit instead of the lower class limit as l.

  Why it's wrong: l in the median formula is always the *lower* boundary of the median class.

Correct approach: Identify the median class first, then take its lower limit as l.

- **Mistake 2:** Using the cumulative frequency of the median class as cf instead of the class before it.

  Why it's wrong: cf must be the cumulative frequency *preceding* the median class, not of the median class itself.

  Correct approach: Always take cf from the row just above the median class row in your table.

- **Mistake 3:** Not converting discontinuous class intervals to continuous ones (as in Question 4).

  Why it's wrong: If intervals are like 118–126, 127–135, there is a gap of 1. The formula requires continuous intervals.

  Correct approach: Subtract 0.5 from lower limits and add 0.5 to upper limits to make them continuous.

- **Mistake 4:** Incorrectly identifying the median class by looking for cf = n/2 exactly, rather than the first cf that equals or exceeds n/2.

  Why it's wrong: The median class is the one whose cf first reaches or crosses n/2.

  Correct approach: Scan the cf column and pick the first row where cf ≥ n/2.

- **Mistake 5:** Forgetting to write the final answer with correct units (hours, mm, kg, years).

  Why it's wrong: CBSE examiners deduct marks for missing units in measurement-based questions.

  Correct approach: Always write the unit alongside your final answer in the ncert-answer box.

Exam Tips for 2026-27 — Statistics Chapter 14 CBSE

These tips are based on the CBSE 2026-27 marking scheme and the question patterns observed in recent board papers. Use these to maximise your score in *cbse class 10 maths ncert solutions* based questions.

Key Points to Remember — Statistics Ex 14.3

- **Always draw the cumulative frequency table** — examiners award 1 mark specifically for the correct cf table, even if your final answer is slightly off.

- **Identify the median class clearly** — write "Median class = [interval]" as a separate line before applying the formula. This earns a step mark.
- **Show substitution in the formula** — write Median = l + (n/2 - cf)/(f) × h and then substitute values. Never skip straight to the answer.
- **Chapter weightage for 2026-27:** Statistics (Chapter 14) and Probability (Chapter 15) together form Unit 6, which carries significant marks in the CBSE Class 10 board paper.
- **Empirical relation question:** If asked to compare mean, median, and mode, always write the empirical relation 3 × Median = Mode + 2 × Mean and verify it numerically.
- **Last-minute revision checklist:** (a) Memorise the median formula; (b) Practice building cf tables quickly; (c) Know how to identify modal class and median class; (d) Remember to check for discontinuous intervals; (e) Write units in every final answer.

Frequently Asked Questions — Class 10 Maths Chapter 14 Ex 14.3

What is the median formula for grouped data in Class 10 Maths Chapter 14?

The median formula for grouped data is Median = l + (n/2 - cf)/(f) × h. Here, l is the lower limit of the median class, n is total frequency, cf is the cumulative frequency before the median class, f is the frequency of the median class, and h is the class width. You must first construct a cumulative frequency table to identify the median class before applying this formula.

How do I find the median class in grouped data?

To find the median class, first calculate n/2 where n is the total number of observations. Then build a cumulative frequency (cf) column by adding frequencies progressively. The median class is the class interval whose cumulative frequency first equals or exceeds n/2. For example, if n = 68, you look for the class where cf first reaches or crosses 34.

How many questions are in NCERT Solutions Class 10 Maths Chapter 14 Exercise 14.3?

Exercise 14.3 of NCERT Class 10 Maths Chapter 14 Statistics contains exactly 7 questions. All 7 questions are based on finding the median of grouped data. Some questions also ask for mean and mode in addition to median (Questions 1 and 6). All 7 questions with complete step-by-step solutions are provided on this page.

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

The empirical relationship between the three measures of central tendency is: 3 × Median = Mode + 2 × Mean. This is an approximate relationship that holds for moderately skewed distributions. In Question 1 of Exercise 14.3, the mean ≈ 137.06, median = 137, and mode ≈ 135.76, which approximately satisfies this relationship. CBSE board exams often ask students to verify this empirical relation.

Why do we convert discontinuous class intervals to continuous ones before finding the median?

The median formula assumes that data is continuously distributed within each class. When class intervals have gaps (e.g., 118–126, 127–135), the data is not truly continuous. To correct this, we subtract 0.5 from each lower limit and add 0.5 to each upper limit, creating continuous intervals (e.g., 117.5–126.5, 126.5–135.5). This is demonstrated in Question 4 of Exercise 14.3 and is a common exam question in CBSE Class 10 board papers.

Source: ncertbooks.net — Updated for CBSE Academic Year 2026-27