NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.2 | Statistics 2026-27

⚡ Quick Revision Box — Statistics Ex 14.2

- **Chapter:** Chapter 14 — Statistics | Class 10 Maths (NCERT)
- **Exercise:** 14.2 — Mode of Grouped Data (6 questions)
- **Mode Formula:** Mode = $l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times h$
- **Modal Class:** The class interval with the highest frequency in the distribution table
- **Key Variables:** l = lower boundary of modal class, f_1 = modal class frequency, f_0 = preceding class frequency, f_2 = succeeding class frequency, h = class width
- **Mean Formula (for reference):** $\bar{x} = a + (\Sigma f_i u_i)/(\Sigma f_i) \times h$ (step-deviation method)
- **Syllabus Status:** Fully included in 2026-27 CBSE Class 10 Maths syllabus
- **Exam Weightage:** Statistics carries 11 marks in CBSE Class 10 board exams

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The **NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.2** on this page cover all 6 questions from the Mode of Grouped Data section, fully updated for the **2026-27** CBSE board exam. You can find these solutions as part of our complete NCERT Solutions for Class 10 resource. Every answer is written step by step with the mode formula applied clearly so you can follow along and write the same in your exam. These solutions are also available in our broader NCERT Solutions library covering all classes and subjects. The official textbook is available on the NCERT official website.

Chapter Overview — Statistics Class 10 Chapter 14 (CBSE 2026-27)

Chapter 14 Statistics in the NCERT Class 10 Maths textbook deals with three measures of central tendency for grouped data: mean, mode, and median. Exercise 14.2 specifically focuses on the **Mode of Grouped Data** — one of the most frequently tested topics in CBSE board exams. This chapter builds directly on your knowledge of frequency distribution tables from earlier classes.

For the 2026-27 CBSE board exam, Statistics carries a weightage of **11 marks** under the unit Statistics and Probability. Questions from this exercise typically appear as 2-mark or 3-mark problems. You need to correctly identify the modal class and apply the formula accurately to score full marks.

Detail	Information
Chapter	Chapter 14 — Statistics

Detail	Information
Exercise	Exercise 14.2
Textbook	NCERT Mathematics — Class 10
Topic	Mode of Grouped Data
Number of Questions	6
Marks Weightage (Unit)	11 Marks (Statistics & Probability)
Difficulty Level	Easy to Medium
Academic Year	2026-27

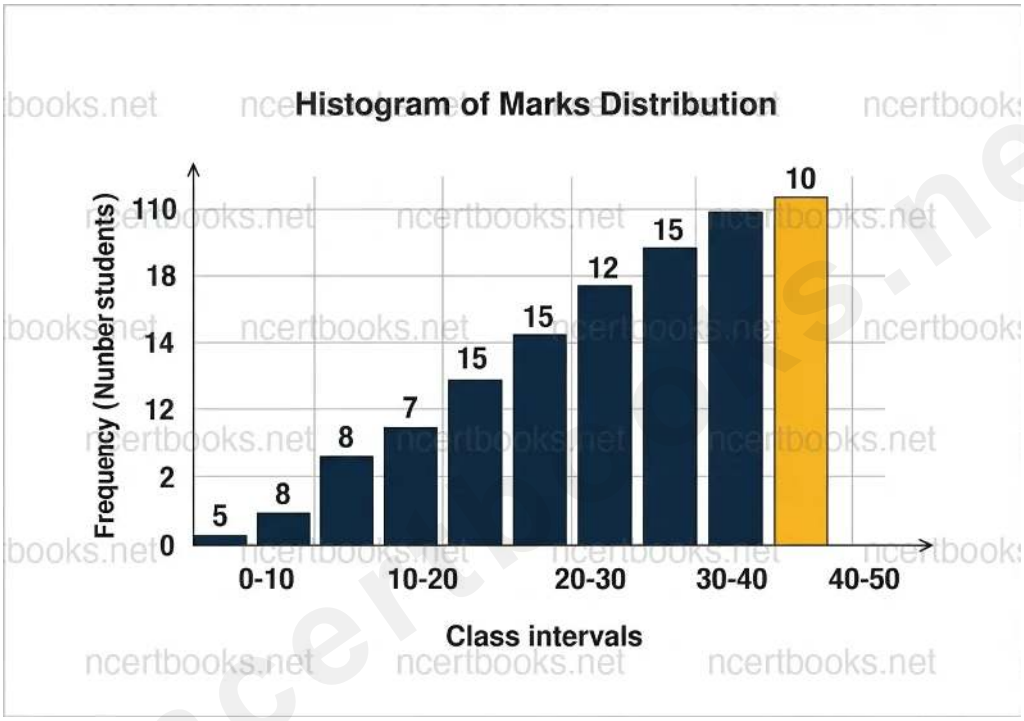

Fig 14.1: Histogram — bars represent frequency of each class interval

Key Concepts: Mode of Grouped Data — Class 10 Statistics

Mode (बहुलक): The mode is the value that appears most frequently in a data set. In grouped data, we cannot find the exact mode by inspection, so we use the modal class and the mode formula.

Modal Class (बहुलक वर्ग): The class interval with the highest frequency is called the modal class. When two classes have the same highest frequency, the data is called bimodal — in such cases, NCERT problems at this level typically have a unique modal class.

Mode Formula for Grouped Data:

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

Where:

- l = lower class boundary of the modal class
- f_1 = frequency of the modal class
- f_0 = frequency of the class preceding the modal class
- f_2 = frequency of the class succeeding the modal class
- h = class width (size of the class interval)

Why does this formula work? The formula estimates the mode by assuming that within the modal class, the mode lies closer to the boundary of the adjacent class that has the higher frequency. The fraction $(f_1 - f_0)/(2f_1 - f_0 - f_2)$ acts as a weight that pushes the mode towards the denser side.

Mean vs Mode: Mean considers every data value and gives the arithmetic centre. Mode only reflects the most common group. If the mean age of hospital patients is 35.38 years but the mode is 36.8 years, the mode tells you the most common age group while the mean tells you the average across all patients.

NCERT Solutions for Class 10 Maths Chapter 14 Ex 14.2 — All 6 Questions Solved

Below are complete, step-by-step solutions for all 6 questions in Exercise 14.2. These are the exact questions from your NCERT textbook, solved using the standard CBSE method. Each solution shows how to identify the modal class and apply the mode formula correctly.

Question 1

Medium

The following table shows the ages of the patients admitted in a hospital during a year. Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.

Age (in years): 5–15, 15–25, 25–35, 35–45, 45–55, 55–65
Number of patients: 6, 11, 21, 23, 14, 5

Finding the Mode

Step 1: Identify the modal class. The class with the highest frequency is **35–45** (frequency = 23).

Step 2: Identify the values for the formula:

- l = 35 (lower boundary of modal class)

- f_1 = 23 (frequency of modal class)
- f_0 = 21 (frequency of preceding class 25–35)
- f_2 = 14 (frequency of succeeding class 45–55)
- h = 10 (class width)

Step 3: Apply the mode formula:

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

$$= 35 + (23 - 21)/(2(23) - 21 - 14) \times 10$$

$$= 35 + (2)/(46 - 35) \times 10$$

$$= 35 + 2/11 \times 10$$

$$= 35 + 20/11 = 35 + 1.81 \approx 36.8 \text{ years}$$

∴ **Mode = 36.8 years**

Finding the Mean (Step-Deviation Method)

Step 1: Find the midpoint x_i of each class: 10, 20, 30, 40, 50, 60. Take assumed mean a = 40, h = 10.

Step 2: Calculate u_i = (x_i - 40)/(10): −3, −2, −1, 0, 1, 2.

Step 3: Calculate f_i u_i: −18, −22, −21, 0, 14, 10.

Step 4: Sum up: Σ f_i = 80, Σ f_i u_i = -18 - 22 - 21 + 0 + 14 + 10 = -37.

$$\bar{x} = a + (\Sigma f_i u_i)/(\Sigma f_i) \times h = 40 + -37/80 \times 10 = 40 - 4.625 = 35.375 \approx 35.38 \text{ years}$$

∴ **Mean ≈ 35.38 years**

Interpretation: The mean age of patients is approximately 35.38 years, meaning the average patient is around 35 years old. The mode is 36.8 years, indicating the most common age group of patients admitted is 35–45 years. Both values are close, confirming that the data is fairly symmetric around the 35–45 age group.

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Show all formula substitution steps clearly to earn full marks.

Question 2

Easy

The following data gives information on the observed lifetimes (in hours) of 225 electrical components. Determine the modal lifetimes of the components.

Lifetimes (hours): 0–20, 20–40, 40–60, 60–80, 80–100, 100–120
Frequency: 10, 35, 52, 61, 38, 29

Step 1: Identify the modal class. The highest frequency is **61**, which belongs to the class **60–80**.

Step 2: Note the required values:

- l = 60
- f_1 = 61
- f_0 = 52 (class 40–60)
- f_2 = 38 (class 80–100)
- h = 20

Step 3: Apply the formula:

$$\text{Mode} = 60 + (61 - 52)/(2(61) - 52 - 38) \times 20$$

$$= 60 + (9)/(122 - 90) \times 20$$

$$= 60 + 9/32 \times 20$$

$$= 60 + 180/32 = 60 + 5.625 = 65.625 \text{ hours}$$

∴ **Modal Lifetime = 65.625 hours**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Clearly state the modal class before substituting values.

Question 3

Medium

The following data gives the distribution of total monthly household expenditure of 200 families of a village. Find the modal monthly expenditure of the families. Also, find the mean monthly expenditure.

Expenditure (₹): 1000–1500, 1500–2000, 2000–2500, 2500–3000, 3000–3500, 3500–4000, 4000–4500, 4500–5000
Number of families: 24, 40, 33, 28, 30, 22, 16, 7

Finding the Modal Monthly Expenditure

Step 1: The highest frequency is **40**, corresponding to the class **1500–2000**. This is the modal class.

Step 2: Identify values:

- $l = 1500$
- $f_1 = 40$
- $f_0 = 24$ (class 1000–1500)
- $f_2 = 33$ (class 2000–2500)
- $h = 500$

Step 3: Apply the formula:

$$\text{Mode} = 1500 + (40 - 24)/(2(40) - 24 - 33) \times 500$$

$$= 1500 + (16)/(80 - 57) \times 500$$

$$= 1500 + 16/23 \times 500$$

$$= 1500 + (8000)/(23) = 1500 + 347.83 \approx 1847.83$$

∴ **Modal Monthly Expenditure ≈ ₹1847.83**

Finding the Mean Monthly Expenditure

Step 1: Find midpoints x_i: 1250, 1750, 2250, 2750, 3250, 3750, 4250, 4750. Take a = 2750, h = 500.

Step 2: Calculate u_i = (x_i - 2750)/(500): −3, −2, −1, 0, 1, 2, 3, 4.

Step 3: Calculate f_i u_i: −72, −80, −33, 0, 30, 44, 48, 28.

Step 4: Σ f_i = 200, Σ f_i u_i = -72 - 80 - 33 + 0 + 30 + 44 + 48 + 28 = -35.

$$\bar{x} = 2750 + -35/200 \times 500 = 2750 - 87.5 = 2662.5$$

∴ **Mean Monthly Expenditure = ₹2662.50**

Board Exam Note: This type of question typically appears in long answer sections of CBSE board papers. Finding both mode and mean earns separate marks — do not skip either part.

Question 4

Medium

The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode and mean of this data. Interpret the two measures.

Number of students per teacher: 15–20, 20–25, 25–30, 30–35, 35–40, 40–45, 45–50, 50–55
Number of states/UT: 3, 8, 9, 10, 3, 0, 0, 2

Finding the Mode

Step 1: The highest frequency is **10**, belonging to the class **30–35**. This is the modal class.

Step 2: Note the values:

- l = 30
- f_1 = 10
- f_0 = 9 (class 25–30)
- f_2 = 3 (class 35–40)
- h = 5

Step 3: Apply the formula:

$$\text{Mode} = 30 + (10 - 9)/(2(10) - 9 - 3) \times 5$$

$$= 30 + (1)/(20 - 12) \times 5$$

$$= 30 + 1/8 \times 5 = 30 + 0.625 = 30.625$$

∴ **Mode = 30.625 students per teacher**

Finding the Mean

Step 1: Midpoints x_i: 17.5, 22.5, 27.5, 32.5, 37.5, 42.5, 47.5, 52.5. Take a = 32.5, h = 5.

Step 2: $u_i = (x_i - 32.5)/(5)$: −3, −2, −1, 0, 1, 2, 3, 4.

Step 3: $f_i u_i$: −9, −16, −9, 0, 3, 0, 0, 8.

Step 4: $\Sigma f_i = 35$, $\Sigma f_i u_i = -9 - 16 - 9 + 0 + 3 + 0 + 0 + 8 = -23$.

$$\bar{x} = 32.5 + -23/35 \times 5 = 32.5 - 115/35 = 32.5 - 3.286 \approx 29.2$$

∴ **Mean ≈ 29.2 students per teacher**

Interpretation: The mode (30.625) tells us that the most common teacher-student ratio across states is approximately 30–35 students per teacher. The mean (29.2) represents the overall average ratio. Most states have around 30 students per teacher, which is close to both values, suggesting a fairly consistent distribution.

Board Exam Note: This type of question typically appears in long answer sections of CBSE board papers. Writing the interpretation in 1–2 sentences after the calculation earns the final mark.

Question 5

Easy

The given distribution shows the number of runs scored by some top batsmen of the world in one-day international cricket matches. Find the mode of the data.

Runs scored: 3000–4000, 4000–5000, 5000–6000, 6000–7000, 7000–8000, 8000–9000, 9000–10000, 10000–11000
Number of batsmen: 4, 18, 9, 7, 6, 3, 1, 1

Step 1: The highest frequency is **18**, belonging to the class **4000–5000**. This is the modal class.

Step 2: Note the values:

- $l = 4000$
- $f_1 = 18$
- $f_0 = 4$ (class 3000–4000)
- $f_2 = 9$ (class 5000–6000)
- $h = 1000$

Step 3: Apply the formula:

$$\text{Mode} = 4000 + (18 - 4)/(2(18) - 4 - 9) \times 1000$$

$$= 4000 + (14)/(36 - 13) \times 1000$$

$$= 4000 + 14/23 \times 1000$$

$$= 4000 + 608.695 \approx 4608.7 \text{ runs}$$

∴ **Mode ≈ 4608.7 runs**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. A large class width (h = 1000) is common in such problems — do not confuse it with h = 10.

Question 6

Easy

A student noted the number of cars passing through a spot on a road for 100 periods each of 3 minutes and summarised it in the table given below. Find the mode of the data.

Number of cars: 0–10, 10–20, 20–30, 30–40, 40–50, 50–60, 60–70, 70–80
Frequency: 7, 14, 13, 12, 20, 11, 15, 8

Step 1: The highest frequency is **20**, belonging to the class **40–50**. This is the modal class.

Step 2: Note the values:

- $l = 40$
- $f_1 = 20$
- $f_0 = 12$ (class 30–40)
- $f_2 = 11$ (class 50–60)
- $h = 10$

Step 3: Apply the formula:

$$\text{Mode} = 40 + (20 - 12)/(2(20) - 12 - 11) \times 10$$

$$= 40 + (8)/(40 - 23) \times 10$$

$$= 40 + 8/17 \times 10$$

$$= 40 + 80/17 = 40 + 4.706 \approx 44.7 \text{ cars}$$

∴ **Mode ≈ 44.7 cars**

Board Exam Note: This type of question typically appears in 2-3 mark sections of CBSE board papers. Always verify which class has the single highest frequency before applying the formula.

Formula Reference Table — Statistics Chapter 14 (Class 10 Maths)

Formula Name	Formula	Variables
Mode of Grouped Data	$\text{Mode} = l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times h$	l = lower boundary, f_1 = modal freq, f_0 = preceding freq, f_2 = succeeding freq, h = class width
Mean (Direct Method)	$\bar{x} = (\Sigma f_i x_i)/(\Sigma f_i)$	f_i = frequency, x_i = midpoint
Mean (Assumed Mean Method)	$\bar{x} = a + (\Sigma f_i d_i)/(\Sigma f_i)$	a = assumed mean, $d_i = x_i - a$
Mean (Step-Deviation Method)	$\bar{x} = a + (\Sigma f_i u_i)/(\Sigma f_i) \times h$	$u_i = (x_i - a)/(h)$, h = class width
Empirical Relationship	3 × Median = Mode + 2 × Mean	Approximate relation for moderately skewed data

Solved Examples Beyond NCERT — Mode of Grouped Data

These extra examples go slightly beyond the NCERT exercise to prepare you for CBSE board-style variations and NCERT Exemplar Class 10 Maths questions.

Extra Example 1

Easy

The marks obtained by 30 students in a test are given below. Find the modal marks.

Marks: 0–10, 10–20, 20–30, 30–40, 40–50
Frequency: 2, 5, 11, 9, 3

Step 1: Modal class = 20–30 (highest frequency = 11).

Step 2: l = 20, f_1 = 11, f_0 = 5, f_2 = 9, h = 10.

$$\text{Mode} = 20 + (11 - 5)/(2(11) - 5 - 9) \times 10 = 20 + 6/8 \times 10 = 20 + 7.5 = 27.5$$

∴ **Modal Marks = 27.5**

Extra Example 2

Medium

The daily wages (in ₹) of 50 workers in a factory are given. Find the mode: Wages: 100–120, 120–140, 140–160, 160–180, 180–200. Frequency: 5, 10, 15, 12, 8.

Step 1: Modal class = 140–160 (highest frequency = 15).

Step 2: l = 140, f_1 = 15, f_0 = 10, f_2 = 12, h = 20.

$$\text{Mode} = 140 + (15 - 10)/(2(15) - 10 - 12) \times 20 = 140 + 5/8 \times 20 = 140 + 12.5 = 152.5$$

∴ **Modal Daily Wage = ₹152.5**

Extra Example 3 — Using Empirical Relation

Hard

If the mean of a distribution is 54 and the median is 52, find the approximate mode using the empirical relationship.

Key Concept: The empirical relationship between mean, median, and mode is Mode = 3 × Median - 2 × Mean.

Mode = 3 × 52 - 2 × 54 = 156 - 108 = 48

∴ **Approximate Mode = 48**

Important Questions for CBSE Board Exam 2026-27 — Statistics Ex 14.2

1-Mark Questions

1. **Q:** What is the modal class?
   A: The class interval with the highest frequency in a grouped frequency distribution is called the modal class (बहुलक वर्ग).
2. **Q:** Write the formula for mode of grouped data.
   A: Mode = $l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times h$
3. **Q:** In the mode formula, what does f_0 represent?
   A: f_0 is the frequency of the class interval immediately before (preceding) the modal class.

3-Mark Questions

1. **Q:** A frequency distribution has the following data. Find the mode: Class: 10–20, 20–30, 30–40, 40–50, 50–60. Frequency: 5, 8, 20, 10, 7.
   A: Modal class = 30–40 (f = 20). $l = 30$, $f_1 = 20$, $f_0 = 8$, $f_2 = 10$, $h = 10$. Mode = 30 + 12/22 × 10 = 30 + 5.45 = 35.45.
2. **Q:** Explain with an example why mode is preferred over mean when data is skewed.
   A: When a data set has extreme values (outliers), the mean gets pulled towards them and may not represent the typical value. Mode, however, reflects the most common value and is unaffected by outliers. For example, if most patients in a hospital are aged 35–45 but a few are aged 80+, the mode (≈37) better represents the typical patient than the mean (which would be higher due to elderly outliers).

5-Mark Questions

1. **Q:** The following table gives the monthly consumption of electricity of 68 consumers of a locality. Find the mode and mean. 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.
   A: Modal class = 125–145 (f = 20). $l = 125$, $f_1 = 20$, $f_0 = 13$, $f_2 = 14$, $h = 20$. Mode = 125 + 7/13 × 20 = 125 + 10.77 ≈ 135.76 units. For mean: midpoints 75, 95, 115, 135, 155, 175, 195; a = 135, h = 20; u_i: −3, −2, −1, 0, 1, 2, 3; f_i u_i: −12, −10, −13, 0, 14, 16, 12; Σ f_i u_i = 7; Mean = 135 + 7/68 × 20 = 135 + 2.06 ≈ 137.06 units.

Common Mistakes Students Make in Mode Problems — Class 10 Statistics

Mistake 1: Using the class with the second-highest frequency as the modal class.
Why it's wrong: The modal class is always the one with the single highest frequency. If two classes tie for the highest frequency, the data is bimodal — NCERT problems at this level avoid this, but you must still identify the correct single highest frequency.
Correct approach: Scan all frequencies, find the maximum, and identify its class interval.

Mistake 2: Using the upper class boundary instead of the lower class boundary for l.
Why it's wrong: The formula requires the lower boundary l of the modal class. Using the upper boundary gives a completely wrong answer.
Correct approach: l is always the smaller value in the modal class interval (e.g., for 35–45, l = 35).

Mistake 3: Mixing up f_0 and f_2.
Why it's wrong: f_0 is the frequency of the class before the modal class; f_2 is the frequency of the class after it. Swapping them changes the answer.
Correct approach: Always write out the table row above and below the modal class and label them clearly before substituting.

Mistake 4: Forgetting to multiply by h at the end.
Why it's wrong: The formula has × h at the end. Omitting this gives a fraction between 0 and 1, which makes no sense as a mode value.
Correct approach: Write the full formula first, then substitute values step by step.

Mistake 5: Computing $2f_1 - f_0 - f_2$ incorrectly by subtracting $f_0 + f_2$ from f_1 instead of $2f_1$.
Why it's wrong: The denominator is $2f_1 - f_0 - f_2$, not $f_1 - f_0 - f_2$.
Correct approach: Double f_1 first, then subtract f_0 and f_2 separately.

Exam Tips for 2026-27 CBSE Board — Statistics Chapter 14

- **Write the formula first:** In the 2026-27 CBSE marking scheme, writing the correct formula earns 1 mark even if the final answer has an arithmetic error. Never skip the formula step.
- **Label every variable:** After writing the formula, list l, f_1, f_0, f_2, h explicitly before substituting. This earns step marks in 3-mark and 5-mark questions.
- **Round correctly:** CBSE expects answers rounded to 2 decimal places unless stated otherwise. Write 36.81 rather than just 36.8 when your calculation gives more digits.

- **For questions asking both mode and mean:** Attempt both parts. Even if you make an error in mode, you can still earn full marks on the mean part. The two calculations are independent.
- **Interpretation questions:** Questions 1 and 4 ask you to interpret the measures. Write one clear sentence comparing mean and mode and what each tells you about the data. This 1-mark interpretation is easy to score.
- **Revision checklist for 2026-27 exam:** ✅ Mode formula by heart ✅ How to find modal class ✅ Difference between f_0 and f_2 ✅ Step-deviation method for mean ✅ Empirical relation: Mode = 3 Median − 2 Mean

Frequently Asked Questions — Statistics Exercise 14.2 (Class 10 Maths)

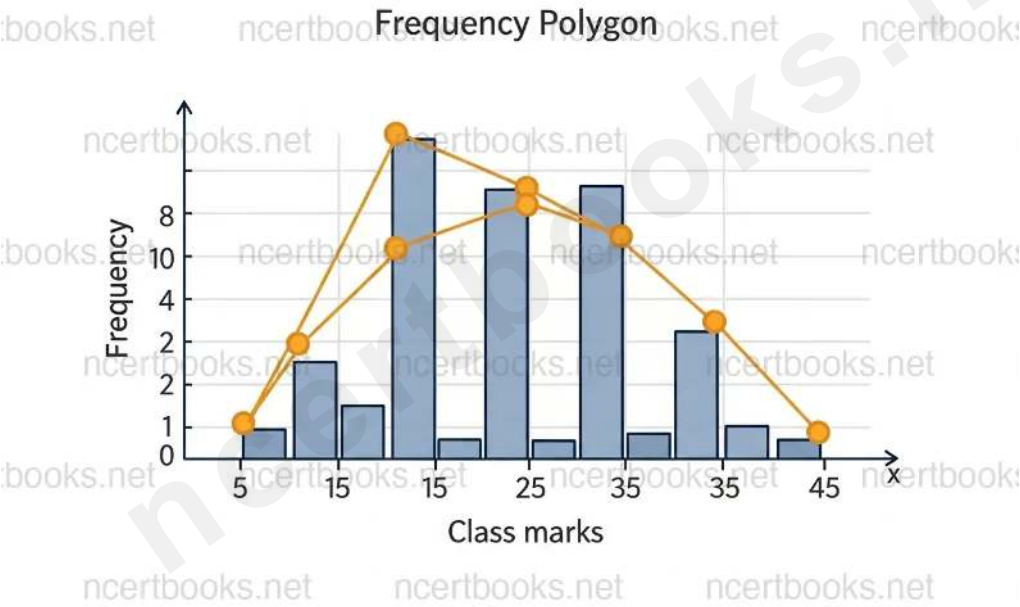

Fig 14.3: Frequency polygon — connect midpoints of histogram bar tops

What is the formula for mode of grouped data in Class 10 Maths?

The mode formula for grouped data is Mode = $l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times h$. Here, l is the lower class boundary of the modal class, f_1 is its frequency, f_0 is the frequency of the class before it, f_2 is the frequency of the class after it, and h is the class width. This formula is used in all 6 questions of Exercise 14.2 and must be memorised for the 2026-27 CBSE board exam.

How do you identify the modal class in a frequency distribution table?

The modal class is the class interval that has the highest frequency in the grouped frequency distribution table. Scan all the frequency values, find the largest one, and the corresponding class interval is your modal class. Once you identify this class, note its lower boundary l, its frequency f_1, and the frequencies of the classes immediately before and after it (f_0 and f_2) to apply the mode formula.

How many questions are there in Exercise 14.2 of Class 10 Maths Statistics?

Exercise 14.2 of Class 10 Maths Chapter 14 Statistics contains exactly 6 questions. All questions require finding the mode of grouped data using the standard formula. Questions 1, 3, and 4 also ask you to find the mean and compare or interpret both measures. Questions 2, 5, and 6 require only the mode. This exercise is fully part of the 2026-27 CBSE syllabus.

What is the difference between mean and mode in Statistics Class 10?

Mean (माध्य) is the arithmetic average calculated using all data values — it uses the direct method, assumed mean method, or step-deviation method. Mode (बहुलक) is the value that occurs most frequently, found using the modal class formula for grouped data. Mean considers every observation; mode focuses only on the most common group. For example, in Question 1, the mean age is 35.38 years while the mode is 36.8 years — mode tells you the most common patient age group, while mean gives the overall average.

Is Exercise 14.2 of Class 10 Maths Statistics in the 2026-27 CBSE syllabus?

Yes, Exercise 14.2 on Mode of Grouped Data is fully included in the 2026-27 CBSE Class 10 Maths syllabus. Statistics is part of the unit Statistics and Probability, which carries significant marks in the board exam. All 6 questions in this exercise are relevant for your board preparation. You can also check the official syllabus on the NCERT official website for confirmation.

How to find mode of grouped data when class width is large (like h = 1000)?

The mode formula works the same way regardless of class width. In Question 5 of Exercise 14.2, the class width is 1000 (runs scored by batsmen). You simply substitute h = 1000 in the formula: Mode = $l + (f_1 - f_0)/(2f_1 - f_0 - f_2) \times 1000$. A large h value means the mode shifts more within the modal class, so the final answer will be a larger number. Always write the class width value clearly before substituting to avoid errors.
