

NCERT Solutions for Class 10 Maths Chapter 14 Statistics

| Updated 2026-27

🚩 Quick Revision Box — Statistics Chapter 14

- **Chapter:** Chapter 14 — Statistics | Class 10 Maths (NCERT)
- **Exercise 14.1 Focus:** Mean of Grouped Data using Direct, Assumed Mean, and Step Deviation methods
- **Direct Method Formula:** $\bar{x} = (\sum f_i x_i) / (\sum f_i)$
- **Assumed Mean Method:** $\bar{x} = A + (\sum f_i d_i) / (\sum f_i)$, where $d_i = x_i - A$
- **Step Deviation Method:** $\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h$, where $u_i = (x_i - A) / h$
- **Class Mark:** $x_i = (\text{Upper limit} + \text{Lower limit}) / 2$
- **Total Questions in Ex 14.1:** 9 questions — all solved below
- **Board Exam Weightage:** Statistics carries 6–11 marks in CBSE Class 10 board exam 2026-27

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The **NCERT Solutions for Class 10 Maths Chapter 14 Statistics** provided here cover all 9 questions of Exercise 14.1 with complete, step-by-step working — updated for the **2026-27** CBSE board exam. You can find these solutions as part of our comprehensive [NCERT Solutions for Class 10](#) resource hub. Whether you need the direct method, assumed mean method, or step deviation method, every solution is explained clearly so you understand *why* each step works — not just *what* the answer is. These solutions are based on the [official NCERT textbook](#) and align with the latest rationalised syllabus. For all subjects and classes, visit our [NCERT Solutions](#) main page.

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NCERT Solutions for Class 10 Maths Chapter 14 Statistics — Chapter Overview

Chapter 14 Statistics in the Class 10 NCERT Maths textbook (Mathematics — Textbook for Class X, published by NCERT) teaches you how to analyse and interpret data that is presented in grouped form. Exercise 14.1 focuses entirely on finding the **mean of grouped data** (समूहीकृत आँकड़ों का माध्य) using three different methods. This is a core skill tested in CBSE board exams every year.

The chapter builds on your knowledge of basic statistics from Class 9, where you worked with ungrouped data. Here, data is organised into class intervals with frequencies, making direct calculation harder — which is why you need systematic methods. The three methods taught are the **Direct Method**, the **Assumed Mean Method** (कल्पित माध्य विधि), and the **Step Deviation Method** (पग-विचलन विधि).

In CBSE board exams, Statistics typically carries **6 to 11 marks**. Questions from this chapter appear as 2-mark and 3-mark problems (short answer) and occasionally as 5-mark problems (long answer). Knowing which method to choose — and showing all working — is what earns you full marks.

Detail	Information
Chapter	Chapter 14 — Statistics
Textbook	Mathematics — Textbook for Class X (NCERT)
Class	Class 10 (Grade 10)
Subject	Mathematics
Exercise Covered	Exercise 14.1 (9 Questions)
Board Exam Weightage	6–11 marks (approx.)
Difficulty Level	Medium
Academic Year	2026-27

Key Concepts and Formulas — Mean of Grouped Data

Class Mark (वर्ग चिह्न)

For each class interval, the **class mark** x_i is the midpoint of that interval. You calculate it as:

$$x_i = (\text{Upper Class Limit} + \text{Lower Class Limit}) / (2)$$

For example, for the class interval 10–20, the class mark is $x_i = (10 + 20) / (2) = 15$.

Direct Method (प्रत्यक्ष विधि)

Use the Direct Method when the class marks x_i are small numbers and calculations are manageable. The formula is:

$$\bar{x} = (\sum f_i x_i) / (\sum f_i)$$

Here, f_i is the frequency of the i -th class and x_i is its class mark. You multiply each f_i by x_i , sum all products, and divide by the total frequency.

Assumed Mean Method (कल्पित माध्य विधि)

When class marks are large, computing $f_i x_i$ directly becomes tedious. Choose any convenient value A (usually the middle class mark) as the assumed mean. Then calculate deviations $d_i = x_i - A$ and use:

$$\bar{x} = A + (\sum f_i d_i) / (\sum f_i)$$

Step Deviation Method (पग-विचलन विधि)

When class sizes h are equal and deviations d_i are multiples of h , divide the deviations by h to get step deviations $u_i = (x_i - A)/h$. The formula becomes:

$$\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h$$

This method gives the simplest arithmetic, especially when all class intervals have equal width.

NCERT Solutions for Class 10 Maths Chapter 14 Statistics — Exercise 14.1 (All 9 Questions)

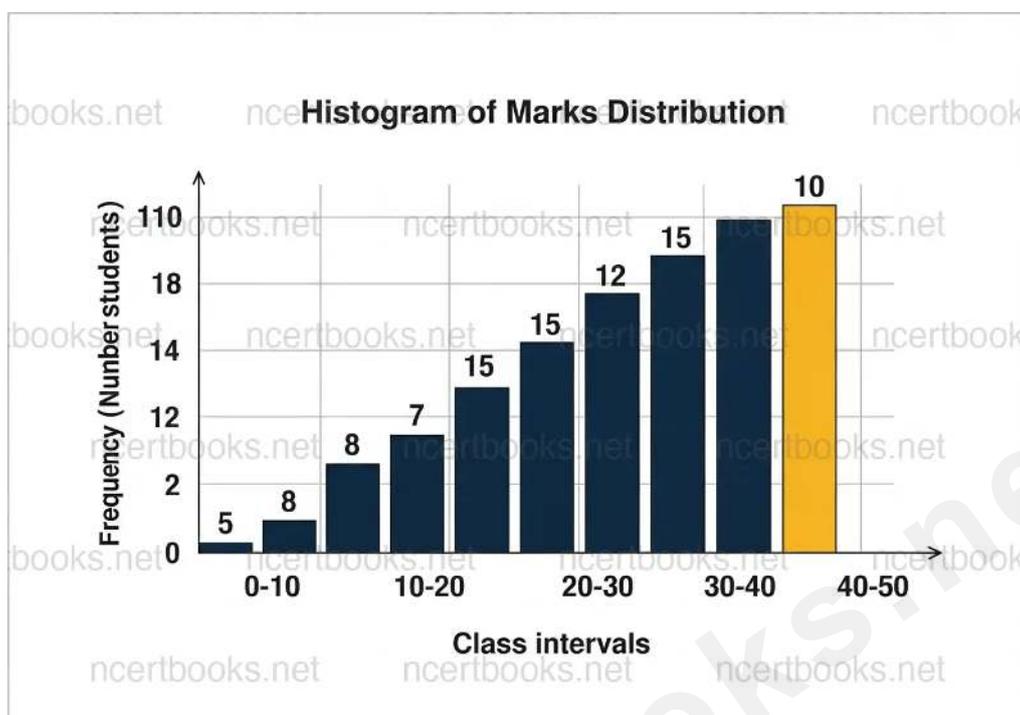


Fig 14.1: Histogram — bars represent frequency of each class interval

Question 1

Easy

A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house. Which method did you use for finding the mean, and why?

Data: Number of plants: 0–2 (freq 1), 2–4 (freq 2), 4–6 (freq 1), 6–8 (freq 5), 8–10 (freq 6), 10–12 (freq 2), 12–14 (freq 3). Total: 20 houses.

Key Concept: Since the class marks x_i are small numbers (1, 3, 5, 7, 9, 11, 13), the Direct Method is most convenient here.

Step 1: Find the class mark x_i for each interval: $x_i = (\text{lower} + \text{upper})/2$

0–2 $\rightarrow x_i = 1$; 2–4 $\rightarrow x_i = 3$; 4–6 $\rightarrow x_i = 5$; 6–8 $\rightarrow x_i = 7$; 8–10 $\rightarrow x_i = 9$; 10–12 $\rightarrow x_i = 11$; 12–14 $\rightarrow x_i = 13$

Step 2: Calculate $f_i x_i$ for each class:

Class $f_i x_i f_i x_i$

0–2	1	1	1
2–4	2	3	6
4–6	1	5	5
6–8	5	7	35
8–10	6	9	54
10–12	2	11	22
12–14	3	13	39
Total	20		162

Step 3: Apply the Direct Method formula:

$$\bar{x} = (\sum f_i x_i) / (\sum f_i) = 162/20 = 8.1$$

Why Direct Method? The class marks are small single-digit numbers, so multiplying $f_i \times x_i$ is straightforward. No need for the assumed mean or step deviation method.

∴ Mean number of plants per house = 8.1

Method used: Direct Method, because the class marks (x_i) are small numbers, making direct calculation simple and error-free.

Board Exam Note: This question asks you to justify your method choice — always write the reason in 1–2 sentences for full marks.

Question 2

Medium

Consider the following distribution of daily wages of 50 workers of a factory. Find the mean daily wages of the workers of the factory by using an appropriate method.

Data: 100–120 (freq 12), 120–140 (freq 14), 140–160 (freq 8), 160–180 (freq 6), 180–200 (freq 10). Total: 50 workers.

Key Concept: The class marks are large (110, 130, 150, 170, 190), so the **Assumed Mean Method** is appropriate. Choose $A = 150$ (middle class mark).

Step 1: Find class marks and deviations $d_i = x_i - A$ where $A = 150$:

Class	f_i	x_i	$d_i = x_i - 150$	$f_i d_i$
100–120	12	110	-40	-480
120–140	14	130	-20	-280

Class	f_i	x_i	$d_i = x_i - 150$	$f_i d_i$
140–160	8	150	0	0
160–180	6	170	20	120
180–200	10	190	40	400
Total	50			-240

Step 2: Apply the Assumed Mean Method formula:

$$\bar{x} = A + (\sum f_i d_i) / (\sum f_i) = 150 + (-240) / (50) = 150 - 4.8 = 145.20$$

∴ **Mean daily wages = ₹ 145.20**

Board Exam Note: Show your assumed mean choice clearly. Negative $\sum f_i d_i$ values are common — handle the sign carefully.

Question 3

Medium

The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is ₹ 18. Find the missing frequency f .

Data: 11–13 (freq 7), 13–15 (freq 6), 15–17 (freq 9), 17–19 (freq 13), 19–21 (freq f), 21–23 (freq 5), 23–25 (freq 4). Total frequency = $44 + f$. Mean = 18.

Key Concept: When the mean is given and a frequency is missing, set up the Direct Method formula, substitute the known mean, and solve for f .

Step 1: Find class marks: 12, 14, 16, 18, 20, 22, 24.

Step 2: Calculate $f_i x_i$:

Class	f_i	x_i	$f_i x_i$
11–13	7	12	84
13–15	6	14	84
15–17	9	16	144
17–19	13	18	234
19–21	f	20	$20f$
21–23	5	22	110
23–25	4	24	96
Total	$44 + f$		$752 + 20f$

Step 3: Use the mean formula and substitute $\bar{x} = 18$:

$$18 = (752 + 20f)/(44 + f)$$

Step 4: Cross-multiply and solve:

$$18(44 + f) = 752 + 20f$$

$$792 + 18f = 752 + 20f$$

$$792 - 752 = 20f - 18f$$

$$40 = 2f$$

$$f = 20$$

∴ **The missing frequency $f = 20$**

Board Exam Note: Missing frequency questions are very common in board exams. Always write the equation clearly before solving — examiners award method marks.

Question 4

Medium

Thirty women were examined in a hospital by a doctor and the number of heart beats per minute were recorded and summarised as follows. Find the mean heart beats per minute for these women, choosing a suitable method.

Data: 65–68 (freq 2), 68–71 (freq 4), 71–74 (freq 3), 74–77 (freq 8), 77–80 (freq 7), 80–83 (freq 4), 83–86 (freq 2). Total: 30 women.

Key Concept: The class size $h = 3$ is equal for all intervals and class marks are moderately large, so the **Step Deviation Method** is most suitable. Choose $A = 75.5$ (middle class mark).

Step 1: Find class marks: 66.5, 69.5, 72.5, 75.5, 78.5, 81.5, 84.5.

Step 2: Calculate step deviations $u_i = (x_i - 75.5)/(3)$:

Class f_i x_i $u_i = (x_i - 75.5)/(3)$ $f_i u_i$

65–68 2 66.5 -3 -6

68–71 4 69.5 -2 -8

71–74 3 72.5 -1 -3

74–77 8 75.5 0 0

77–80 7 78.5 1 7

80–83 4 81.5 2 8

83–86 2 84.5 3 6

Method used: Step Deviation Method, because the class marks are large numbers and the class size is uniform ($h = 2$), making step deviations simple integers.

Board Exam Note: This question explicitly asks which method you chose — write a one-line justification as shown above.

Question 6

Medium

The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure on food by a suitable method.

Data: 100–150 (freq 4), 150–200 (freq 5), 200–250 (freq 12), 250–300 (freq 2), 300–350 (freq 2). Total: 25 households.

Key Concept: Class marks are large (125, 175, 225, 275, 325) and class size $h = 50$ is uniform. Use the **Step Deviation Method** with $A = 225$.

Step 1: Calculate $u_i = (x_i - 225)/(50)$:

Class	f_i	x_i	$u_i = (x_i - 225)/(50)$	$f_i u_i$
100–150	4	125	-2	-8
150–200	5	175	-1	-5
200–250	12	225	0	0
250–300	2	275	1	2
300–350	2	325	2	4
Total	25			-7

Step 2: Apply the Step Deviation Method formula:

$$\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h = 225 + (-7/25) \times 50 = 225 - 14 = 211$$

∴ Mean daily expenditure on food = ₹ 211

Board Exam Note: A negative $\sum f_i u_i$ means the mean lies below the assumed mean — this is perfectly valid. Double-check your sign.

Question 7

Easy

To find out the concentration of SO₂ in the air (in parts per million, i.e. ppm), the data was collected for 30 localities in a certain city and is presented below. Find the mean concentration of SO₂ in the air.

Data: 0.00–0.04 (freq 4), 0.04–0.08 (freq 9), 0.08–0.12 (freq 9), 0.12–0.16 (freq 2), 0.16–0.20 (freq 4), 0.20–0.24 (freq 2). Total: 30 localities.

Key Concept: The class marks are small decimal values, so the **Direct Method** works well here.

Step 1: Find class marks: 0.02, 0.06, 0.10, 0.14, 0.18, 0.22.

Step 2: Calculate $f_i x_i$:

Class (ppm)	f_i	x_i	$f_i x_i$
0.00–0.04	4	0.02	0.08
0.04–0.08	9	0.06	0.54
0.08–0.12	9	0.10	0.90
0.12–0.16	2	0.14	0.28
0.16–0.20	4	0.18	0.72
0.20–0.24	2	0.22	0.44
Total	30		2.96

$$\bar{x} = (\Sigma f_i x_i) / (\Sigma f_i) = (2.96) / (30) = 0.0987 \approx 0.099 \text{ ppm}$$

∴ **Mean concentration of SO₂ = 0.099 ppm (approximately)**

Board Exam Note: Keep decimal calculations neat. Round only at the final step, not in intermediate calculations.

Question 8

Medium

A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent.

Data: 0–6 (freq 11), 6–10 (freq 10), 10–14 (freq 7), 14–20 (freq 4), 20–28 (freq 4), 28–38 (freq 3), 38–40 (freq 1). Total: 40 students.

Key Concept: The class sizes are unequal (6, 4, 4, 6, 8, 10, 2), so the **Direct Method** must be used. The Step Deviation Method requires equal class sizes.

Step 1: Find class marks: $x_i = 3, 8, 12, 17, 24, 33, 39$.

Step 2: Calculate $f_i x_i$:

Class f_i x_i $f_i x_i$

0–6 11 3 33

6–10 10 8 80

10–14 7 12 84

14–20 4 17 68

20–28 4 24 96

28–38 3 33 99

38–40 1 39 39

Total 40 499

$$\bar{x} = (\Sigma f_i x_i) / (\Sigma f_i) = 499/40 = 12.475 \approx 12.48 \text{ days}$$

∴ Mean number of days a student was absent \approx 12.48 days

Board Exam Note: When class sizes are unequal, always use the Direct Method.

Mentioning this reason in your answer can earn you an extra mark.

Question 9

Medium

The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate.

Data: 45–55 (freq 3), 55–65 (freq 10), 65–75 (freq 11), 75–85 (freq 8), 85–95 (freq 3).

Total: 35 cities.

Key Concept: Class marks are moderately large (50, 60, 70, 80, 90) and class size $h = 10$ is uniform. The **Step Deviation Method** is most efficient. Choose $A = 70$.

Step 1: Calculate $u_i = (x_i - 70)/(10)$:

Class (%) f_i x_i $u_i = (x_i - 70)/(10)$ $f_i u_i$

45–55 3 50 -2 -6

55–65 10 60 -1 -10

65–75 11 70 0 0

75–85 8 80 1 8

85–95 3 90 2 6

Total 35 -2

$$\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h = 70 + -2/35 \times 10 = 70 - 20/35 = 70 - 4/7 \approx 70 - 0.571 = 69.43\%$$

∴ Mean literacy rate ≈ 69.43%

Board Exam Note: Express the final answer as a percentage with 2 decimal places. Show the fraction form 4/7 before converting to decimal for full method marks.

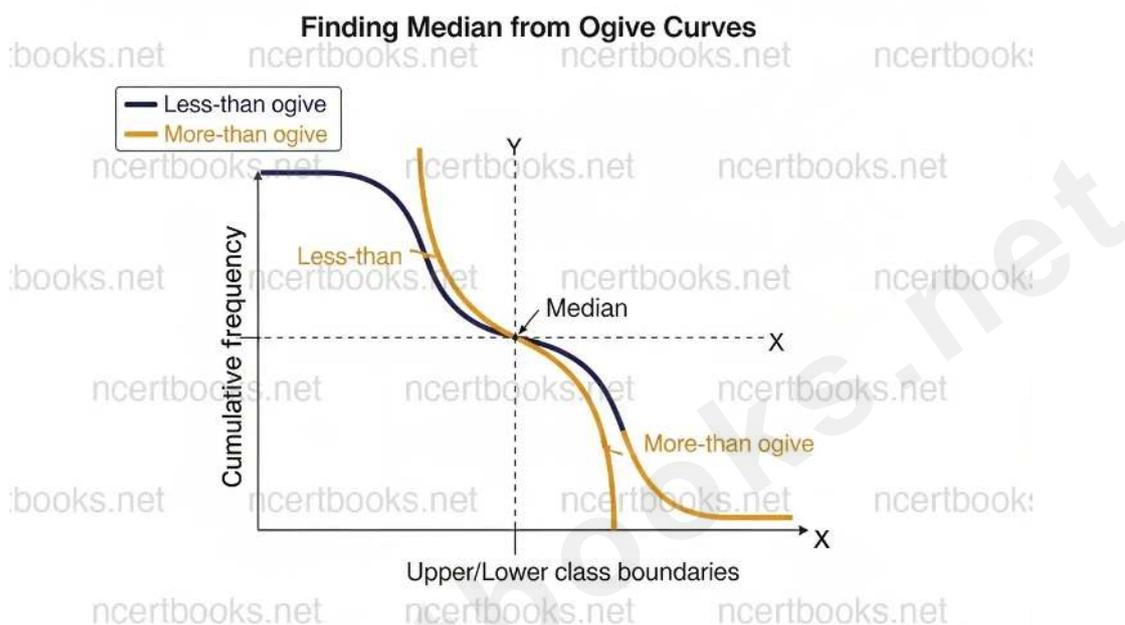


Fig 14.2: Finding median from intersection of less-than and more-than ogive curves

Formula Reference Table — Statistics Class 10

Formula Name	Formula	Variables Defined	When to Use
Class Mark	$x_i = (\text{Lower} + \text{Upper}) / (2)$	Midpoint of class interval	Always — first step
Direct Method	$\bar{x} = (\sum f_i x_i) / (\sum f_i)$	f_i = frequency, x_i = class mark	Small class marks or unequal class sizes
Assumed Mean Method	$\bar{x} = A + (\sum f_i d_i) / (\sum f_i)$	A = assumed mean, $d_i = x_i - A$	Large class marks, equal or unequal class sizes
Step Deviation Method	$\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h$	$u_i = (x_i - A) / (h)$, h = class size	Large class marks AND equal class sizes
Empirical Relation	$3 \times \text{Median} = \text{Mode} + 2 \times \text{Mean}$	Connects all three measures of central tendency	When one measure is unknown

Important Questions for CBSE Board Exam — Statistics Class 10

1-Mark Questions

- **Q:** What is the class mark of the interval 20–30? **A:** $x_i = (20+30)/(2) = 25$
- **Q:** Write the formula for mean using the Step Deviation Method. **A:** $\bar{x} = A + (\sum f_i u_i)/(\sum f_i) \times h$
- **Q:** State the empirical relationship between mean, median, and mode. **A:** $3 \times \text{Median} = \text{Mode} + 2 \times \text{Mean}$

3-Mark Questions

Q: The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Find the missing frequencies f_1 and f_2 .

Approach: Set up two equations — one from $\sum f_i = 50$ and one from the mean formula. Solve the simultaneous equations. Always show both equations clearly.

Q: Find the mean of the following data using the Assumed Mean Method: 0–10 (5), 10–20 (10), 20–30 (25), 30–40 (30), 40–50 (10).

Approach: Choose $A = 25$, calculate d_i , find $\sum f_i d_i = -200$, $\sum f_i = 80$. Mean = $25 + (-200)/(80) = 25 - 2.5 = 22.5$.

5-Mark Question

Q: The following distribution gives the daily income of 50 workers of a factory. Convert the distribution to a less-than ogive and find the median graphically.

Approach: First find cumulative frequencies. Plot points (upper class limit, cumulative frequency). Draw a smooth curve. Locate $n/2 = 25$ on the y-axis, draw a horizontal line to the curve, then drop a vertical to the x-axis — that value is the median. This type of question is worth full marks if the graph is neat and correctly labelled.

Common Mistakes Students Make in Statistics Class 10

Mistake 1: Using the class limit instead of the class mark in the formula.

Why it's wrong: The formula $\bar{x} = (\sum f_i x_i)/(\sum f_i)$ requires the midpoint x_i of each class, not the lower or upper boundary.

Correct approach: Always compute $x_i = (\text{Lower} + \text{Upper})/(2)$ first before filling the table.

Mistake 2: Using the Step Deviation Method when class sizes are unequal.

Why it's wrong: The step deviation $u_i = (x_i - A)/h$ only gives integers when h is uniform. Unequal class sizes produce messy fractions and wrong answers.

Correct approach: For unequal class sizes (like Question 8), always use the Direct Method.

Mistake 3: Forgetting the negative sign in $\sum f_i d_i$ or $\sum f_i u_i$.

Why it's wrong: If the assumed mean is above most class marks, the sum will be negative. Dropping the sign gives a wrong (inflated) mean.

Correct approach: Keep a separate column for signs. Add positive and negative $f_i d_i$ values separately, then subtract.

Mistake 4: Not justifying the method chosen when the question asks for it.

Why it's wrong: Questions 1 and 5 explicitly ask "which method did you use and why?" — skipping this costs you 1 mark.

Correct approach: Write one sentence: e.g., "I used the Direct Method because the class marks are small numbers, making direct multiplication simple."

Mistake 5: Rounding intermediate values instead of only the final answer.

Why it's wrong: Rounding $f_i x_i$ values mid-calculation introduces cumulative error and changes the final answer.

Correct approach: Carry all decimal places through the calculation and round only the final mean value to 2 decimal places.

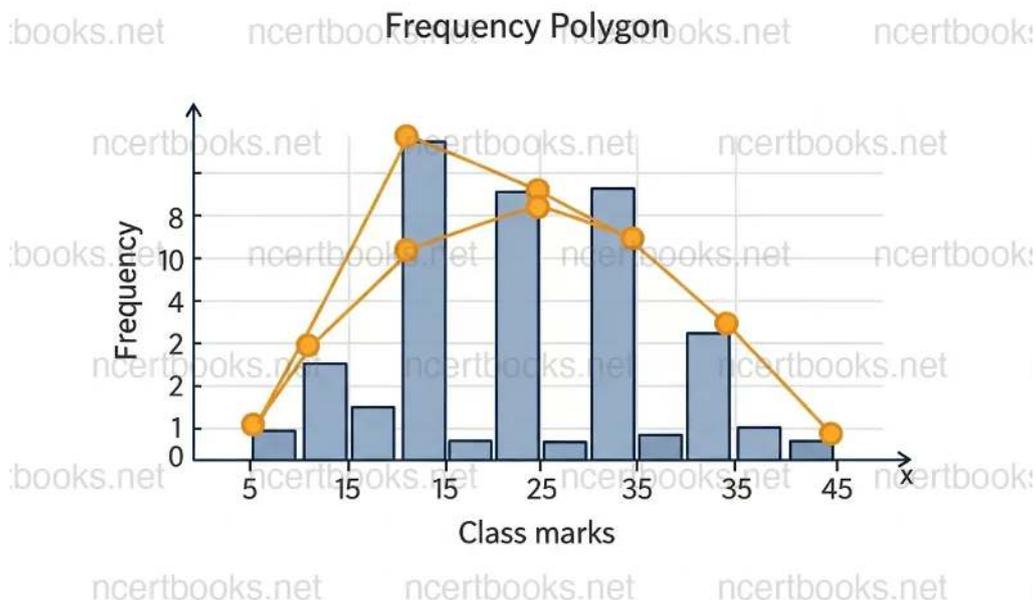


Fig 14.3: Frequency polygon — connect midpoints of histogram bar tops

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

CBSE 2026-27 Exam Tips — Statistics

- **Method Justification:** Whenever a question says "choose a suitable method" or "which method did you use?", always write a one-line reason. The CBSE marking scheme awards 1 mark for this justification.
- **Show All Steps:** Even if you can solve the problem mentally, write every step — x_i calculation, the full table, $\sum f_i x_i$, and the final formula. Step-by-step working is mandatory for 2-3 mark questions.
- **Table Format:** Draw a neat frequency distribution table with clearly labelled columns (f_i , x_i , d_i or u_i , $f_i x_i$ etc.). Examiners follow the table row by row — a messy table loses marks.
- **Check $\sum f_i$:** Always verify that your sum of frequencies equals the total given in the question (e.g., 50 workers, 30 women). A mismatch means a calculation error.
- **Missing Frequency Questions:** Set up the mean equation first, substitute the given mean, and solve algebraically. This type appears frequently in board papers and is fully solvable if you follow the method correctly.
- **Weightage:** Statistics carries approximately 6–11 marks in the CBSE Class 10 Maths board exam 2026-27. Mastering Exercise 14.1 (mean) and Exercise 14.2 (mode) and Exercise 14.3 (median) gives you a reliable scoring block.

For more solved exercises from Class 10 Maths, check our [NCERT Solutions for Class 10](#) hub, which covers all 15 chapters with step-by-step answers.

Frequently Asked Questions — NCERT Solutions Class 10 Maths Chapter 14 Statistics

Which method is best for finding mean of grouped data in Class 10 Statistics?

Use the **Direct Method** when class marks are small or class sizes are unequal. Use the **Assumed Mean Method** when class marks are large. Use the **Step Deviation Method** when class marks are large AND all class sizes are equal — it gives the simplest arithmetic. CBSE board exams accept any correct method as long as you show full working and justify your choice when asked.

How do I find a missing frequency when the mean is given in Class 10 Maths?

Write out the frequency table with the unknown frequency as f . Calculate $\sum f_i x_i$ in terms of f and $\sum f_i$ in terms of f . Substitute both into the mean formula $\bar{x} = (\sum f_i x_i) / (\sum f_i)$, plug in the given mean value, and solve the resulting linear equation. See Question 3 above for a complete worked example.

How many questions are in NCERT Class 10 Maths Chapter 14 Exercise 14.1?

Exercise 14.1 of Class 10 Maths Chapter 14 Statistics contains **9 questions**. All 9 questions focus on finding the mean of grouped data. They cover all three methods — Direct Method, Assumed Mean Method, and Step Deviation Method — and one question (Q3) involves finding a missing frequency when the mean is given. All 9 solutions are provided above with full working.

What is the step deviation method formula for mean in Statistics Class 10?

The Step Deviation Method formula is $\bar{x} = A + (\sum f_i u_i) / (\sum f_i) \times h$, where A is the assumed mean (chosen as the middle class mark), $u_i = (x_i - A) / (h)$ is the step deviation for each class, h is the uniform class size, and f_i is the frequency. This method is valid only when all class intervals have the same width.

Is Chapter 14 Statistics important for CBSE Class 10 board exam 2026-27?

Yes, Statistics is one of the most reliable scoring chapters in Class 10 Maths for the 2026-27 CBSE board exam. It typically carries 6 to 11 marks. Questions on mean (Ex 14.1), mode (Ex 14.2), and median (Ex 14.3) appear every year. The ogive (cumulative frequency graph) from Ex 14.4 is also commonly tested. Practising all exercises thoroughly gives you a strong advantage in the board exam.

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