CLASS 10 · MATHEMATICS · CHAPTER 13

Statistics - NCERT Examples

Examples 1-8 with independently verified solutions.

CHAPTER	RESOURCE	SOURCE
Statistics	NCERT Examples	NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

mean · ungrouped frequency distribution · direct method

The marks obtained by 30 Class X students in a 100-mark Mathematics paper are given below. Find the mean marks.

Marks obtained by 30 students

Marks obtained	Number of students
10	1
20	1
36	3
40	4
50	3
56	2
60	4
70	4
72	1
80	1
88	2
92	3
95	1

Solution

Board-exam working:

Multiply every observation by its corresponding frequency.

Direct-method calculation

Marks (x_i)	Frequency (f_i)	$f_i x_i$
10	1	10
20	1	20
36	3	108
40	4	160
50	3	150
56	2	112
60	4	240
70	4	280
72	1	72
80	1	80
88	2	176
92	3	276
95	1	95

$$\sum f_i = 30, \qquad \sum f_i x_i = 1779$$

$$\bar{x} = \frac{\sum f_i x_i}{\sum f_i} = \frac{1779}{30} = 59.3$$

Final answer

$$\boxed{\bar{x} = 59.3 \text{ marks}}$$

NCERT EXAMPLE

Example 2

mean · grouped data · direct assumed mean step deviation

The percentage distribution of female teachers in primary schools of rural areas of various States and Union Territories is given below. Find the mean percentage by the direct, assumed-mean and step-deviation methods.

Female teachers (%)	States/U.T. (f_i)
15–25	6
25–35	11
35–45	7
45–55	4
55–65	4
65–75	2
75–85	1

Solution

Board-exam working:

The class marks are the midpoints of the intervals. Take the assumed mean as 50 and class size as 10.

Class marks and deviations (a = 50, h = 10)

Class	f_i	x_i	d_i	u_i
15–25	6	20	−30	−3
25–35	11	30	−20	−2
35–45	7	40	−10	−1
45–55	4	50	0	0
55–65	4	60	10	1
65–75	2	70	20	2
75–85	1	80	30	3

Products used by the three methods

Class	f_ix_i	f_id_i	f_iu_i
15–25	120	−180	−18
25–35	330	−220	−22
35–45	280	−70	−7
45–55	200	0	0
55–65	240	40	4
65–75	140	40	4
75–85	80	30	3

$$\sum f_i = 35, \quad \sum f_i x_i = 1390, \quad \sum f_i d_i = -360, \quad \sum f_i u_i = -36$$

Direct method:

$$\bar{x} = \frac{1390}{35} = 39.714\ldots$$

Assumed-mean method:

$$\bar{x} = 50 + \frac{-360}{35} = 39.714\ldots$$

Step-deviation method:

$$\bar{x} = 50 + 10\left(\frac{-36}{35}\right) = 39.714\ldots$$

Final answer

$$\boxed{\bar{x} \approx 39.71\%}$$

NCERT EXAMPLE

Example 3

mean · unequal class intervals · step deviation

The distribution below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean and state what it signifies.

Wickets	Bowlers (f_i)
20–60	7
60–100	5
100–150	16
150–250	12
250–350	2
350–450	3

Solution

Board-exam working:

The class sizes vary. Use class marks with assumed mean 200 and convenient divisor 20.

Class	f_i	x_i	$d_i = x_i - 200$	$u_i = d_i/20$	f_iu_i
20–60	7	40	−160	−8	−56
60–100	5	80	−120	−6	−30
100–150	16	125	−75	−3.75	−60
150–250	12	200	0	0	0
250–350	2	300	100	5	10
350–450	3	400	200	10	30

$$\sum f_i = 45, \qquad \sum f_i u_i = -106$$

$$\bar{x} = 200 + 20\left(\frac{-106}{45}\right)$$

$$= 200 - 47.111\ldots = 152.888\ldots$$

Thus these 45 bowlers took about 152.89 wickets on average.

Final answer

$$\boxed{\bar{x} \approx 152.89 \text{ wickets}}$$

NCERT EXAMPLE

Example 4

mode · ungrouped data

The wickets taken by a bowler in 10 cricket matches were 2, 6, 4, 5, 0, 2, 1, 3, 2 and 3. Find the mode.

Solution

Board-exam working:

Frequency distribution

Wickets	Number of matches
0	1
1	1
2	3
3	2
4	1
5	1
6	1

The observation with the greatest frequency is the mode.

$$f(2) = 3, \text{ which is the maximum frequency}$$

Final answer

$$\boxed{\text{Mode} = 2 \text{ wickets}}$$

NCERT EXAMPLE

Example 5

mode · grouped data · modal class

A survey of 20 households gave the following frequency table for family size. Find the mode.

Family size	Families
1–3	7
3–5	8
5–7	2
7–9	2
9–11	1

Solution

Board-exam working:

The highest frequency is 8, so the modal class is 3–5.

$$l = 3, \quad h = 2, \quad f_1 = 8, \quad f_0 = 7, \quad f_2 = 2$$

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

$$= 3 + \frac{8 - 7}{2(8) - 7 - 2} \times 2$$

$$= 3 + \frac{2}{7} = 3.2857\ldots$$

Final answer

$$\boxed{\text{Mode} \approx 3.286 \text{ members}}$$

NCERT EXAMPLE

Example 6

mode · mean comparison · grouped marks

For the grouped marks distribution below, find the mode and compare it with the mean.

Marks	Students
10–25	2
25–40	3
40–55	7
55–70	6
70–85	6
85–100	6

Solution

Board-exam working:

The maximum frequency is 7, so the modal class is 40–55.

$$l = 40, \quad h = 15, \quad f_1 = 7, \quad f_0 = 3, \quad f_2 = 6$$

$$\text{Mode} = 40 + \frac{7 - 3}{2(7) - 3 - 6} \times 15$$

$$= 40 + \frac{4}{5} \times 15 = 52$$

The mean of the same grouped data is 62. The greatest concentration is around 52 marks, while the arithmetic average is 62 marks.

Final answer

$$\boxed{\text{Mode} = 52 \text{ marks}; \quad \bar{x} = 62 \text{ marks}}$$

NCERT EXAMPLE

Example 7

median · less-than cumulative frequency · heights

The following less-than cumulative-frequency distribution gives the heights of 51 Class X girls. Find the median height.

Height (cm)	Girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

Solution

Board-exam working:

Subtract successive cumulative frequencies to obtain class frequencies.

Class	Frequency	Cumulative frequency
Below 140	4	4
140–145	7	11
145–150	18	29
150–155	11	40
155–160	6	46
160–165	5	51

$$n = 51, \qquad \frac{n}{2} = 25.5$$

The first cumulative frequency greater than 25.5 is 29, so the median class is 145–150.

$$l = 145, \quad cf = 11, \quad f = 18, \quad h = 5$$

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

$$= 145 + \frac{25.5 - 11}{18} \times 5$$

$$= 145 + \frac{72.5}{18} = 149.027\ldots$$

Final answer

$$\boxed{\text{Median height} \approx 149.03 \text{ cm}}$$

NCERT EXAMPLE

Example 8

median · missing frequencies

The median of the following distribution is 525 and the total frequency is 100. Find x and y.

Class	Frequency
0–100	2
100–200	5
200–300	x
300–400	12
400–500	17
500–600	20
600–700	y
700–800	9
800–900	7
900–1000	4

Solution

Board-exam working:

Using the total frequency:

$$2 + 5 + x + 12 + 17 + 20 + y + 9 + 7 + 4 = 100$$

$$x + y = 24 \qquad (1)$$

Since 525 lies in 500–600, that is the median class.

$$l = 500, \quad f = 20, \quad cf = 36 + x, \quad h = 100, \quad \frac{n}{2} = 50$$

$$525 = 500 + \frac{50 - (36 + x)}{20} \times 100$$

$$25 = 5(14 - x) = 70 - 5x$$

$$5x = 45 \Rightarrow x = 9$$

Substitute in equation (1).

$$9 + y = 24 \Rightarrow y = 15$$

Final answer

$$\boxed{x = 9, \qquad y = 15}$$