CLASS 10 · MATHEMATICS · CHAPTER 13

# Statistics - Exercise 13.1

Exercise 13.1 with independently verified solutions.

| CHAPTER | RESOURCE | SOURCE |
| --- | --- | --- |
| Statistics | NCERT Exercises | 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.

QUESTION

## Question 1

mean plants · direct method

A survey recorded the number of plants in 20 houses. Find the mean number of plants per house and state a suitable method.

| Plants | Houses ($f_i$) |
| --- | --- |
| 0–2 | 1 |
| 2–4 | 2 |
| 4–6 | 1 |
| 6–8 | 5 |
| 8–10 | 6 |
| 10–12 | 2 |
| 12–14 | 3 |

## Solution

Board-exam working:

The class marks and frequencies are small, so use the direct method.

| 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 |

$$\sum f_i = 20, \qquad \sum f_i x_i = 162$$

$$\bar{x} = \frac{162}{20} = 8.1$$

## Final answer

$$\boxed{\bar{x} = 8.1 \text{ plants per house}}$$

QUESTION

# Question 2

mean wages · assumed mean

The daily wages of 50 factory workers are distributed as follows. Find the mean daily wage using an appropriate method.

| Daily wages (₹) | Workers ($f_i$) |
|---|---|
| 500–520 | 12 |
| 520–540 | 14 |
| 540–560 | 8 |
| 560–580 | 6 |
| 580–600 | 10 |

## Solution

Board-exam working:

Take assumed mean 550 and class size 20.

| Class | $f_i$ | $x_i$ | $u_i = (x_i - 550)/20$ | $f_i u_i$ |
|---|---|---|---|---|
| 500–520 | 12 | 510 | −2 | −24 |
| 520–540 | 14 | 530 | −1 | −14 |
| 540–560 | 8 | 550 | 0 | 0 |
| 560–580 | 6 | 570 | 1 | 6 |
| 580–600 | 10 | 590 | 2 | 20 |

$$\sum f_i = 50, \qquad \sum f_i u_i = -12$$

$$\bar{x} = 550 + 20\left(\frac{-12}{50}\right)$$

$$= 550 - 4.8 = 545.2$$

## Final answer

$$\boxed{\text{Mean daily wage} = \text{Rs. } 545.20}$$

QUESTION

# Question 3

mean · missing frequency · pocket allowance

The mean daily pocket allowance is ₹18. Find the missing frequency f.

| Allowance (₹) | Children |
|---|---|
| 11–13 | 7 |
| 13–15 | 6 |
| 15–17 | 9 |
| 17–19 | 13 |
| 19–21 | f |
| 21–23 | 5 |
| 23–25 | 4 |

## Solution

Board-exam working:

| Class mark ($x_i$) | Frequency ($f_i$) | $f_i x_i$ |
|---|---|---|
| 12 | 7 | 84 |
| 14 | 6 | 84 |
| 16 | 9 | 144 |
| 18 | 13 | 234 |
| 20 | f | 20f |
| 22 | 5 | 110 |
| 24 | 4 | 96 |

$$\sum f_i = 44 + f, \qquad \sum f_i x_i = 752 + 20f$$

Use the given mean.

$$18 = \frac{752 + 20f}{44 + f}$$

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

$$40 = 2f \Rightarrow f = 20$$

## Final answer

$$\boxed{f = 20}$$

QUESTION

# Question 4

mean heartbeats · step deviation

Thirty women were examined in a hospital. Find their mean heartbeats per minute from the distribution below.

| Heartbeats/min | Women |
|---|---|
| 65–68 | 2 |
| 68–71 | 4 |
| 71–74 | 3 |
| 74–77 | 8 |
| 77–80 | 7 |
| 80–83 | 4 |
| 83–86 | 2 |

## Solution

Board-exam working:

Take assumed mean 75.5 and class size 3.

| Class | $f_i$ | $x_i$ | $u_i$ | $f_iu_i$ |
|---|---|---|---|---|
| 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 |

$$\sum f_i = 30, \qquad \sum f_i u_i = 4$$

$$\bar{x} = 75.5 + 3\left(\frac{4}{30}\right) = 75.9$$

## Final answer

$$\boxed{\bar{x} = 75.9 \text{ heartbeats per minute}}$$

QUESTION

# Question 5

mean mangoes · step deviation

Packing boxes contain varying numbers of mangoes. Find the mean number of mangoes per box and state a suitable method.

| Mangoes | Boxes |
|---|---|
| 50–52 | 15 |
| 53–55 | 110 |
| 56–58 | 135 |
| 59–61 | 115 |
| 62–64 | 25 |

## Solution

Board-exam working:

The inclusive classes have class marks 51, 54, 57, 60 and 63. Take assumed mean 57 and step 3.

| Class | $f_i$ | $x_i$ | $u_i$ | $f_iu_i$ |
|---|---|---|---|---|
| 50–52 | 15 | 51 | −2 | −30 |
| 53–55 | 110 | 54 | −1 | −110 |
| 56–58 | 135 | 57 | 0 | 0 |
| 59–61 | 115 | 60 | 1 | 115 |
| 62–64 | 25 | 63 | 2 | 50 |

$$\sum f_i = 400, \qquad \sum f_i u_i = 25$$

$$\bar{x} = 57 + 3\left(\frac{25}{400}\right)$$

$$= 57 + 0.1875 = 57.1875$$

### Final answer

$$\boxed{\bar{x} \approx 57.19 \text{ mangoes per box}}$$

QUESTION

## Question 6

mean expenditure · direct method

The table shows the daily food expenditure of 25 households. Find the mean daily expenditure.

| Expenditure (₹) | Households |
|---|---|
| 100–150 | 4 |
| 150–200 | 5 |
| 200–250 | 12 |
| 250–300 | 2 |
| 300–350 | 2 |

## Solution

Board-exam working:

| Class | $f_i$ | $x_i$ | $f_i x_i$ |
|---|---|---|---|
| 100–150 | 4 | 125 | 500 |
| 150–200 | 5 | 175 | 875 |
| 200–250 | 12 | 225 | 2700 |
| 250–300 | 2 | 275 | 550 |
| 300–350 | 2 | 325 | 650 |

$$\sum f_i = 25, \qquad \sum f_i x_i = 5275$$

$$\bar{x} = \frac{5275}{25} = 211$$

## Final answer

$$\boxed{\text{Mean daily expenditure} = \text{Rs. } 211}$$

QUESTION

# Question 7

mean sulphur dioxide · ppm

The concentration of sulphur dioxide in the air was measured in 30 localities. Find the mean concentration.

| $SO_2$ concentration (ppm) | Frequency |
|---|---|
| 0.00–0.04 | 4 |
| 0.04–0.08 | 9 |
| 0.08–0.12 | 9 |
| 0.12–0.16 | 2 |
| 0.16–0.20 | 4 |
| 0.20–0.24 | 2 |

## Solution

Board-exam working:

| Class | $f_i$ | $x_i$ | $f_i x_i$ |
|---|---|---|---|
| 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 |

$$\sum f_i = 30, \qquad \sum f_i x_i = 2.96$$

$$\bar{x} = \frac{2.96}{30} = 0.098666\ldots$$

### Final answer

$$\boxed{\bar{x} \approx 0.099 \text{ ppm}}$$

QUESTION

## Question 8

mean absence · unequal intervals

The absentee record of 40 students for a term is given below. Find the mean number of days absent.

| Days absent | Students |
|---|---|
| 0–6 | 11 |
| 6–10 | 10 |
| 10–14 | 7 |
| 14–20 | 4 |
| 20–28 | 4 |
| 28–38 | 3 |
| 38–40 | 1 |

## Solution

Board-exam working:

**Since the class widths differ, use the direct method with class marks.**

| 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 |

$$\sum f_i = 40, \qquad \sum f_i x_i = 499$$

$$\bar{x} = \frac{499}{40} = 12.475$$

## Final answer

$$\boxed{\bar{x} \approx 12.48 \text{ days}}$$

QUESTION

# Question 9

mean literacy rate · direct method

The literacy rates of 35 cities are grouped below. Find the mean literacy rate.

| Literacy rate (%) | Cities |
|---|---|
| 45–55 | 3 |
| 55–65 | 10 |
| 65–75 | 11 |
| 75–85 | 8 |
| 85–95 | 3 |

## Solution

Board-exam working:

| Class | $f_i$ | $x_i$ | $f_i x_i$ |
|---|---|---|---|
| 45–55 | 3 | 50 | 150 |
| 55–65 | 10 | 60 | 600 |
| 65–75 | 11 | 70 | 770 |
| 75–85 | 8 | 80 | 640 |
| 85–95 | 3 | 90 | 270 |

$$\sum f_i = 35, \qquad \sum f_i x_i = 2430$$

$$\bar{x} = \frac{2430}{35} = 69.4285\ldots$$

## Final answer

$$\boxed{\bar{x} \approx 69.43\%}$$