

RD Sharma
Solutions

Class 7

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Chapter-23
Data handling
(Central values)

Exercise 23.1

Q.1 Ashish studies for 4 hours, 5 hours and 3 hours on three consecutive days. How many hours does he study daily on an average?

Solution:

$$\text{Average study} = \frac{4+5+3}{3} = \frac{12}{3} = 4 \text{ hours.}$$

Q.2 A cricketer scores the following runs in 8

Innings : 58, 76, 40, 35, 48, 45, 0, 100. Find the mean score.

Solution: Mean Score =
$$\frac{58+76+40+35+48+45+0+100}{8}$$

$$= \frac{402}{8} = 50.25 \text{ runs}$$

Q.3 The marks (out of 100) obtained by a group of students in Science test are 85, 76, 90, 84, 39, 48, 56, 95, 81, and 75. Find the

(i) highest and lowest marks obtained by the students.

(iv) range of marks obtained.

(iii) mean marks obtained by the group.

Solution: (i) highest marks = 95

lowest marks = 39

$$\begin{aligned}\text{(ii) range of marks} &= \text{highest marks} - \text{lowest marks} \\ &= 95 - 39 \\ &= 56 \text{ Marks.}\end{aligned}$$

$$\begin{aligned}\text{(iii) Mean marks} &= \frac{85 + 76 + 90 + 84 + 39 + 48 + 56 + 95 + 81 + 75}{10} \\ &= \frac{729}{10} = 72.9 \text{ Marks}\end{aligned}$$

Q.9 The enrolment of a school during six consecutive years was as follows:

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Rainfall (mm)	0.0	12.2	2.1	0.0	20.5	5.3	1.0

(i) Find the range of rainfall from above data.

(ii) Find mean rainfall for the week.

(iii) On how many days was the rainfall less than the mean rainfall.

Solution:

$$(i) \text{ Range of rainfall} = 20.5 - 0.0 \\ = 20.5 \text{ mm.}$$

$$(ii) \text{ Mean rainfall} = \frac{0.0 + 12.2 + 2.1 + 0.0 + 20.5 + 5.3 + 1.0}{7} \\ = \frac{41.1}{7} = 5.87 \text{ mm}$$

$$(iii) \text{ Rain fall less than mean rainfall} \\ = 0.0, 2.1, 0.0, 5.3, 1.0$$

$\therefore$ Total 5 days.

Q6 If the heights of 5 persons are 140cm, 150cm, 152cm, 158cm and 161cm. find the mean height.

Solution

$$\text{Mean height} = \frac{140 + 150 + 152 + 158 + 161}{5} = \frac{761}{5} \\ = 152.2 \text{ cm}$$

Q7 Find the mean of 994, 996, 998, 1002, and 1000.

Solution:

$$\text{Mean} = \frac{994 + 996 + 998 + 1002 + 1000}{5} = \frac{4990}{5} \\ = 998$$

Q.8 Find the mean of first five natural numbers.

Solution : $\text{Mean} = \frac{1+2+3+4+5}{5} = \frac{15}{5} = 3$

Q.9 Find the mean of all factors of 10.

Solution! Factors of 10 are, 1, 2, 5, 10

$$\text{Mean of factors} = \frac{1+2+5+10}{4} = \frac{18}{4} = 4.5$$

Q.10 Find The Mean of first 10 even natural numbers.

Solution! $\text{Mean} = \frac{2+4+6+8+10+12+14+16+18+20}{10}$

$$= \frac{110}{10} = 11$$

Q.11 , Find the mean of $x, x+2, x+4, x+6, x+8$.

Solution! $\text{Mean} = \frac{x+x+2+x+4+x+6+x+8}{5}$

$$= \frac{5x+20}{5} = \frac{5(x+4)}{5}$$

$$= (x+4)$$

Q.12 Find the mean of first five multiples of 3.

Solution: First five multiples of 3 are

3, 6, 9, 12, 15

$$\text{Mean} = \frac{3+6+9+12+15}{5} = \frac{45}{5} = 9$$

Q.13 Following are the weights (in kg) of 10 new born babies in a hospital on a particular day.

3.4, 3.6, 4.2, 4.5, 3.9, 4.1, 3.8, 4.5, 4.4, 3.6.

Find the mean $\bar{x}$.

Solution

$$\begin{aligned} \text{Mean} &= \frac{3.4 + 3.6 + 4.2 + 4.5 + 3.9 + 4.1 + 3.8 + 4.5 + 4.4 + 3.6}{10} \\ &= \frac{40}{10} = 4 \text{ kg} \end{aligned}$$

Q.14 The percentage of marks obtained by students of a class in mathematics are:

64, 36, 47, 23, 0, 19, 81, 93, 72, 35, 3, 1. Find their

Mean.

$$\begin{aligned} \text{Solution: Mean} &= \frac{64+36+47+23+0+19+81+93+72+35+3+1}{12} \\ &= \frac{474}{12} = 39.5 \end{aligned}$$

Q.15 The number of children in 10 families of a locality are:

2, 4, 3, 4, 2, 3, 5, 1, 1, 5. Find the mean number of children per family.

Solution!

$$\text{Mean children} = \frac{2+4+3+4+2+3+5+1+1+5}{10}$$

$$= \frac{30}{10} = 3$$

Q.16 The mean of marks scored by 100 students was found to be 40. Later on it was discovered that a score 53 was misread as 83. Find the correct mean.

Solution $\therefore \text{Mean} = \frac{\text{Sum of observations}}{\text{no. of observations}}$

$$\Rightarrow 40 = \frac{\text{Sum of observations}}{100}$$

$$\Rightarrow \text{Incorrect Sum} = 40 \times 100 = 4000$$

$$\therefore \text{Correct Sum} = \text{Incorrect Sum} - \text{Incorrect value} + \text{Correct value}$$

$$= 4000 - 83 + 53$$

$$= 3970$$

$$\text{Correct Mean} = \frac{3970}{100} = 39.7$$

Q.17 The mean of five numbers is 27. If one number is excluded, their mean is 25. Find the excluded number.

Solution: Sum of observation = Mean $\times$ no. of obs.

$$= 5 \times 27$$

$$= 135$$

Now one no. is excluded, Then Mean = 25

$$\text{New Sum} = 25 \times 4 = 100.$$

$$\therefore \text{excluded number} = 135 - 100 = 35.$$

Q.18 The mean weight per student in a group of 7 students is 55 kg. The individual weights of 6 of them (in kg) are 52, 54, 55, 53, 56 and 54. Find the weight of the seventh student.

Solution: $\therefore$ Mean weight of 7 students = 55 kg

$$\therefore \text{Sum of weights} = 7 \times 55 = 385 \text{ kg}$$

$$\begin{aligned} \text{Sum of weights of 6 students} &= 52 + 54 + 55 + 53 + 56 \\ &\quad + 54 \\ &= 324 \text{ kg.} \end{aligned}$$

$$\begin{aligned} \therefore \text{weight of seventh student} &= 385 \text{ kg} - 324 \text{ kg} \\ &= 61 \text{ kg} \end{aligned}$$

Q.19 The mean weight of 8 numbers is 15 kg.

If each number is multiplied by 2, what will be the new mean?

Solution: Let $x_1, x_2, x_3, \dots, x_8$ be 8 numbers.

Mean weight = 15 kg

$$\therefore 15 = \frac{x_1 + x_2 + x_3 + \dots + x_8}{8}$$

$$\Rightarrow x_1 + x_2 + \dots + x_8 = 120$$

New numbers are $2x_1, 2x_2, \dots, 2x_8$. Let M be their mean, then

$$M = \frac{2x_1 + 2x_2 + \dots + 2x_8}{8}$$

$$\Rightarrow M = \frac{2(x_1 + x_2 + \dots + x_8)}{8}$$

$$= \frac{2 \times 120}{8}$$

$$M = 30$$

$\therefore$ New mean = 30 kg

Q.20 The mean of 5 numbers is 18. If one no. is excluded, their mean is 16. Find the excluded number.

Solution: $\therefore$ Mean of 5 numbers = 18

$$\therefore \text{Sum of numbers} = 5 \times 18 = 90$$

If one number is excluded then new mean = 16

$$\text{Now, sum of numbers} = 4 \times 16 \\ = 64$$

$$\text{Therefore, excluded number} = 90 - 64 \\ = 26$$

Q.21 The mean of 200 items was 50. Later on it was discovered that two items were misread as 92 and 8 instead of 192 and 88. Find the correct mean.

Solution: $\therefore$ Mean of 200 items = 50

$$\therefore \text{Sum of values} = 200 \times 50 = 10000$$

$$\text{Therefore Incorrect Sum} = 10000$$

$$\text{Now Correct Sum} = \text{Incorrect Sum} - \text{Incorrect items} \\ + \text{Correct items}$$

$$= 10000 - (92 + 8) + (192 + 88)$$

$$= 10180$$

$$\therefore \text{Correct Mean} = \frac{10180}{200} = 50.9$$

Q.22 The mean of 5 numbers is 27. If one more number is included, then the mean is 25. Find the included number.

Solution: Mean of 5 numbers = 27

hence, Sum of numbers = $5 \times 27 = 135$.

If one number is included then new mean = 25

$\therefore$ New sum = $6 \times 25 = 150$

$\therefore$ Included number = $150 - 135 = 15$

Q.23 The mean of 75 numbers is 35. If each number is multiplied by 4. Find the new mean.

Solution: let mean of $x_1, x_2, x_3, \dots, x_{75} = 35$

$$35 = \frac{x_1 + x_2 + \dots + x_{75}}{75}$$

$$\Rightarrow x_1 + x_2 + \dots + x_{75} = 35 \times 75 = 2625$$

If each number multiplied by 4, then new mean is M

$$\begin{aligned} M &= \frac{4x_1 + 4x_2 + \dots + 4x_{75}}{75} = \frac{4(x_1 + x_2 + \dots + x_{75})}{75} \\ &= \frac{4 \times 2625}{75} = 140 \end{aligned}$$