

(Class – IX)

Exercise 14.4

Question 1:

The following number of goals was scored by a team in a series of 10 matches:

2, 3, 4, 5, 0, 1, 3, 3, 4, 3

Find the mean, median and mode of these scores.

Answer 1:

The number of goals scored by the team is

2, 3, 4, 5, 0, 1, 3, 3, 4, 3

Mean of data =
$$\frac{\text{Sum of all observations}}{\text{Total number of observations}}$$

Mean score =
$$\frac{2+3+4+5+0+1+3+3+4+3}{10}$$
$$= \frac{28}{10} = 2.8$$
$$= 2.8 \text{ goals}$$

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Arranging the number of goals in ascending order,

0, 1, 2, 3, 3, 3, 3, 4, 4, 5

The number of observations is 10, which is an even number. Therefore,

 $Median = \frac{5^{th}term + 6^{th}term}{2} = \frac{3+3}{2} = \frac{6}{2} = 3$

Mode of data is the observation with the maximum frequency in data.

Therefore, the mode score of data is 3 as it has the maximum frequency as 4 in the data.





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Question 2:

In a mathematics test given to 15 students, the following marks (out of 100) are recorded:

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

Find the mean, median and mode of this data.

Answer 2:

The marks of 15 students in mathematics test are

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

Mean of data = $\frac{\text{Sum of all observation}}{\text{Total number of observation}}$ $= \frac{41+39+48+52+46+62+54+40+96+52+98+40+42+52+60}{15}$ $= \frac{822}{15} = 54.8$

Arranging the scores obtained by 15 students in an ascending order,

39, 40, 40, 41, 42, 46, 48, 52, 52, 52, 54, 60, 62, 96, 98

As the number of observations is 15 which is odd, therefore, the median of data will

be $\frac{(15+1)^{th}}{2} = 8^{th}$ observation whether the data is arranged in an ascending or descending order.

Therefore, median score of data = 52

Mode of data is the observation with the maximum frequency in data. Therefore, mode of this data is 52 having the highest frequency in data as 3.





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Question 3:

The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x.

29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

Answer 3:

It can be observed that the total number of observations in the given data is 10 (even number). Therefore, the median of this data will be the mean of 10/2 i.e., 5^{th} and (10/2)+1 i.e., 6^{th} term.

Therefore, median of data = $\frac{5^{\text{th}} \text{ observation} + 6^{\text{th}} \text{ observation}}{2}$ $\Rightarrow 63 = \frac{x + x + 2}{2}$ $\Rightarrow 63 = \frac{2x + 2}{2}$ $\Rightarrow 63 = x + 1$ $\Rightarrow x = 62$

Question 4:

Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, and 18.

Answer 4:

Arranging the data in an ascending order,

14, 14, 14, 14, 17, 18, 18, 18, 22, 23, 25, 28

It can be observed that 14 has the highest frequency, i.e. 4, in the given data. Therefore, mode of the given data is 14.





Question 5:

Find the mean salary of 60 workers of a factory from the following table:

Salary (in Rs)	Number of workers
3000	16
4000	12
5000	10
6000	8
7000	6
8000	4
9000	3
1000	1
Total	60





Answer 5: Using the table, the mean can be calculated as follows.

Salary (in Rs) (x _i)	Number of workers (f _i)	fixi
3000	16	3000 × 16 = 48000
4000	12	4000 × 12 = 48000
5000	10	5000 × 10 = 50000
6000	8	6000 × 8 = 48000
7000	6	7000 × 6 = 42000
8000	4	8000 × 4 = 32000
9000	3	9000 × 3 = 27000
10000	1	10000 × 1 = 10000
Total	$\sum f_i = 60$	$\sum f_i x_i = 305000$

 $Mean = \frac{\sum f_i x_i}{\sum f_i}$

 $Mean \text{ salary} = \frac{305000}{60}$ = 5083.33

Therefore, mean salary of 60 workers is Rs 5083.33.



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Question 6:

Give one example of a situation in which

- (i) The mean is an appropriate measure of central tendency.
- (ii) The mean is not an appropriate measure of central tendency but the median is

an appropriate measure of central tendency.

Answer 6:

When any data has a few observations such that these are very far from the other observations in it, it is better to calculate the median than the mean of the data as median gives a better estimate of average in this case.

 (i) Consider the following example – the following data represents the heights of the members of a family.

154.9 cm, 162.8 cm, 170.6 cm, 158.8 cm, 163.3 cm, 166.8 cm, 160.2 cm

In this case, it can be observed that the observations in the given data are close to each other. Therefore, mean will be calculated as an appropriate measure of central tendency.

(ii) The following data represents the marks obtained by 12 students in a test.

48, 59, 46, 52, 54, 46, 97, 42, 49, 58, 60, 99

In this case, it can be observed that there are some observations which are very far from other observations. Therefore, here, median will be calculated as an appropriate measure of central tendency.

