RD Sharma Solutions

Class 7

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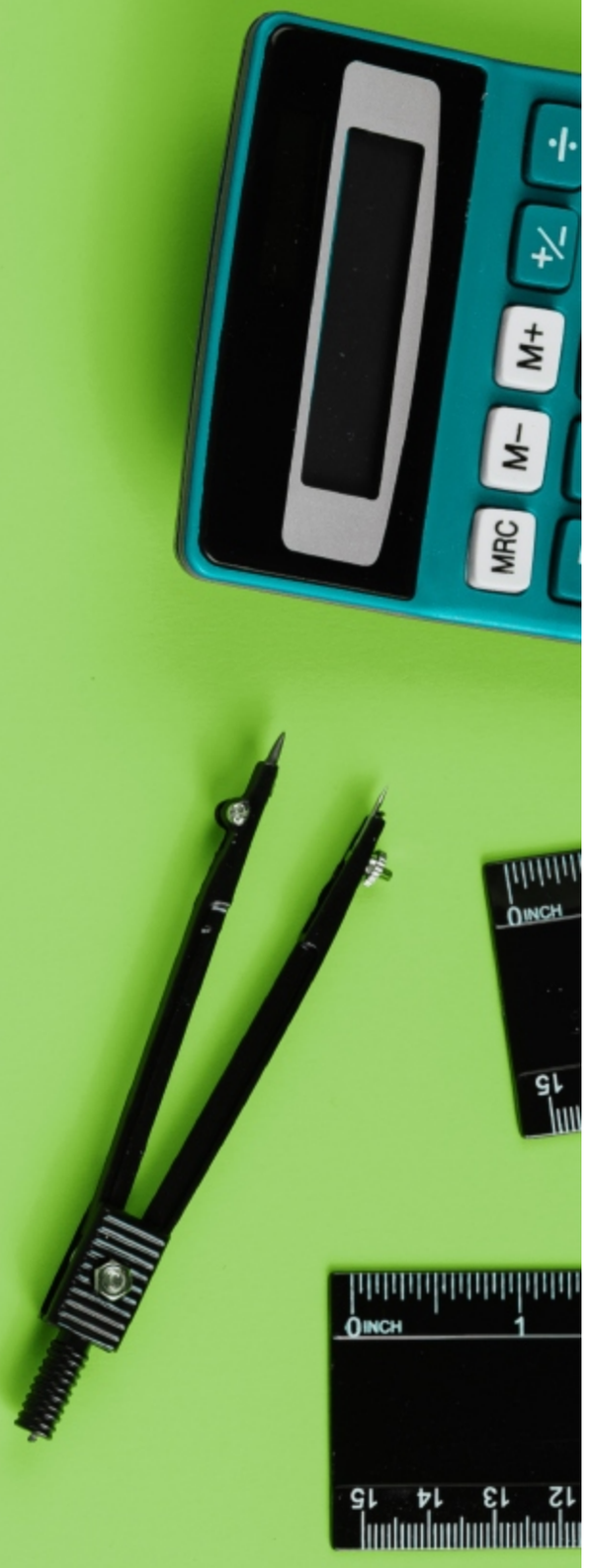

Exercise 23.4

Q.1 Find the mode and median of the data 13, 16, 12, 14, 19, 12, 14, 13, 14. By using the empirical relation also find the median.

Solution: Ascending order of data

12, 12, 13, 13, 14, 14, 14, 16, 19

here $n = 9$

$$\text{Median} = \left(\frac{n+1}{2}\right)^{th} \text{term} = \left(\frac{9+1}{2}\right)^{th} \text{term}$$

$$= 5^{th} \text{ term}$$

$$= 14$$

here, 14 occurs maximum number of times i.e 3 times, hence

$$\text{Mode} = 14$$

Now empirical relation

$$\text{Mode} = 3\,\text{Median} - 2\,\text{Mean}$$

$$\Rightarrow \quad 14 = 3 \times 14 - 2\,\text{Mean}$$

$$\Rightarrow \quad 2\,\text{Mean} = 42 - 14$$

$$= 28$$

$$\Rightarrow \quad \text{Mean} = \frac{28}{2} = 14$$

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Q.2 Find the median and mode of the data.

35, 32, 35, 42, 38, 32, 34

Solution: Ascending order is as follows:

32, 32, 34, 35, 35, 38, 42

here $n=7$

$\therefore$ Median $= \left(\frac{7+1}{2}\right)^{th}$ term

$= 4^{th}$ term

$= 35$

here 32 and 35 occurs twice. therefore 32 and 35 are two modes of data.

Q.3 Find the mode of the data:

2, 6, 5, 3, 0, 3, 4, 3, 2, 4, 5, 2, 4.

Solution: By arranging the data in ascending order.

0, 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 6.

here 2, 3, 4 occurs three times each.

$\therefore$ 2, 3, and 4 are modes of data.

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Q.4 The runs scored in a cricket match by 11 players are as follows:

6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 10.

Find the mean, median and mode of the data

Solution:

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

here sum $= 6+15+120+50+100+80+10+15+8+10+10$

$$\therefore \frac{424}{11} = 38.54$$

Median: Arranging the data in ascending order.

6, 8, 10, 10, 10, 15, 15, 50, 80, 100, 120

here $n = 11$

$$\text{Median} = \left(\frac{11+1}{2}\right)^{th} \text{term} = 6^{th} \text{term}$$

$$= 15$$

Mode: $\because$ Value 10 is occuring most times

i.e three times.

Therefore, Mode $= 10$

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Q5 Find the mode of the following data.

12, 14, 16, 12, 14, 14, 16, 14, 10, 14, 18, 14.

Solution: Arranging the data in ascending order:

10, 12, 12, 14, 14, 14, 14, 14, 14, 16, 18

here the term 14 occuring most i.e six times.

∴ Mode = 14

Q6 Heights of 25 children (in cm) in a school are as given below

168, 165, 163, 160, 163, 161, 162, 164, 163, 162, 164, 163, 160
163, 163, 165, 163, 162, 163, 164, 163, 160, 165, 163, 162

What is the mode of heights?
Also, find the mean and median.

Solution: Arranging data in tabular form:

Heights (cm)	Taley Marks	Frequency
160	III	3
161	I	1
162	IIII	4
163	IIII IIII	10
164	III	3
165	III	3
168	I	1

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Solution:

here, 163 is occuring mostly.

$\therefore$ Mode = 163

For Median: here $n=25$

$\therefore$ Median $= \left(\frac{25+1}{2}\right)^{th}$ term $= \left(\frac{26}{2}\right)^{th}$

$= 13^{th}$ term $= 163$

Mean:

$\because$ Mode = 3 Median − 2 Mean

$\Rightarrow$ Mean $= \frac{3\text{Median} - \text{Mode}}{2}$

$= \frac{3\times 63 - 63}{2} = \frac{2\times 63}{2}$

$= 63$

Q.7 The scores in mathematics tes (out of 25) of 15 students are as follows

19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20

Find the Mode and Median of the data. Are they same?

Solution: Arranging the data in ascending order

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25

here $n=15$

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$$\text{Median} = \left(\frac{n+1}{2}\right)^{th} \text{term} = \left(\frac{15+1}{2}\right)^{th} \text{term}$$

$$= 8^{th} \text{ term}$$

$$= 20$$

Here, clearly 20 occurs most number of times.

therefore

Mode = 20.

Yes, here Median and Mode are same.

Q.8 Calculate the Mean and Median of following data:

Marks	10	11	12	13	14	16	19	20
No. of students	3	5	4	5	2	3	2	1

using empirical formula, find its Mode.

Solution:

Marks	f_i	$f_i x_i$
10	3	30
11	5	55
12	4	48
13	5	65
14	2	28
16	3	48
19	2	38
20	1	20

here $\Sigma f_i x_i = 332$

$$\therefore \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{332}{25}$$

$$= 13.28$$

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