RD Sharma Solutions

Class 7

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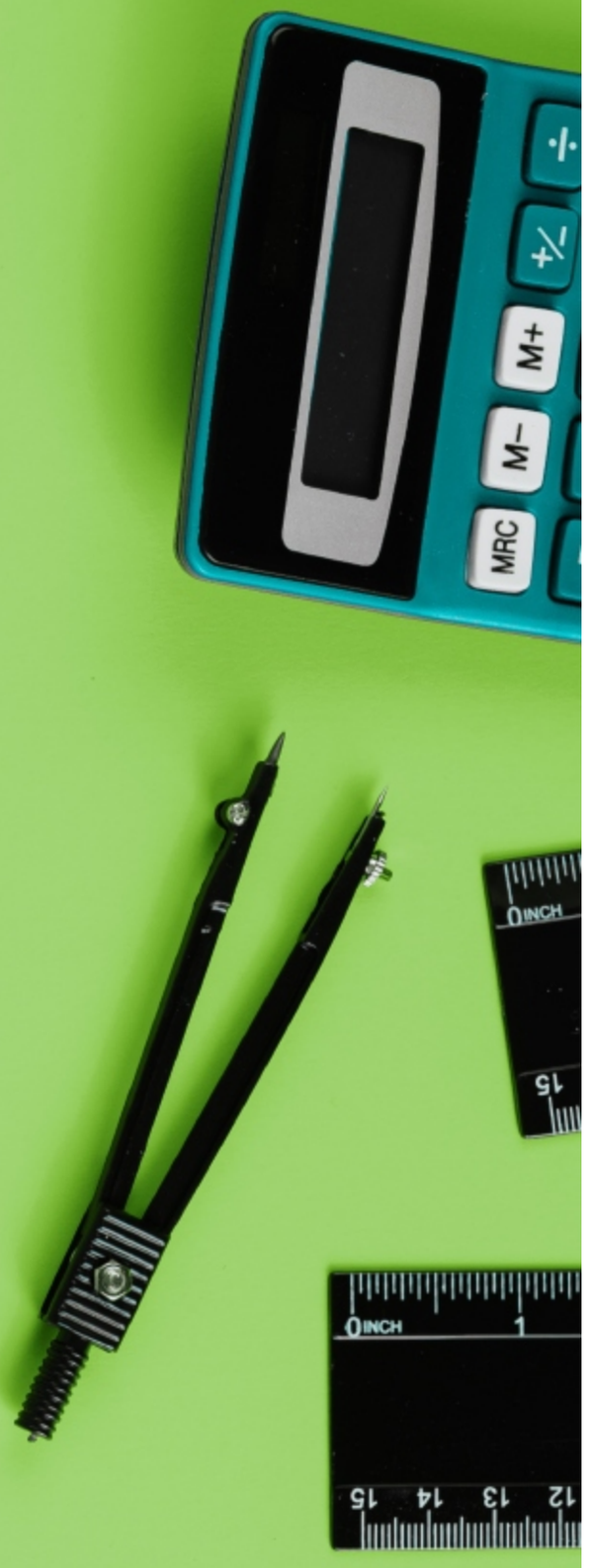

Exercise 23.2

Q.1 A die was thrown 20 times and the follow scores were recorded.

5, 2, 1, 3, 4, 4, 5, 6, 2, 2, 4, 5, 5, 6, 2, 2, 4, 5, 5, 1

Prepare a frequency table of the scores on the upper face of the die and find the mean score.

Solution:

Score (x_i)	f_i	$f_i x_i$
1	2	2
2	5	10
3	1	3
4	4	16
5	6	30
6	2	12
Total	20	73

$$\therefore \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{73}{20} = 3.65$$

Q2 The daily wages (in Rs.) of 15 workers in a factory are given below

200, 180, 150, 150, 130, 180, 180, 200, 150, 130, 180

180, 200, 150, 180

Prepare a frequency table and find the mean wage

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Solution :

Wages (x_i)	No. of workers f_i	$f_i x_i$
130	2	260
150	4	600
180	6	1080
200	3	600
Total	15	2540.

$\because$ Mean $= \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{2540}{15} = 169.33$

Q.3 The following table shows the weights (in kg) of 15 workers in a factory.

Weight (in kg):	60	63	66	72	75
Number of workers:	4	5	3	1	2

Calculate the mean weight.

Solution

Weight (x_i)	f_i	$f_i x_i$
60	4	240
63	5	315
66	3	198
72	1	72
75	2	150
Total	15	975

$\because \bar{x} = \frac{\Sigma f_i x_i}{\Sigma f_i}$

$= \frac{975}{15}$

$= 65$ kg

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Q.4 The ages (in years) of 50 students of a class in a school are given below.

Age (In yrs)	14	15	16	17	18
No. of students	15	14	10	8	3

Calculate the mean weight.

Solution:

Age (x_i)	f_i	$f_i x_i$
14	15	210
15	14	210
16	10	160
17	8	136
18	3	54
Total	50	770

$$\text{Mean score} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{770}{50} = 15.4 \text{ years.}$$

Q.5 Calculate the mean distribution.

x:	5	6	7	8	9
f:	4	8	14	11	3

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Solution:

x_i	f_i	$f_i x_i$
5	4	20
6	8	48
7	14	98
8	11	88
9	3	27
Total	N=40	281

$$\text{mean score} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{281}{40} = 7.025$$

Q6 Find the mean of the following data:

x:	19	21	23	25	27	29	31
f:	13	15	16	18	16	15	13

Solution:

x_i:	19	21	23	25	27	29	31	Total
f_i:	13	15	16	18	16	15	13	106
$f_i x_i$:	247	315	368	450	432	435	403	2650

$$\because \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{2650}{106} = 25$$

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Q.7 The mean of the following data is 20.6. Find the value of p.

x :	10	15	p	25	35
f :	3	10	25	7	5

Solution

x_i	f_i	$f_i x_i$
10	3	30
15	10	150
p	25	25 p
25	7	175
35	5	175
Total	50	530+25P

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

$$= 20.6 = \frac{530+25P}{50}$$

$$\Rightarrow 1030 = 530+25P$$

$$\Rightarrow 25P = 1030-530$$

$$25P = 500$$

$$\Rightarrow P = \frac{500}{25} = 20$$

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Q8 If the mean of the following data is 15, find p

x:	5	10	15	20	25
f:	6	p	6	10	5

Solution:

x_i	f_i	$f_i x_i$
5	6	30
10	p	$10p$
15	6	90
20	10	200
25	5	125
Total	$27+p$	$445+10p$

$$\because \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i} \Rightarrow 15 = \frac{445+10p}{27+p}$$

$$\Rightarrow 15(27+p) = 445+10p$$

$$\Rightarrow 405+15p = 445+10p$$

$$\Rightarrow 15p - 10p = 445 - 405$$

$$\Rightarrow 5p = 40$$

$$p = \frac{40}{5} = 8$$

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Q.9 Find the value of p for the following distribution whose mean is 16.6.

Solution:

x :	8	12	15	p	20	25	30
f :	12	16	20	24	16	8	4

Solution:

x	f	fix_i
8	12	96
12	16	192
15	20	300
p	24	$24p$
20	16	320
25	8	200
30	4	120
Total	100	$1228+24p$

$$\text{Mean} = \frac{\Sigma fix_i}{\Sigma fi} \Rightarrow 16.6 = \frac{1228+24p}{100}$$

$$\Rightarrow 1660 - 1228 = 24p$$

$$\Rightarrow 24p = 432$$

$$p = \frac{432}{24} = 18$$

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Q.10 Find the missing value of p for the following distribution whose mean is 12.58.

x :	5	8	10	12	p	20	25
f :	2	5	8	22	7	4	2

Solution :

x	f	$f_i x_i$
5	2	10
8	5	40
10	8	80
12	22	264
p	7	7p
20	4	80
25	2	50
Total	50	524+7p

$$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

$$\Rightarrow 12.58 = \frac{524+7p}{50} \Rightarrow 7p = 629-524$$

$$7p = 105$$

$$\Rightarrow p = \frac{105}{7}$$

$$= 15$$

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Q.11 Find the missing frequency (p) for the following distribution whose mean is 7.68

x	3	5	7	9	11	13
f	6	8	15	p	8	4

Solution:

x	f	$f_i x_i$
3	6	18
5	8	40
7	15	105
9	p	$9p$
11	8	88
13	4	52
Total	$41+p$	$303+9p$

$$\text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

$$\Rightarrow 7.68 = \frac{303+9p}{41+p}$$

$$\Rightarrow 303+9p = 314.88 + 7.68p$$

$$\Rightarrow 1.32p = 314.88 - 303 = 11.88$$

$$\Rightarrow p = \frac{11.88}{1.32} = 9$$

$$p = 9$$

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Q.12 Find the value of p, if the mean of following distribution is 20

x:	15	17	19	$20+p$	23
f:	2	3	4	$5p$	6

Solution :

x_i	f_i	$f_i x_i$
15	2	30
17	3	51
19	4	76
$20+p$	$5p$	$100p+5p^2$
23	6	138
Total	$15+5p$	$5p^2+100p+295$

$$\because \text{Mean} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

$$\Rightarrow 20 = \frac{5p^2+100p+295}{15+5p}$$

$$= 300+100p = 5p^2+295+100p$$

$$\Rightarrow 5p^2 = 300-295$$

$$5p^2 = 5$$

$$p^2 = 1 \Rightarrow p = 1$$

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