

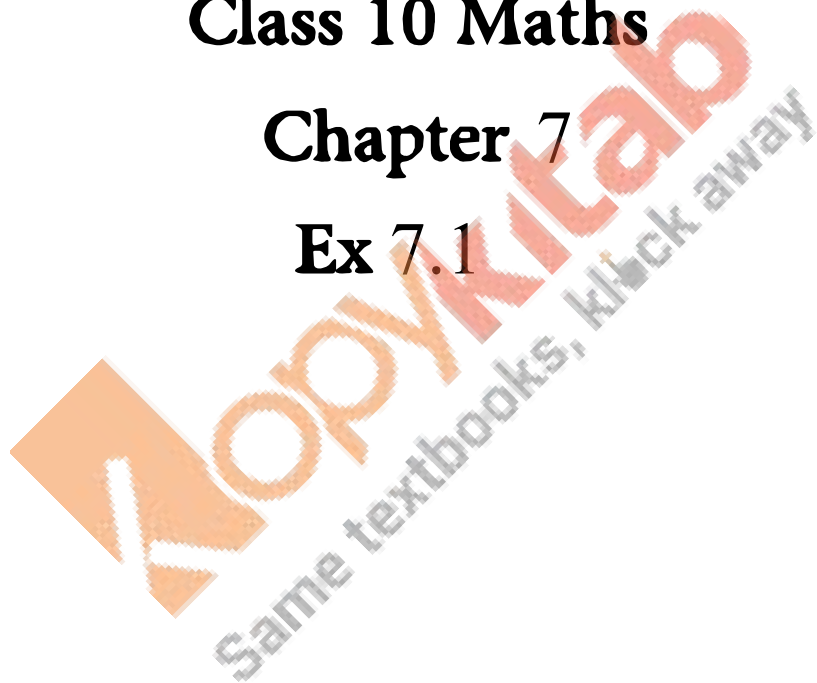
RD SHARMA

Solutions

Class 10 Maths

Chapter 7

Ex 7.1



Q.1: Calculate the mean for the following distribution:

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

Sol:

X	f	fx
5	4	20
6	8	48
7	14	98
8	11	88
9	3	27
	N = 40	281

Mean = $281/4 = 7.025$

2. Find the mean of the following data:

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

Soln:

X	f	fx
18	13	247
21	15	315
23	16	368

25	18	450
27	16	432
29	15	435
31	13	403
	N = 106	Sum = 2620

$$\text{Mean } (x) = 2680/106 = 25$$

3. If 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

Soln:

X	f	fx
10	3	30
5	10	150
P	25	25p
25	7	175
35	5	175
	N = 106	Sum = 2620

Given

$$\text{Mean} = 20.6$$

$$(530+25p)/50 = 20.6$$

$$25p = 20.6$$

$$P = 20$$

4. If the mean of the following data is 15, find p

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

Soln:

X	f	fx
5	6	30
10	P	10p
15	6	90
20	10	200
25	5	125
	N = p+27	Sum = 10p + 445

Given

Mean = 15

$$(10p + 445)/(p+27) = 15$$

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

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

$$5p = 40$$

$$P = 8$$

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

X:	8	12	15	p	
	20	25	30		
F:	12	16	20	24	16

Soln:

X	f	fx
8	12	96
12	12	192
15	20	300
P	24	24p
20	16	320
25	8	200
30	4	120
	N = 100	Sum = 24p + 1228

Given

$$\text{Mean} = 16.6$$

$$(24p + 1228)/100 = 16.6$$

$$24p + 1228 = 1660$$

$$24p = 1660 - 1228$$

$$P = 432/24$$

$$P = 18$$

6. 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

Soln:

x	f	fx
5	2	10
8	5	40
10	8	80
12	22	264
P	7	7p
20	24	480
25	2	50
	N = 50	Sum = 524 + 7p

Given mean = 12.58

Sum/N = 12.58

$(524 + 7p)/50 = 12.58$

$524 + 7p = 629$

$7p = 105$

$P = 15$

7. 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		

Soln:

X	f	fx
3	6	18
5	8	40
7	15	105
9	p	9p
11	8	88
13	4	52
	$N = P + 41$	Sum $9p = 303$

Given

$$\text{Mean} = 7.68$$

$$(7p+303)/p+41 = 7.68$$

$$9p + 303 = p(7.68) + 314.88$$

$$9p - p(7.68) = 314.88 - 303$$

$$1.32p = 11.88$$

$$P = (11.88)/1.32$$

$$P = 9$$

8. The following table gives the number of boys of a particular age in a class of 40 students. Calculate the mean age of the students.

Ages (in years):	15	16	19	17 20	18
No of students:	3	8	10 4	10	5

Soln:

x	f	fx
15	3	45
16	8	128
17	10	170
18	10	180
19	5	95
20	4	80
	N = 40	Sum = 698

Mean age = sum/ N

= 698/ 40

= 17.45 years

9.Candidates of four schools appear in a mathematics test. The data were as follows:

Schools	No of candidates	Average score
I	60	75
II	48	80
III	P	55
IV	40	50

If the average score of the candidates of all the four schools is 66, find the number of candidates that appeared from school III.

Soln: Let the number candidates from school III = P

Schools	No of candidates N_i	Average scores (x_i)
I	60	75
II	48	80
III	P	55
IV	40	50

Given

Average score of all schools = 66

$$\frac{N_1x_1 + N_2x_2 + N_3x_3 + N_4x_4}{N_1 + N_2 + N_3 + N_4} = \frac{4500 + 3340 + 55p + 2000}{60 + 48 + p + 40} = 66$$

$$10340 + 55p = 66p + 9768$$

$$10340 - 9768 = (66 - 55)p$$

$$P = 572/11$$

$$P = 52$$

10. Five coins were simultaneously tossed 1000 times and at each toss, the number of heads was observed. The number of tosses during which 0, 1, 2, 3, 4 and 5 heads were obtained are shown in the table below. Find the mean number of heads per toss.

No of heads per toss	No of tosses
0	38
1	144
2	342
3	287
4	164
5	25
Total	1000

Soln:

No of heads per toss	No of tosses
0	38
1	144
2	342
3	287
4	164
5	25

No of heads per toss	No of tosses	fx
0	38	0
1	144	144
2	342	684
3	287	861
4	164	656
5	25	125

Mean number of heads per toss = $2470/1000 = 2.47$

Mean = 2.47

12. The arithmetic mean of the following data is 25. Find the value of k.

$X_i:$	5	15	25	35	45
$f_i:$	3	k	3	6	2

Sol:

X	f	fx
5	3	15
15	k	15k
25	3	75
35	6	210
45	2	90
	$N = k + 120$	$\text{Sum} = 15k + 390$

Given mean = 25

$\text{Sum} / N = 25$

$$15k + 390 = 25k + 350$$

$$25k - 15k = 40$$

$$10k = 40$$

$$k = 4$$

13. If the mean of the following data is 18.75. Find the value of p.

$X_i:$	10	15	p	25	30
$F_i:$	5	10	7	8	2

Soln:

X	f	fx
10	5	50
15	10	150
P	7	7p
25	8	200

30	2	60
	$N = k + 120$	$\text{Sum} = 1p + 460$

Given mean = 18.75

$\text{Sum} / N = 18.75$

$7p + 460 = 600$

$7p = 140$

$P = 20$

14. Find the value of p. If the mean of the following distribution is 20.

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

Soln:

X	f	fx
15	2	30
17	3	51
19	4	76
20 + p	5p	$100p + 5p^2$
23	6	138
	$N = 5p + 15$	$\text{Sum} = 295 + 100p + 5p^2$

Given Mean = 20

$\text{Sum} / N = 20$

$(295 + 100p + 5p^2) / (5 + 15) = 20$

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

$$5p^2 - 5 = 0$$

$$5(p^2 - 1) = 0$$

$$p^2 - 1 = 0$$

$$p = (+1, -1)$$

$$\text{If } p + 1 = 0$$

$$p = -1$$

$$\text{Or } p - 1 = 0$$

$$p = 1$$

15. Find the missing frequencies in the following frequency distribution if it is known that the mean of the distribution is 50.

X:	10	30	50	70	90
f:	17	f_1	32	f_2	19

Soln:

x	f	fx
10	17	170
30	f_1	$30f_1$
50	32	1600
70	f_2	$70f_2$
90	19	1710
	$N = 120$	Sum = $30f_1 + 70f_2 + 3480$

Given mean

$$\text{Sum/ } N = 50$$

$$30f_1 + 70f_2 + 3480 / 120 = 50$$

$$30f_1 + 70f_2 + 3480 = 6000 \text{ --- (1)}$$

Also, sum of f = 120

$$17 + f_1 + 32 + f_2 + 19 = 120$$

$$f_1 + f_2 = 52$$

$$f_1 = 52 - f_2$$

Substituting the value of f_1 in (1)

$$30(52 - f_2) + 70f_2 + 3480 = 6000$$

$$f_2 = 24$$

$$\text{Hence } f_1 = 52 - 24 = 28$$

$$f_1 = 28 \quad ; \quad f_2 = 24$$

