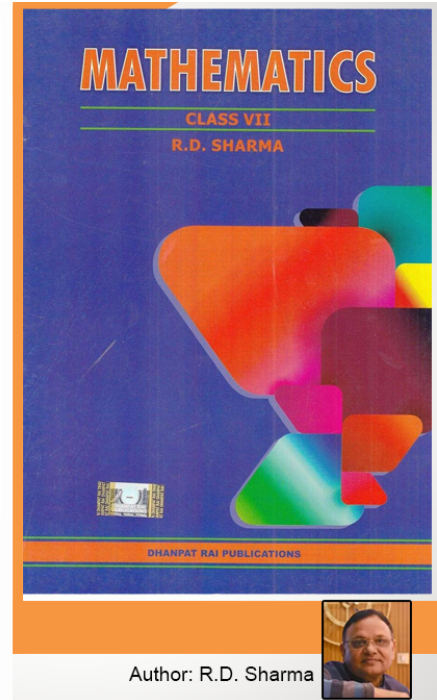


# **Class 7 - Chapter 23 Data Handling - II Central Values**



## **RD Sharma Solutions for Class 7 Maths Chapter 23–Data Handling - II Central Values**

Class 7: Maths Chapter 23 solutions. Complete Class 7 Maths Chapter 23 Notes.

### **RD Sharma Solutions for Class 7 Maths Chapter 23–Data Handling - II Central Values**

RD Sharma 7th Maths Chapter 23, Class 7 Maths Chapter 23 solutions

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>



Exercise 23.1 Page No: 23.6

**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:**

Given Ashish studies for 4 hours, 5 hours and 3 hours on three consecutive days

Average number of study hours = sum of hours/ number of days

Average number of study hours =  $(4 + 5 + 3) \div 3$

=  $12 \div 3$

= 4 hours

Thus, Ashish studies for 4 hours on an average.

**2. A cricketer scores the following runs in 8 innings: 58, 76, 40, 35, 48, 45, 0, 100.**

**Find the mean score.**

**Solution:**

Given runs in 8 innings: 58, 76, 40, 35, 48, 45, 0, 100

Mean score = total sum of runs/number of innings

The mean score =  $(58 + 76 + 40 + 35 + 48 + 45 + 0 + 100) \div 8$

=  $402 \div 8$

= 50.25 runs.

**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 the lowest marks obtained by the students.**

**(ii) Range of marks obtained.**

**(iii) Mean marks obtained by the group.**

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**Solution:**

In order to find the highest and lowest marks, we have to arrange the marks in ascending order as follows:

39, 48, 56, 75, 76, 81, 84, 85, 90, 95

(i) Clearly, the highest mark is 95 and the lowest is 39.

(ii) The range of the marks obtained is:  $(95 - 39) = 56$ .

(iii) From the following data, we have

Mean marks = Sum of the marks/ Total number of students

Mean marks =  $(39 + 48 + 56 + 75 + 76 + 81 + 84 + 85 + 90 + 95) \div 10$

=  $729 \div 10$

= 72.9.

Hence, the mean mark of the students is 72.9.

**4. The enrolment of a school during six consecutive years was as follows:**

**1555, 1670, 1750, 2019, 2540, 2820**

**Find the mean enrolment of the school for this period.**

**Solution:**

Given enrolment of a school during six consecutive years as follows

1555, 1670, 1750, 2019, 2540, 2820

The mean enrolment = Sum of the enrolments in each year/ Total number of years

The mean enrolment =  $(1555 + 1670 + 1750 + 2019 + 2540 + 2820) \div 6$

=  $12354 \div 6$

= 2059.

Thus, the mean enrolment of the school for the given period is 2059.

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

5. The rainfall (in mm) in a city on 7 days of a certain week was recorded as follows:

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

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

(ii) Find the mean rainfall for the week.

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

**Solution:**

(i) The range of the rainfall = Maximum rainfall – Minimum rainfall

$$= 20.5 - 0.0$$

$$= 20.5 \text{ mm.}$$

(ii) The mean rainfall =  $(0.0 + 12.2 + 2.1 + 0.0 + 20.5 + 5.3 + 1.0) \div 7$

$$= 41.1 \div 7$$

$$= 5.87 \text{ mm.}$$

(iii) Clearly, there are 5 days (Mon, Wed, Thu, Sat and Sun), when the rainfall was less than the mean, i.e., 5.87 mm.

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

**Solution:**

The mean height = Sum of the heights / Total number of persons

$$= (140 + 150 + 152 + 158 + 161) \div 5$$

$$= 761 \div 5$$

$$= 152.2 \text{ cm.}$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

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

**Solution:**

Mean = Sum of the given numbers/Total number of given numbers

$$\text{Mean} = (994 + 996 + 998 + 1002 + 1000) \div 5$$

$$= 4990 \div 5$$

$$= 998.$$

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

**Solution:**

We know that first five natural numbers = 1, 2, 3, 4 and 5

$$\text{Mean of first five natural numbers} = (1 + 2 + 3 + 4 + 5) \div 5$$

$$= 15 \div 5$$

$$= 3$$

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

**Solution:**

We know that factors of 10 are 1, 2, 5 and 10

$$\text{Arithmetic mean of all factors of 10} = (1 + 2 + 5 + 10) \div 4$$

$$= 18 \div 4$$

$$= 4.5$$

**10. Find the mean of first 10 even natural numbers.**

**Solution:**

The first 10 even natural numbers are 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20.

$$\text{Mean of first 10 even natural numbers} = (2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20) \div 10$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$= 110 \div 10$$

$$= 11$$

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

**Solution:**

Mean = Sum of observations  $\div$  Number of observations

$$\text{Mean} = (x + x + 2 + x + 4 + x + 6 + x + 8) \div 5$$

$$\text{Mean} = (5x + 20) \div 5$$

$$\text{Mean} = 5(x + 4) \div 5$$

$$\text{Mean} = x + 4$$

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

**Solution:**

The first five multiples of 3 are 3, 6, 9, 12 and 15.

$$\text{Mean of first five multiples of 3 are} = (3 + 6 + 9 + 12 + 15) \div 5$$

$$= 45 \div 5$$

$$= 9$$

**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  $\overline{XX}$**

**Solution:**

We know that  $\overline{XX} = \text{sum of observations} / \text{number of observations}$   $\overline{XX} = \text{sum of weights of babies} / \text{number of babies}$   $\overline{XX} = (3.4 + 3.6 + 4.2 + 4.5 + 3.9 + 4.1 + 3.8 + 4.5 + 4.4 + 3.6) \div 10$   $\overline{XX} = (40) \div 10$   $\overline{XX} = 4 \text{ kg}$

**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.**

**Solution:**

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$\begin{aligned}\text{Mean} &= \text{sum of the marks obtained} / \text{total number of students} \\ &= (64 + 36 + 47 + 23 + 0 + 19 + 81 + 93 + 72 + 35 + 3 + 1) \div 12 \\ &= 474 \div 12 \\ &= 39.5\%\end{aligned}$$

**15. The numbers 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:**

$$\begin{aligned}\text{Mean number of children per family} &= \text{sum of total number of children} / \text{total number of families} \\ &= (2 + 4 + 3 + 4 + 2 + 3 + 5 + 1 + 1 + 5) \div 10 \\ &= 30 \div 10 \\ &= 3\end{aligned}$$

Thus, on an average there are 3 children per family in the locality.

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

**Solution:**

Given  $n$  = the number of observations = 100, Mean = 40

Mean = sum of observations / total number of observations

$$40 = \text{sum of the observations} / 100$$

$$\text{Sum of the observations} = 40 \times 100$$

$$\text{Thus, the incorrect sum of the observations} = 40 \times 100 = 4000.$$

Now,

The correct sum of the observations = Incorrect sum of the observations – Incorrect observation + Correct observation

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

The correct sum of the observations =  $4000 - 83 + 53$

The correct sum of the observations =  $4000 - 30 = 3970$

Correct mean = correct sum of the observations/ number of observations

=  $3970/100$

= 39.7

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

**Solution:**

We know that

Mean = sum of five numbers/5 = 27

So, sum of the five numbers =  $5 \times 27 = 135$ .

Now,

The mean of four numbers = sum of the four numbers/4 = 25

So, sum of the four numbers =  $4 \times 25 = 100$ .

Therefore, the excluded number = Sum of the five number – Sum of the four numbers

The excluded number =  $135 - 100$

= 35.

**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:**

We know that

Mean = sum of weights of students/ number of students

Let the weight of the seventh student be x kg.

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>



$$\text{Mean} = (52 + 54 + 55 + 53 + 56 + 54 + x) / 7$$

$$55 = (52 + 54 + 55 + 53 + 56 + 54 + x) / 7$$

$$55 \times 7 = 324 + x$$

$$385 = 324 + x$$

$$x = 385 - 324$$

$$x = 61 \text{ kg.}$$

Therefore weight of seventh student is 61kg.

**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 the eight numbers whose mean is 15 kg. Then,

$$15 = (x_1 + x_2 + x_3 + \dots + x_8) / 8$$

$$x_1 + x_2 + x_3 + \dots + x_8 = 15 \times 8$$

$$x_1 + x_2 + x_3 + \dots + x_8 = 120.$$

Let the new numbers be  $2x_1, 2x_2, 2x_3, \dots, 2x_8$ .

Let M be the arithmetic mean of the new numbers.

Then,

$$M = (2x_1 + 2x_2 + 2x_3 + \dots + 2x_8) / 8$$

$$M = 2 (x_1 + x_2 + x_3 + \dots + x_8) / 8$$

$$M = (2 \times 120) / 8$$

$$= 30$$

**20. The mean of 5 numbers is 18. If one number is excluded, their mean is 16. Find the excluded number.**

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**Solution:**

Let  $x_1, x_2, x_3, x_4$  and  $x_5$  be five numbers whose mean is 18. Then,

$$18 = \text{Sum of five numbers} \div 5$$

$$\text{Hence, sum of five numbers} = 18 \times 5 = 90$$

Now, if one number is excluded, then their mean is 16.

So,

$$16 = \text{Sum of four numbers} \div 4$$

$$\text{Therefore sum of four numbers} = 16 \times 4 = 64.$$

$$\text{The excluded number} = \text{Sum of five observations} - \text{Sum of four observations}$$

$$\text{The excluded number} = 90 - 64$$

$$\text{Therefore The excluded number} = 26.$$

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

**Solution:**

$$\text{Given } n = \text{Number of observations} = 200$$

$$\text{Mean} = \text{sum of observations} / \text{number of observations}$$

$$50 = \text{sum of observations} / 200$$

$$\text{Sum of the observations} = 50 \times 200 = 10,000.$$

$$\text{Thus, the incorrect sum of the observations} = 50 \times 200$$

Now,

$$\text{The correct sum of the observations} = \text{Incorrect sum of the observations} - \text{Incorrect observations} + \text{Correct observations}$$

$$\text{Correct sum of the observations} = 10,000 - (92 + 8) + (192 + 88)$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

Correct sum of the observations =  $10,000 - 100 + 280$

Correct sum of the observations =  $9900 + 280$

Correct sum of the observations =  $10,180$ .

Therefore correct mean = correct sum of the observations/ number of observations

=  $10180/200$

=  $50.9$

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

**Solution:**

Given Mean = Sum of five numbers  $\div 5$

Sum of the five numbers =  $27 \times 5 = 135$ .

Now, New mean = 25

$25 = \text{Sum of six numbers} \div 6$

Sum of the six numbers =  $25 \times 6 = 150$ .

The included number = Sum of the six numbers – Sum of the five numbers

The included number =  $150 - 135$

Therefore the included number = 15.

**23. The mean of 75 numbers is 35. If each number is multiplied by 4, find the new mean.**

**Solution:**

Let  $x_1, x_2, x_3, \dots, x_{75}$  be 75 numbers with their mean equal to 35. Then,

$$35 = (x_1 + x_2 + x_3 + \dots + x_{75}) / 75$$

$$x_1 + x_2 + x_3 + \dots + x_{75} = 35 \times 75$$

$$x_1 + x_2 + x_3 + \dots + x_{75} = 2625$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

The new numbers are  $4 \times 1, 4 \times 2, 4 \times 3 \dots 4 \times 75$

Let  $M$  be the arithmetic mean of the new numbers. Then,

$$M = \frac{4x_1 + 4x_2 + 4x_3 + \dots + 4x_{75}}{75}$$

$$M = \frac{4(x_1 + x_2 + x_3 + \dots + x_{75})}{75}$$

$$M = \frac{4 \times 2625}{75}$$

$$= 140$$

---

Exercise 23.2 Page No: 23.12

**1. A die was thrown 20 times and the following scores were recorded:**

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

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

**Solution:**

The frequency table for the given data is as follows:

x:      1   2   3   4   5   6

f:    2   5   1   4   6   2

To compute arithmetic mean we have to prepare the following table:

Scores ( $x_i$ )	Frequency ( $f_i$ )	$x_i f_i$
1	2	2
2	5	10

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

3	1	3
4	4	16
5	6	30
6	2	12
Total	$\Sigma f_i = 20$	$\Sigma f_i x_i$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$= 73/20$$

$$= 3.65$$

**2. 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 the frequency table and find the mean wage.**

**Solution:**

	130	150	180	200
Wages ( $x_i$ )				
Number of workers ( $f_i$ )	2	4	6	3

To compute arithmetic mean we have to prepare the following table:

$x_i$	$f_i$	$x_i f_i$
130	2	260
150	4	600
180	6	1080
200	3	600

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$\text{Total } \Sigma f_i = N = 15 \quad \Sigma f_i x_i = 2540$$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$= 2540/15$$

$$= 169.33$$

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:**

Calculation of mean:

$x_i$	$f_i$	$x_i f_i$
60	4	240
63	5	315
66	3	198
72	1	72
75	2	150

$$\text{Total } \Sigma f_i = N = 15 \quad \Sigma f_i x_i = 975$$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$= 975/15$$

$$= 65 \text{ kg}$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

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

	14	15	16	17	18
Age (in years)					
Number of students	15	14	10	8	3

Find the mean age.

**Solution:**

Calculation of mean:

$x_i$	$f_i$	$x_i f_i$
14	15	210
15	14	210
16	10	160
17	8	136
18	3	54
Total	$\Sigma f_i = N = 50$	$\Sigma f_i x_i = 770$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$= 770/50$$

$$= 15.4 \text{ years}$$

5. Calculate the mean for the following distribution:

	5	6	7	8	9
x:					

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**f: 4 8 14 11 3**

**Solution:**

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

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$= 281/40$$

$$= 7.025$$

**6. Find the mean of the following data:**

**19 21 23 25 27 29 31**  
**x:**

**f: 13 15 16 18 16 15 13**

**Solution:**

$x_i$	$f_i$	$x_i f_i$
19	13	247

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>



21	15	315
----	----	-----

23	16	368
----	----	-----

25	18	450
----	----	-----

27	16	432
----	----	-----

29	15	435
----	----	-----

31	13	403
----	----	-----

Total	$\Sigma f_i = N = 106$	$\Sigma f_i x_i = 2650$
-------	------------------------	-------------------------

Mean score =  $\Sigma f_i x_i / \Sigma f_i$

=  $2650/106$

= 25

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:**

$x_i$	$f_i$	$x_i f_i$
10	3	30
15	10	150
P	25	25p
25	7	175
35	5	175

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$\text{Total } \Sigma f_i = N = 50 \quad \Sigma f_i x_i = 530 + 25p$$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

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

$$530 + 25p = 20.6 \times 50$$

$$25p = 1030 - 530$$

$$p = 500/25$$

$$p = 20$$

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

**x:**      5   10   15   20   25

**f:**    6   p    6   10   5

**Solution:**

$x_i$	$f_i$	$x_i f_i$
5	6	30
10	P	10p
15	6	90
20	10	200
25	5	125

$$\text{Total } \Sigma f_i = 27 + p \quad \Sigma f_i x_i = 445 + 10p$$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

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

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

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

$$5p = 445 - 405$$

$$p = 40/5$$

$$p = 8$$

9. 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	8	4

**Solution:**

$x_i$	$f_i$	$x_i f_i$
8	12	96
12	16	192
15	20	300
$P$	24	$24p$
20	16	320
25	8	200
30	4	120
Total	$\Sigma f_i = N = 100$	$\Sigma f_i x_i = 1228 + 24p$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

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

$$1228 + 24p = 16.6 \times 100$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$24p = 1660 - 1228$$

$$p = 432/24$$

$$p = 18$$

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:**

$x_i$	$f_i$	$x_i f_i$
5	2	10
8	5	40
10	8	80
12	22	264
P	7	7p
20	4	80
25	2	50
Total	$\Sigma f_i = N = 50$	$\Sigma f_i x_i = 524 + 7p$

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

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

$$524 + 7p = 12.58 \times 50$$

$$7p = 629 - 524$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$p = 105/7$$

$$p = 15$$

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:**

$x_i$	$f_i$	$x_i f_i$
3	6	18
5	8	40
7	15	105
9	P	9p
11	8	88
13	4	52

$$\text{Total } \Sigma f_i = N = 41 + p \quad \Sigma f_i x_i = 303 + 9p$$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$7.68 = 303 + 9p / 41 + p$$

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

$$1.32p = 314.88 - 303$$

$$p = 11.88 / 1.32$$

$$p = 9$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

12. 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

**Solution:**

$x_i$	$f_i$	$x_i f_i$
15	2	30
17	3	51
19	4	76
$20 + p$	$5P$	$(20 + p) 5p$
23	6	138
Total	$\Sigma f_i = 15 + 5p$	$\Sigma f_i x_i = 295 + (20 + p) 5p$

$$\text{Mean score} = \Sigma f_i x_i / \Sigma f_i$$

$$20 = [(295 + (20 + p) 5p)] / 15 + 5p$$

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

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

$$5p^2 = 5$$

$$p^2 = 1$$

$$p = 1$$

---

Exercise 23.3 Page No: 23.16

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**Find the median of the following data (1 – 8)**

**1. 83, 37, 70, 29, 45, 63, 41, 70, 34, 54**

**Solution:**

First we have to arrange given data into ascending order,

29, 34, 37, 41, 45, 54, 63, 70, 70, 83

Given number of observations,  $n = 10$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 5<sup>th</sup> term + value of 6<sup>th</sup> term)/2

$$= (45 + 54)/2$$

$$= 49.5$$

Hence median for given data = 49.5

**2. 133, 73, 89, 108, 94, 104, 94, 85, 100, 120**

**Solution:**

First we have to arrange given data into ascending order,

73, 85, 89, 94, 100, 104, 108, 120, 133

Given number of observations,  $n = 10$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 5<sup>th</sup> term + value of 6<sup>th</sup> term)/2

$$= (94 + 100)/2$$

$$= 97$$

Hence median for given data = 97

**3. 31, 38, 27, 28, 36, 25, 35, 40**

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**Solution:**

First we have to arrange given data into ascending order

25, 27, 28, 31, 35, 36, 38, 40

Given number of observations,  $n = 8$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of  $4^{\text{th}}$  term + value of  $5^{\text{th}}$  term)/2

$$= (31 + 35)/2$$

$$= 33$$

Hence median for given data = 33

**4. 15, 6, 16, 8, 22, 21, 9, 18, 25****Solution:**

First we have to arrange given data into ascending order

6, 8, 9, 15, 16, 18, 21, 22, 25

Given number of observations,  $n = 9$  (odd)

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of  $5^{\text{th}}$  term

$$= 16$$

**5. 41, 43, 127, 99, 71, 92, 71, 58, 57****Solution:**

First we have to arrange given data into ascending order

41, 43, 57, 58, 71, 71, 92, 99, 127

Given number of observations,  $n = 9$  (odd)

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>



Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 5<sup>th</sup> term

= 71

**6. 25, 34, 31, 23, 22, 26, 35, 29, 20, 32**

**Solution:**

First we have to arrange given data into ascending order,

20, 22, 23, 25, 26, 29, 31, 32, 34, 35

Given number of observations,  $n = 10$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 5<sup>th</sup> term + value of 6<sup>th</sup> term)/2

=  $(26 + 29)/2$

= 27.5

Hence median for given data = 27.5

**7. 12, 17, 3, 14, 5, 8, 7, 15**

**Solution:**

First we have to arrange given data into ascending order,

3, 5, 7, 8, 12, 14, 15, 17

Given number of observations,  $n = 8$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 4<sup>th</sup> term + value of 5<sup>th</sup> term)/2

=  $(8 + 12)/2$

= 10

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

Hence median for given data = 10

**8. 92, 35, 67, 85, 72, 81, 56, 51, 42, 69**

**Solution:**

First we have to arrange given data into ascending order,

35, 42, 51, 56, 67, 69, 72, 81, 85, 92

Given number of observations,  $n = 10$  (even)

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 5<sup>th</sup> term + value of 6<sup>th</sup> term)/2

$$= (67 + 69)/2$$

$$= 68$$

Hence median for given data = 68

**9. Numbers 50, 42, 35,  $2x + 10$ ,  $2x - 8$ , 12, 11, 8, 6 are written in descending order and their median is 25, find  $x$ .**

**Solution:**

Here, the number of observations  $n$  is 9.

Since  $n$  is odd, the median is the  $(n+1)/2$ th observation, i.e., the 5<sup>th</sup> observation.

As the numbers are arranged in the descending order, we therefore observe from the last.

Median = 5<sup>th</sup> observation.

$$\Rightarrow 25 = 2x - 8$$

$$\Rightarrow 2x = 25 + 8$$

$$\Rightarrow 2x = 33$$

$$\Rightarrow x = (33/2)$$

$$x = 16.5$$

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**10. Find the median of the following observations: 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, 33. If 92 is replaced by 99 and 41 by 43 in the above data, find the new median?**

**Solution:**

Arranging the given data in ascending order, we have:

33, 35, 41, 46, 55, 58, 64, 77, 87, 90, 92

Here, the number of observations  $n$  is 11 (odd).

Since the number of observations is odd, therefore,

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 5<sup>th</sup> term

= 58.

Hence, median = 58.

If 92 is replaced by 99 and 41 by 43, then the new observations arranged in ascending order are:

33, 35, 43, 46, 55, 58, 64, 77, 87, 90, 99

New median = Value of the 6<sup>th</sup> observation = 58.

**11. Find the median of the following data: 41, 43, 127, 99, 61, 92, 71, 58, 57, If 58 is replaced by 85, what will be the new median?**

**Solution:**

Arranging the given data in ascending order, we have:

41, 43, 57, 58, 61, 71, 92, 99, 127

Here, the number of observations,  $n$ , is 9(odd).

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 5<sup>th</sup> term

Hence, the median = 61.

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

If 58 is replaced by 85, then the new observations arranged in ascending order are:

41, 43, 57, 61, 71, 85, 92, 99, 12

New median = Value of the 5<sup>th</sup> observation = 71.

**12. The weights (in kg) of 15 students are: 31, 35, 27, 29, 32, 43, 37, 41, 34, 28, 36, 44, 45, 42, 30. Find the median. If the weight 44 kg is replaced by 46 kg and 27 kg by 25 kg, find the new median.**

**Solution:**

Arranging the given data in ascending order, we have:

27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 41, 42, 43, 44, 45

Here, the number of observations  $n$  is 15(odd).

Since the number of observations is odd, therefore,

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 8<sup>th</sup> term

Hence, median = 35 kg.

If 44 kg is replaced by 46 kg and 27 kg by 25 kg, then the new observations arranged in ascending order are:

25, 28, 29, 30, 31, 32, 34, 35, 36, 37, 41, 42, 43, 45, 46

$\therefore$  New median = Value of the 8<sup>th</sup> observation = 35 kg.

**13. 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**

**Solution:**

Here, the number of observations  $n$  is 10. Since  $n$  is even,

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

Median = (value of 5<sup>th</sup> term + value of 6<sup>th</sup> term)/2

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$63 = x + (x + 2)/2$$

$$63 = (2x + 2)/2$$

$$63 = 2(x + 1)/2$$

$$63 = x + 1$$

$$x = 63 - 1$$

$$x = 62$$

---

Exercise 23.4 Page No: 23.20

**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 mean.**

**Solution:**

Arranging the data in ascending order such that same numbers are put together, we get:

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

Here,  $n = 9$ .

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 5<sup>th</sup> term

Median = 14

Here, 14 occurs the maximum number of times, i.e., three times. Therefore, 14 is the mode of the data.

Now,

Mode = 3 Median – 2 Mean

14 = 3 x 14 – 2 Mean

2 Mean = 42 – 14 = 28

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$\text{Mean} = 28 \div 2$$

$$= 14.$$

**2. Find the median and mode of the data: 35, 32, 35, 42, 38, 32, 34**

**Solution:**

Arranging the data in ascending order such that same numbers are put together, we get:

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

Here,  $n = 7$

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 4<sup>th</sup> term

Median = 35

Here, 32 and 35, both occur twice. Therefore, 32 and 35 are the two modes.

**3. Find the mode of the data: 2, 6, 5, 3, 0, 3, 4, 3, 2, 4, 5, 2, 4**

**Solution:**

Arranging the data in ascending order such that same values are put together, we get:

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

Here, 2, 3 and 4 occur three times each. Therefore, 2, 3 and 4 are the three modes.

**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, mode and median of this data.**

**Solution:**

Arranging the data in ascending order such that same values are put together, we get:

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

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

Here,  $n = 11$

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 6<sup>th</sup> term

Median = 15

Here, 10 occur three times. Therefore, 10 is the mode of the given data.

Now,

Mode = 3 Median – 2 Mean

$10 = 3 \times 15 - 2 \text{ Mean}$

$2 \text{ Mean} = 45 - 10 = 35$

$\text{Mean} = 35 \div 2$

$= 17.5$

**5. 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 such that same values are put together, we get:

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

Here, clearly, 14 occurs the most number of times.

Therefore, 14 is the mode of the given data.

**6. 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, 164, 163, 160, 165, 163, 162**

**What is the mode of heights?**

**Also, find the mean and median.**

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

**Solution:**

Arranging the data in tabular form, we get:

Height of Children (cm )	Tally marks	Frequenc y
160		3
161		1
162		4
163		10
164		3
165		3
168		1
Total		25

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 13<sup>th</sup> term

Median = 163 cm

Here, clearly, 163 cm occurs the most number of times. Therefore, the mode of the given data is 163 cm.

Mode = 3 Median – 2 Mean

163 = 3 x 163 – 2 Mean

2 Mean = 326

Mean = 163 cm.

**7. The scores in mathematics test (out of 25) of 15 students are as follows:**

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

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>



**Find the mode and median of this data. Are they same?**

**Solution:**

Arranging the data in ascending order such that same values are put together, we get:

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

Here,  $n = 15$

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 8<sup>th</sup> term

Median = 20

Here, clearly, 20 occurs most number of times, i.e., 4 times. Therefore, the mode of the given data is 20.

Yes, the median and mode of the given data are the same.

**8. Calculate the mean and median for the following data:**

	10	11	12	13	14	16	19	20
<b>Marks</b>								
<b>Number of students</b>	3	5	4	5	2	3	2	1

**Using empirical formula, find its mode.**

**Solution:**

Calculation of mean

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

$$= 332/25$$

$$= 13.28$$

Here,  $n = 25$ , which is an odd number. Therefore,

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

Therefore median =  $((n+1)/2)^{\text{th}}$  term

Median = value of 13<sup>th</sup> term

Median = 13

Now, by using empirical formula we have,

Mode = 3Median – 2 Mean

Mode = 3 (13) – 2 (13.28)

Mode = 39 – 26.56

Mode = 12.44.

**9. The following table shows the weights of 12 persons.**

	48	50	52	54	58
<b>Weight (in kg)</b>					
<b>Number of persons</b>	4	3	2	2	1

**Find the median and mean weights. Using empirical relation, calculate its mode.**

**Solution:**

$x_i$	$f_i$	$x_i f_i$
48	4	192
50	3	150
52	2	104
54	2	108
58	1	58

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

$$\text{Total } \sum f_i = 12 \quad \sum f_i x_i = 612$$

Calculation of mean

$$\text{Mean} = \sum f_i x_i / \sum f_i$$

$$= 612/12$$

$$= 51 \text{ kg}$$

Here  $n = 12$

Therefore median =  $(n/2)^{\text{th}}$  term +  $((n + 1)/2)^{\text{th}}$  term

$$\text{Median} = (\text{value of } 6^{\text{th}} \text{ term} + \text{value of } 7^{\text{th}} \text{ term})/2$$

$$= (50 + 50)/2$$

$$= 50$$

Now by empirical formula we have,

Now,

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

$$\text{Mode} = 3 \times 50 - 2 \times 51$$

$$\text{Mode} = 150 - 102$$

$$\text{Mode} = 48 \text{ kg.}$$

Thus, Mean = 51 kg, Median = 50 kg and Mode = 48 kg.



<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

# Chapterwise RD Sharma

## Solutions for Class 7 Maths :

- Chapter 1–Integers
- Chapter 2–Fractions
- Chapter 3–Decimals
- Chapter 4–Rational Numbers
- Chapter 5–Operations On Rational Numbers
- Chapter 6–Exponents
- Chapter 7–Algebraic Expressions
- Chapter 8–Linear Equations in One Variable
- Chapter 9–Ratio And Proportion
- Chapter 10–Unitary Method
- Chapter 11–Percentage
- Chapter 12–Profit And Loss
- Chapter 13–Simple Interest
- Chapter 14–Lines And Angles
- Chapter 15–Properties of Triangles
- Chapter 16–Congruence
- Chapter 17–Constructions
- Chapter 18–Symmetry
- Chapter 19–Visualising Solid Shapes
- Chapter 20–Mensuration - I (Perimeter and area of rectilinear figures)
- Chapter 21–Mensuration - II (Area of Circle)
- Chapter 22–Data Handling - I (Collection and Organisation of Data)
- Chapter 23–Data Handling - II Central Values
- Chapter 24–Data Handling - III (Constructions of Bar Graphs)
- Chapter 25–Data Handling - IV (Probability)

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>

# About RD Sharma

*RD Sharma isn't the kind of author you'd bump into at lit fests. But his bestselling books have helped many CBSE students lose their dread of maths. Sunday Times profiles the tutor turned internet star*

He dreams of algorithms that would give most people nightmares. And, spends every waking hour thinking of ways to explain concepts like 'series solution of linear differential equations'. Meet Dr Ravi Dutt Sharma — mathematics teacher and author of 25 reference books — whose name evokes as much awe as the subject he teaches. And though students have used his thick tomes for the last 31 years to ace the dreaded maths exam, it's only recently that a spoof video turned the tutor into a YouTube star.

R D Sharma had a good laugh but said he shared little with his on-screen persona except for the love for maths. "I like to spend all my time thinking and writing about maths problems. I find it relaxing," he says. When he is not writing books explaining mathematical concepts for classes 6 to 12 and engineering students, Sharma is busy dispensing his duty as vice-principal and head of department of science and humanities at Delhi government's Guru Nanak Dev Institute of Technology.

<https://www.indcareer.com/schools/rd-sharma-solutions-for-class-7-maths-chapter-23-data-handling-ii-central-values/>