



## MATHS

### BOOKS - NAGEEN PRAKASHAN ENGLISH

## STATISTICS

#### Example Type

1. Find the mean deviation using arithmetic mean of the following data:

16,22,26,14,12,15,13,18,



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2. Find the deviation using median of the following observations:

15,19,20,28,16.

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3. Find the mean deviation using arithmetic mean from the following observations:

$x_i$	5	15	25	35	45
$f_i$	5	6	15	16	6.

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4. Find the mean deviation using median from the following data:

<b>Term</b>	10	20	30	40	50	60	70	80
<b>frequency</b>	10	15	20	50	40	30	20	10.

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5. Find the mean deviation using arithmetic mean from the following table:

<b>Class-interval</b>	0-10	10-20	20-30	30-40	40-50
<b>Frequency</b>	5	6	15	16	6

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6. Find the mean deviation using median:

<b>Class-interval</b>	0-10	10-20	20-30	30-40	40-50
<b>Frequency</b>	5	12	20	9	4

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7. Find the mean deviation by short cut method.

<b>Class-interval</b>	<b>Frequency</b>
10-20	2
20-30	3
30-40	8
40-50	14
50-60	8
60-70	3
70-80	2

*Solution*

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8. Find the standard deviation of 8,11,14,17,20,23,26.

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9. Find the variance and standard deviation from the following data:

$x_i$	2	4	6	8	10
$f_i$	7	5	7	3	2

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10. Find the standard deviation from the following observations:

15,18,13,20,17,10,16,19,22,20.

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11. Find the standard deviation from the following data:

$x_i$	1	2	3	4	5
$f_i$	16	21	10	7	8

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12. Find the standard deviation by using 20 as assumed mean.

<b>Class-interval</b>	0-10	10-20	20-30	30-40	40-50
<b>Frequency</b>	3	6	13	10	5

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13. The arithmetic means of two distributions are 10 and 15 and their S.D. are 2 and 2.5 respectively. Find their coefficient of variation.

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14. The mean and S.D. of the income of the employers of two banks are as follows:

Bank	Mean income (in ₹)	S.D. (in ₹)
A	3200	160
B	3500	140

Compare the coefficient of variation of the income of the employees of the two banks.

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## Exercise

1. Find the mean deviation using arithmetic mean for the following observations:

(a) 68,32,49,54,21,38,59,41,66,76

(b) 28,12,17,35,22,18,5,32



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2. Find the mean deviation using median for the following observations:

(a) 17,25,9,12,18,26,21

(b) 6,10,11,15,9,7,15,16,5



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3. Find the mean deviation using arithmetic mean for the following

(a)

$x_i$	10	20	30	40	50
$f_i$	1	2	3	3	1

(b)

$x_i$	10	15	20	30	40	50
$f_i$	8	12	15	10	3	2

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4. Find the mean deviation using median for the following datas:

(a)

$x_i$	13	14	15	16	17	18	19	20
$f_i$	1	2	3	4	5	4	3	2

(b)

$x_i$	21	22	23	24	25	26	27	28	29	30
$f_i$	7	9	8	5	6	4	4	3	0	1

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5. Find the standard deviation from the following datas:

(a) 

$x_i$	0	2	4	6	8	10
$f_i$	3	2	5	6	3	1

(b) 

$x_i$	6	7	8	9	10	11	12
$f_i$	3	6	9	13	8	7	4

(c) 

$x_i$	5	10	15	20	25
$f_i$	5	6	12	16	11

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6. Find the standard deviation from the following datas, using assumed mean:

(a) 112,117,121,125,130

(b) 37,43,48,34,41,39,46,40

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7. Find the standard deviation from the following datas, using assumed mean:

(a)

$x_i$	8	12	16	20	24	28
$f_i$	9	11	17	14	6	3

(b)

$x_i$	5	10	15	20	25	30	35	40
$f_i$	12	17	24	21	14	6	4	2

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8. Find the standard deviation from the following datas, using assumed mean:

(a)

Class-interval	Frequency
10-30	7
30-50	11
50-70	12
70-90	6
90-110	14

(b)

Class-interval	Frequency
18-24	13
24-30	18
30-36	26
36-42	15
42-48	11
48-54	7

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9. The mean and variance of 5 observations are respectively 4.4 and 8.24. If three observations are 1, 2 and 4 then find the remaining two observations.



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**10.** The mean and variance of 8 observations are respectively 9 and 9.25. If six observations are 4,6,7,8,12 and 13 then find the remaining two observations.

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**11.** The mean and standard deviation of 100 observations were calculated as 40 and 5.1 respectively by a student who took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

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**12.** The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases. (i) If

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**13.** Calculate the mean and standard deviation of first  $n$  natural numbers.

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**14.** Calculate the mean and standard deviation of first natural numbers.



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15. Find out the standard deviation from the following distribution table:

Class-interval	0-10	10-20	20-30	30-40	40-50
Frequency	6	9	12	8	15



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16. If the coefficients of variations for two distributions are 40 and 50 and their S.D. are 16 and 25 respectively. Find their means.



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17. Find which group is more variable:

2. Find which group is more variable :

Class-interval	Group A	Group B
0-10	15	18
10-20	17	20
20-30	22	24
30-40	18	22
40-50	14	17
50-60	10	12
60-70	4	7

3. The arithmetic means of two distributions are 20 and 30

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18. The arithmetic means of two distributions are 20 and 35 and their S.D. are 5 and 7 respectively. Find their coefficient of variation.

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19. Find which group is more variable:

4. Find which group is more variable :

Class-interval	Group X	Group Y
0-5	6	4
5-10	12	8
10-15	17	15
15-20	13	11
20-25	9	8
25-30	3	4

the following table, the mean and S.D. of the

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20. In the following table, the mean and S.D. of the income of the employees of two factories are given. Find the variability of their average income.

Factory	Mean (in ₹)	S.D. (in ₹)
P	1200	150
Q	1600	160

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## Ncert Questions

1. Find the mean deviation about the mean for the data :  
4, 7, 8, 9, 10, 12, 13, 17

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2. Calculate the mean deviation from the mean for the  
following data: 39, 70, 48, 42, 55, 63, 46, 54, 44

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3. Find the mean deviation about the median for the data :

13, 17, 16, 14, 11, 13, 10, 16, 11, 18, 12, 17

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4. Find the mean deviation about the median for the data :

36, 72, 46, 42, 60, 45, 53, 46, 51, 49

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5. Find the mean , mean deviation about the mean , variance and standard deviation for the following data

$x_i$	5	10	15	20	25
$f_i$	7	4	6	3	5

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6. Find the mean deviation about the mean for the data is

Question:

$x_i$	10	30	50	70	90
$f_i$	4	24	28	16	8

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7. Find the mean deviation about the median for the data in

Question

$x_i$	5	7	9	10	12	15
$f_i$	8	6	2	2	2	6

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8. Find the mean deviation from the median for the following data:

$x_i$	15	21	27	30	35
$f_i$	3	5	6	7	8

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9. Find the mean deviation about the mean for the data in

Question:

Income per day	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800
Number of persons	4	8	9	10	7	5	4	3

Solution :

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10. Find the mean deviation about the mean for the data in

Question:

Question 10.

Height (in cm)	95-105	105-115	115-125	125-135	135-145	145-155
Number of boys	9	13	26	30	12	10

Solution :

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11. Find the mean deviation about median for the following

data:

Question 11. Find the mean deviation about median for the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Number of girls	6	8	14	16	4	2

Solution :

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12. Calculate the mean deviation about median age for the age distribution of 100 persons given below:

Age in years	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55
Number	5	6	12	14	26	12	16	9

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13. Find the mean variance and standard deviation for the following data: 6,7,10,12,13,4,8,12

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14. Find the mean and variance for each of the data : First  $n$  natural numbers

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15. Find the mean and variance for each of the data : First 10 multiples of 3.

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16. Find the mean and variance for each of the data in

Question:

$x_i$	6	10	14	18	24	28	30
$f_i$	2	4	7	12	8	4	3



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17. Find the mean and variance for each of the data in

Question:

$x_i$	92	93	97	98	102	104	109
$f_i$	3	2	3	2	6	3	3



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18. Find the mean and standard deviation using short cut method

$x_i$	60	61	62	63	64	65	66	67	68
$f_i$	2	1	12	29	25	12	10	4	5



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19. Find the mean and variance for the following frequency distributions in

Question 7 :

Classes	0-30	30-60	60-90	90-120	120-150	150-180	180-210
Frequencies	2	3	5	10	3	5	2

Solution :

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20. Find the mean and variance for the following frequency distributions in

Classes	0-10	10-20	20-30	30-40	40-50
Frequencies	5	8	15	16	6

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21. Find the mean variance and standard deviation using short-cut method

Height (in cm)	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115
No. of children	3	4	7	7	15	9	6	6	3

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22. The diameter of circles (in mm) drawn in a design are given below:

Diameters	33-36	37-40	41-44	45-48	49-52
No. of circles	15	17	21	22	25

Calculate the standard deviation and mean diameter of the circles.

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**23.** From the data given below state which group is more variable A or B?

Marks	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Group A	9	17	32	33	40	10	6
Group B	10	20	30	25	43	15	7

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**24.** From the prices of shares X and Y below, find out which is more stable in value X 35 54 52 53 56 58 52 50 51 49 . Y 108 107 105 105 106 107 104 103 104 101

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25. An analysis of monthly wages paid to workers in two firms A and B, belonging to the same industry, gives the following results:

	Firm A	Firm B
No. of wage earners	586	648
Mean of monthly wages	₹ 5253	₹ 5253
Variance of the distribution	100	121 of wages

- (i) Which firm A or B pays larger amount as monthly wages?
- (ii) Which firm A or B shows greater variability in individual wages?

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26. The following is the record of goals scored by team A in a football session. For the team B, mean number of goals

scored per match was 2 with a standard deviation 1.25 goals.

Find which team may be considered more consistent?



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27. The sum and sum of squares corresponding to length  $x$  (in cm) and weight  $y$  (in gm) of 50 plant products are given

below

:

$$\sum_{i=1}^{50} x_i = 212, \sum_{i=1}^{50} x_i^2 = 902.8, \sum_{i=1}^{50} y_i = 261, \sum_{i=1}^{50} y_i^2 = 1457.6$$

Which is more varying the length or weight?



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Miscellaneous Exercise

1. The mean and variance of eight observations are 9 and 9.25, respectively. If six of the observations are 6, 7, 10, 12, 12 and 13, find the remaining two observations.

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2. The mean and variance of 7 observations are 8 and 16, respectively. If five of the observations are 2, 4, 10, 12, 14. Find the remaining two observations.

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3. The mean and standard deviation of six observations are 8 and 4, respectively. If each observation is multiplied by 3, find

the new mean and new standard deviation of the resulting observations.

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4. Given that  $\bar{x}$  is the mean and  $\sigma^2$  is the variance of  $n$  observations  $x_1, x_2, \dots, x_n$ . Prove that the mean and variance of the observations  $ax_1, ax_2, ax_3, \dots, ax_n$  are  $a\bar{x}$  and  $a^2\sigma^2$ , respectively, ( $a \neq 0$ )

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5. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. One rechecking, it was

found that an observation 8 was incorrect. Calculate the correct mean and standard deviation in each of the following cases. (i) If wrong item is omitted (ii) If it is replaced by 12.

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6. The mean and standard deviation of marks obtained by 50 students of a class in three subjects, Mathematics, Physics and Chemistry are given below:

Subject	Mathematics	Physics	Chemistry
Mean	42	32	40.9
Standard deviation	12	15	20

Which of the three subjects shows the highest variability in marks and which shows the lowest?

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7. The mean and standard deviation of a group of 100 observations were found to be 20 and 3, respectively. Later on it was found that three observations were incorrect, which are recorded as 21, 21 and 18. Find the mean and standard deviation if the



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