MATHS

BOOKS - CALCUTTA BOOK HOUSE MATHS (BENGALI ENGLISH)

MEASURES OF CENTRAL TENDENCY

Example

1. Let a business-man have sold rice of 15 quintal , 19 quintal and 20 quintal in three consecutive months. Then how many quintal of rice had he sold per month as a average ?

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2. Let the velocity of a bicycler in 10 consecutive hours are 17,25,30,32,28,24,20,18,16,10 in kilometers.Find the average velocity.

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3. The marks obtained by 41 students in an examination in Math are given below:

15	23	16	10	48	50	12	8	42
25	17	22	2	27	35	17	17	
32	40	26	31	25	32	24	20	
5	38	23	45	21	23	25	22	
21	12	28	21	29	27	28	31	

Find the average of the marks obtained by them.

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4. The selling amount of money of a shopkeeper in 7 days of any week are given below (in rupees). 115,98, 102,126,85,91,107

Find the average of the amount of rupees sold per day.

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5. let a person bought 2 sharees of price Rs. 30 each, 3 sharees of price Rs. 35 each and 5 sharees of price Rs. 45 each. What is the average price of the sharees ?

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6. In a telephone exchange , the frequency distribution of the number of telephone calls per minute for any hour are given below :

Number of Telephone calls	Frequencies
0	2
1	5
2	6
3	11
4	12
5	10
6	8
7	5
8	1
Total	60

find the average number of telephone calls.

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7. The average weight of the following frequency distribution is 117 Kg.

Weight (in kg)	:	100	110	120	W	140
No. of person	:	1	4	2	2	1

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8. In a shop there are 150 balls of 5 kinds of different radius . The frequency distribution of their diameters are as follows :

Diameter (in mm)	Frequencies
45	25
46	28
47	32
48	35
49	30
Total	150

Find the average diameter of the balls.

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9. The frequency distribution of the heights (in cm) of 100 students of class X in a school .Find the average height of the students .

Class-interval of heights (in cm.)	Frequencies
140—144	1
145—149	3
150—154	7
155—159	22
160—164	30
165—169	24
170—174	8
175—179	3
180—184	2
Total	100

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10. The frequency distribution of the marks obtained by 76 students in a math. Find the average of marks obtained .

Numbers obtained	$1-10$	$11-20$	$21-30$	$31-40$	$41-50$	Total
Frequncies	4	14	32	18	8	76

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11. The arithmetic mean of the temperatures in centigrade scale of seven different days is $32.5^{\circ}C$. What will be the arithmetic mean in Fahrenheit scale ?

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12. The arithmetic means of the marks obtained by the students of a school in English and Bengali are 40.25 and 48.50 respectively . Find the averages of the sums of the marks obtained in English and Bengali.

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13. There are 25 boy students and 20 girls students in a school. The average of marks in math of 25 boy students is 52 and the average of marks in math of 20 girl-students is 48. Find the average of marks obtained by the students of the school as a whole.

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14. Find the geometric mean of the following number : 18,40,25 and 45.

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15. A train travels first 30 miles at a speed of 15 miles/hour and the next 30 miles at a speed of 30 miles/hour . Find the average velocity of the train.

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16. A shop keeper bougth rice of Rs. 30 at a rate of Rs. 1.5 per kg and of Rs. 30 at a rate of Rs. 4 per kg. Then what is the value of mixed rice per kg ?

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17. The frequency distritubution of the monthly salaries of 80 workers of a company are given below. Find the arithmetic mean of the salaries of the workers

Salary (in Rupees) Class- intervals	Frequencies
101–200	30
201–300	16
301–500	19
501–1000	10
1001–2500	5
Total	80

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18. There are two groups A and B in a shop . In the group A, 50 toys have been sold the average price of each toy being Rs. 15 . In group B there also have been sold 30 toys, the average price of which is Rs. 20 each . Find the average of average selling price of the total 80 toys sold in the shop.

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19. The frequency distribution of the degre of the drugs of 110 patients to be cured are given below : Here the number of patients being cured by taking 20 tablets and the number of patients being cured by taking 32 tablets are unknown. But it is known that the number of tablets required to be cured per patient is 20 tablets. Find the two unknown frequencies.

Number of Tablets	Frequencies
4	11
8	13
12	16
16	14
20	—
24	9
28	17
32	—
36	6
40	4
Total	110

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20. The frequency distributions of the weekly wages of some labourers of an industry are given below :

Weekly wages (in Rupees)	Frequencies
15	2
20	22
25	–
30	14
35	4
40	4
45	3
50	3

The number of labourers having Rs. 25 weekly wages is unknown. But it is known that the average weekly wages of a labourer is Rs. 27.50 . Find the unknown frequency .

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21. In a business hourse, the weekly salaries of 30 employees are given below :

129	123	104	132	144	88
108	106	123	148	103	100
134	85	61	69	99	114
140	80	142	63	77	126
133	95	118	148	62	139

The rate of bonus of that house are given in the following table :

Weekly Salaries (in Rupees)	Rate of bonus (in Rupees)
61–75	50
76–90	75
91–105	100
106–120	125
121–135	150
136–150	175

Find the arithmetic mean of the bonus of the employees.

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22. There are 50 workers in a small industry. The dialy income of them is Rs. 9 Amongst them, the daily income of the 30 workers, working in the morning is Rs. 8 . Then find the daily average income of workers working in the evening.

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23. Find the day of average absence of each and every student from the following given table :

Absence	Number of students
Less than 5 days	29
Less than 10 days	224
Less than 15 days	465
Less than 20 days	582
Less than 25 days	630

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24. The arithmetic mean of 200 values of a variable is 50. Later on, it is found that two values 92 and 8 have been taken wrongly instead of 192 and 88 respectively . After correction , find the actual arithmetic mean of the given values.

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25. The average of the weights of 150 students is 50 kilogram. The average of the weights of the boy students is 55 kilograms and the average of the weigths of the girls students is 42.5 kilogram . Find the number of boy and girl students.

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26. If a and b are two positive numbers, then prove that $A.M. \geq G.M. \geq H.M.$

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27. The AM of two positive is 25 and their GM is 15. Find the two numbers.

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Exercise

1. How arithmetic mean is changed when the values of the variable are added or subtracted by a constant number ?

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2. How AM, GM and HM of the values of a variable are changed when the values are divided by a constant .

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3. Find the average of first n-natural numbers.

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4. What is the algebraic sum of the deviations of the values of a variable from their average ? Explain with an example.

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5. If two positive values of a variable be x_1 and x_2 and the arithmetic mean be A, geometric mean be G and the harmonic mean be H, then prove that $G^2 = AH$

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6. Find the average of the variable.

The incomes of three friends are :Rs. 325, Rs. 927 and Rs. 630.

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7. Find the average of the variable.

The diameters of five pipes are : $13\frac{3}{4}$ mm, $11\frac{7}{16}$mm , $6\frac{1}{2}$mm , $7\frac{3}{4}$mm

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8. Find the average of the variable.

The selling prices of seven days of a shopkeeper are : Rs. 107.00 , Rs. 210.24 , Rs. 90.06 , Rs 51.20 , Rs. 112.75 , Rs. 75.95 and Rs. 195.50.

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9. In the following table the prices of salt per quintal of secen days of a market in Kolkata are given . Find the arithmetic mean of the table by transferring the origin at 300.

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Price of salt per Q.	300·50	305·25	310·75	302·50	301·20	299·95	300·00

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10. The marks obtained by 30 students in a examination of a class are given below . Find their average.

71	88	90	87	90
83	71	92	88	89
88	72	90	81	92
75	83	72	90	88
82	90	76	80	89

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11. The frequency distribution of the family members of 65 families are given below. Find the arithmetic mean.

Member of family	Frequency
1	3
2	9
3	12
4	16
5	13
6	7
7	3
8	2
Total	65

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12. The weights (in Kg) and their frequency distribution of 100 students are given below. Find their arithmetic mean.

Weight (in kg)	No. of students
43	2
44	3
45	4
46	5
47	10
48	18
49	17
50	15
51	14
52	8
53	4
Total	100

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13. The frequency distribution of the number of accidents in 30 consecutive days in a city are given below. Find the arithmetic mean.

No. of accidents	No. of days
1	8
2	6
3	11
4	2
5	2
6	1
Total	30

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14. The frequency distribution of the diameters (in mm) of 80 pipes are given below. Find their arithmetic mean, assuming 22 as the origin.

Diameters (in mm)	Frequencies
18	2
19	4
20	10
21	15
22	25
23	13
24	7
25	3
26	1
Total	80

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15. Find the average of the numbers from the given frequency distribution :

Class-intervals	Frequencies
48–52	2
53–57	4
58–62	6
63–67	11
68–72	24
73–77	37
78–82	19
83–87	12
88–92	6
93–97	4
Total	125

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16. The frequency distributions of the quantity (in quintals) of producing cokes from a coke mine in 100 days are given below. Find the arithmetic

mean.

Weights (in quintal)	Frequencies
94–97	2
98–101	5
102–105	12
106–109	14
110–113	30
114–117	20
118–121	10
122–125	7
Total	100

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17. The frequency distribution of the monthly incomes (in rupees) of the workers of a small industry are given below. Find the average of their

incomes .

Incomes (in rupees)	Frequency
200–224	145
225–249	322
250–274	525
275–299	275
300–324	225
325–349	105
Total	1,597

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18. The average of weights (in kg) and the number of students of a school of given below. Find their collective average.

Students	Numbers	Average of weights
Boy students	245	42·5 kg
Girl students	125	38·2 kg

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19. The arithmetic mean of the marks obtained in 8 different subjects in a school are given below. Find the average of the sum of the marks of 8 subjects.

Subjects	1	2	3	4	5	6	7	8
Average of nos.	40·5	42·7	52·6	60·2	38·5	43·5	65·5	49·6

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20. The average of the collective ages of 4 classes in a school is 8.5 years. The number of students of 4 classes are 32.30, 29 and 27. If the average of the classes of the first, second and third be 6.8 years, 7.5 years and 8.2 years respectively , then find the average of ages of the students of class-IV.

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21. If the average temperature of a place be 105.5° F in Fahrenheit scale. What is the average of the same in centigrade scale.

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22. Donations (in rupees) are given for a fare by the 100 students of a school. In the following table rate of donation and the number of students are given.

Rate of Donation (in rupees)	Number of students
2·50	10
1·00	21
x	24
2·00	15
0·50	30

In the above data, the rate of donation of 24 students is unknown , but it is known to us that the average rate of donation is Rs. 1.27 . Find teh unknown frequency.

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23. Find the average height of the students from the given table.

Heights of the students (in cm)	Number of students
Less than 145	0
Less than 150	2
Less than 155	7
Less than 160	16
Less than 165	31
Less than 170	47
Less than 175	54
Less than 180	59
Less than 185	60

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24. Find the average income (in rupees) of the workers from the following table :

Weekly income (in rupees)	Number of workers
More than 0	65
More than 15	50
More than 30	42
More than 45	37
More than 60	30
More than 75	25
More than 90	10
More than 105	0

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25. The frequency distribution of the marks obtained in a school is given below. In the table, the number of students who obtained marks from 31 to 40 , is unknown . But it is known that the average of total work

obtained by the students is 42.85. Find the lost frequency.

Class-intervals of Nos.	Frequencies
11–20	42
21–30	38
31–40	f
41–50	84
51–60	48
61–70	36
71–80	32

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26. Part of the weekly expenditure of 1000 families is given in the following frequency distrution table. If the average of weekly expenditure be Rs. 87.50 , find the lost frequency.

Weekly expenditure (in rupees)	Number of Families
40–59	50
60–79	?
80–99	500
100–119	?
120–139	50
Total	1000

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27. Average monthly income of 50 persons is Rs 270.00 . Later on it is found that the income of a person, which is correctly Rs. 243, but wrongly taken as Rs. 213 . Find the correct average.

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28. The monthly salaries of 20 employees of a commercial enterprise are given below :

130	145	125	151	110
65	100	71	80	132
62	118	76	142	98
116	103	85	122	95

This enterprise gives bonus at the following rate :

Salaries (in rupees)	Rate of bonus (in rupees)
80 and less than 80	100
81 and less than 120	120
More than 120	140

Find the average of the rate of bonus of each employee.

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29. The number of students in a class is 60 . The average of the ages of the boy-students is 14.5 years and the average of the ages of the girl-students is 16 years . If the collective average of the total students be 15 years , then find the number of boy-students and the number of girl-students.

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30. The arithmetic mean of two numbers is 10 and their geometric mean is 8. find the numbers.

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31. Find the geometric mean of the $2\frac{2}{7}, 3, 1\frac{3}{4}$ and $1\frac{1}{3}$

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32. Find the geometric mean of the $45, 20, 12, 75$ and 30

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33. If the arithmetic mean of two numbers be 10 and their harmonic mean is 7.5 , then what are two numbers ?

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34. A person have to go 4 kilometers away from a city. He has to go 2 kilometers by bus and the rest path by walking . If the velocity of the bus be 40 km/hour and the velocity of his walking be 4 km/hour , then find the average velocity of the at person.

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35. While ascending a mountain, a car go 8 kilometre consuming one litre of petrol and during the descending , it can go 12 kilometres consuming one litre of petrol. How many kilometers the car will go in a

average per litre of petrol after ascending and then descending the mountain ?

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36. The average weight of the following frequency distribution is 58.5 kilogram :

Weights (in kg)	Number of persons
80	1
55	4
60	2
$x + 12{\cdot}5$	2
70	1
	Total = 10

Find the value of x .

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