MATHS

NCERT - NCERT MATHS (GUJARATI ENGLISH)

STATISTICS

Examples

1. The marks obtained in mathematics by 30 students of Class X of a certain scholl are

given in table the below. Find the mean of the marks obtained by the students.

Marks obtained (x_i)	10	20	36	40	50	56	60	70	72	80	88	92	95
Number of student (f_i)	1	1	3	4	3	2	4	4	1	1	2	3	1

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2. The table below gives the percentage distribution of female teachers in the primary schools of rural areas of various states and union territories (U.T) of India. Find the mean percentage of female teachers using all the

three methods.

Percentage of female teachers	15-25	25-35	35–45	45-55	55-65	65-75	75–85
Number of States/U.T.	6	11	7	4	4	2	1

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3. The below distribution shows the numbers of wickets taken by bowkers in one-day cricket matches. Find the mean number of wickets by choosing a suitable method. What does the mean signify ?

Number of wickets	20 - 60	60 - 100	100 - 150	150 - 250	250 - 350	350 – 450
Number of bowlers	7	5	16	12	2	3

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4. The wickets taken by a bowler in 10 cricket matches are as follows: 2,6,4,5,0,2,1,3,2,3. Find the mode of the data.

5. A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a household.

Family size	1-3	3-5	5-7	7-9	9-11
Number of families	7	8	2	2	1

Find the mode of this data.

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6. The marks distribution of 30 students in a mathematics examination are given in the adjacent table. Find the mode of this data. Also compare and interpret the mode and the

mean .

Class interval	Number of students (f_i)	Class Marks (x_i)	$f_i x_i$
10-25	2	17.5	35.0
25-40	3	32.5	97.5
40-55	7	47.5	332.5
55-70	6	62.5	375.0
70-85	6	77.5	465.0
85-100	6	92.5	555.0
Total	$\sum f_i = 30$		$\sum f_i x_i = 1860.0$

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7. A survey regarding the heights (in cm) of 51 girls of Class X of a school was conducted and data was obtained as shown in table. Find

their median.

Height (in cm)	Number of girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

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8. The median of the following data is 525. Find the values of x and y , if the total

frequency is 100. Here, CI stands for class interval and Fr for frequency.

CI	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Fr	2	5	x	12	17	20	y	9	7	4

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9. The annual profits earned by 30 shops in Sangareddy locality give rise to the following distribution :

Profit (in lakhs)	Number of shops (frequency)
More than or equal to 5	30
More than or equal to 10	28
More than or equal to 15	16
More than or equal to 20	14
More than or equal to 25	10
More than or equal to 30	7
More than or equal to 35	3

Draw both ogives for the data above. Hence obtain the median profit.

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Exercise 14 1

1. A survey conducted by a group of students as a part of their environment awareness

programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

છોડની સંખ્યા	0-2	2-4	4-6	6-8	8-10	10-12	12-14
ઘરોની સંખ્યા	1	2	1	5	6	2	3

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2. Consider the following distribution of daily wages of 50 workers of a factory.

દૈનિક વેતન (₹ માં)	500-520	520-540	540-560	560-580	580-600
કારીગરોની સંખ્યા	12	14	08	06	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

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3. The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is Rs 18. Find the missing frequency f.

દૈનિક ખિસ્સાભથ્થું (₹ માં)	11-13	13-15	15-17	17-19	19-21	21-23	23-25
બાળકોની સંખ્યા	7	6	9	13	f	5	4

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4. Thirty women were examined in a hospital by a doctor and their heart beats per minute were recorded and summarised as shown . Find the mean heart beats per minute for these women, choosing a suitable method.

પ્રતિ મિનિટ હૃદયના ધબકારાની સંખ્યા	65-68	68-71	71-74	74-77	77-80	80-83	83-86
મહિલાઓની સંખ્યા	2	4	3	8	7	4	2

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5. In a retail market, fruit vendors were selling oranges kept in packing baskets. These

contained varying number of oranges. The following was the distribution of oranges.

કેરીઓની સંખ્યા	50-52	53-55	56-58	59-61	62-64
ખોખાંઓની સંખ્યા	15	110	135	115	25

Find the mean number of oranges kept in each basket. Which method of finding the mean did you choose ?

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6. The table below the daily expenditure on food of 25 household in a locality.

દૈનિક ખર્ચ (₹ માં)	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
પરિવારોની સંખ્યા	4	5	12	2	2

Find the mean dialy expenditure on a food by a suitable method.

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7. To find out the concentration of SO_2 in the air (in parts per million, i.e, ppm), the data was collected for 30 localities in a certain city and is presented below :

SO_2ની સાંદ્રતા (ppm માં)	આવૃત્તિ
0.00 - 0.04	4
0.04 - 0.08	9
0.08 - 0.12	9
0.12 - 0.16	2
0.16 - 0.20	4
0.20 - 0.24	2

Find the mean concentration of SO_2 in the air.

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8. A class teacher has the following attendence record of 40 students of a class for the whole term. Find the mean number of days a student

was present out of 56 days in the term.

ગેરહાજર દિવસોની સંખ્યા	0 - 6	6 - 10	10 - 14	14 - 20	20 - 28	28 - 38	38 - 40
વિદ્યાર્થીઓની સંખ્યા	11	10	7	4	4	3	1

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9. The following table gives the literacy rate (in percentage) of 35 cities. Find the mean literacy rate.

સાક્ષરતા દર (ટકા માં)	45 - 55	55 - 65	65 - 75	75 - 85	85 - 95
શહેરોની સંખ્યા	3	10	11	8	3

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Exercise 14 2

1. The following table shows the ages of the patients admitted in a hospital on a particular day :

ઉંમર (વર્ષમાં)	5 - 15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65
દર્દીઓની સંખ્યા	6	11	21	23	14	5

Find the mode and the mean of the data given below. Compare and interpret the two measures of central tendency.

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2. The following data gives the information on the observed life times (in hours) of 225 electrical components:

આયુષ્ય (કલાકોમાં)	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120
આવૃત્તિ	10	35	52	61	38	29

Determine the modal lifetimes of the components.

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3. The following data gives the distribution of total monthly household expenditure of 200

families of Gummadidala village. Find the modal monthly expenditure of the families. Also, find the mean monthly expenditure.

માસિક ખર્ચ (₹ માં)	કુટુંબોની સંખ્યા
1000 - 1500	24
1500 - 2000	40
2000 - 2500	33
2500 - 3000	28
3000 - 3500	30
3500 - 4000	22
4000 - 4500	16
4500 - 5000	7

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4. The following distribution distribution given the state-wise, teacher-student ratio in higher secondary schools of India. Find the mode and mean of this data. Interpret the two measures.

પ્રતિ શિક્ષક વિદ્યાર્થીઓની સંખ્યા	રાજ્યો/કેન્દ્ર શાસિત પ્રદેશોની સંખ્યા
15 - 20	3
20 - 25	8
25 - 30	9
30 - 35	10
35 - 40	3
40 - 45	0
45 - 50	0
50 - 55	2

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5. The given distribution shows the number of runs scored by some top batsmen of the world in one-day international cricket matches.

નોંધાવેલ રન	બેટ્સમેનોની સંખ્યા
3000 - 4000	4
4000 - 5000	18
5000 - 6000	9
6000 - 7000	7
7000 - 8000	6
8000 - 9000	3
9000 - 10000	1
10000 - 11000	1

Find the mode of the data.

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6. A student noted the number of cars passing thorugh a spot on a road for 100 periods, each of 3 minutes, and summarised this in the table given below.

ગાડીઓની સંખ્યા	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
આવૃત્તિ	7	14	13	12	20	11	15	8

Find the mode of the data.

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Exercise 14 3

1. The following frequency distribution gives the monthly comsumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

માસિક વપરાશ (એકમમાં)	ગ્રાહકોની સંખ્યા
65 - 85	4
85 - 105	5
105 - 125	13
125 - 145	20
145 - 165	14
165 - 185	8
185 - 205	4

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2. If the median of 60 observations, given below is 28.5, find the values of x and y.

વર્ગ-અંતરાલ	આવૃત્તિ
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
કુલ	**60**

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3. A life insurance agent found the following data about distribution of ages of 100 policy

holders. Calculate the median age. [Policies are given only to persons having age 18 years onwards but less than 60 years.]

ઉંમર (વર્ષમાં)	પૉલિસીધારકોની સંખ્યા
20 થી ઓછી	2
25 થી ઓછી	6
30 થી ઓછી	24
35 થી ઓછી	45
40 થી ઓછી	78
45 થી ઓછી	89
50 થી ઓછી	92
55 થી ઓછી	98
60 થી ઓછી	100

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4. The lengths of 40 leaves of a plant are measured correct to the nearest millimetre, and the data obtained is represented in the following table:

લંબાઈ (મિમીમાં)	પાંદડાંઓની સંખ્યા
118 - 126	3
127 - 135	5
136 - 144	9
145 - 153	12
154 - 162	5
163 - 171	4
172 - 180	2

Find the median length of the leaves. (Hint: The data needs to be converted to continuous classes for finding the median , since the formula assumes continuous classes. The

classes then change to 117.5-126.5, 126.5-135.5, ...171.5-180.5.)

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5. The following table gives the distribution of the life-time of 400 neon lamps

આયુષ્ય (કલાકોમાં)	ગોળાની સંખ્યા
1500 - 2000	14
2000 - 2500	56
2500 - 3000	60
3000 - 3500	86
3500 - 4000	74
4000 - 4500	62
4500 - 5000	48

Find the median life time of a lamp.

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6. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabet in the surnames was obtained as follows

અક્ષરોની સંખ્યા	1 - 4	4 - 7	7 - 10	10 - 13	13 - 16	16 - 19
અટકોની સંખ્યા	6	30	40	16	4	4

Determine the median number of letters in the surnames . Find the mean number of letters in the surnames ? Also, find the modal size of the surnames.

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7. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

વજન (કિગ્રામાં)	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75
વિદ્યાર્થીઓની સંખ્યા	2	3	8	6	6	3	2

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Exercise 14 4

1. The following distribution gives the daily income of 50 workers of a factory.

દૈનિક વેતન (₹ માં)	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200
કામદારોની સંખ્યા	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution, and drawn its ogive.

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2. During the medical check-up of 35 students of a class, their weights were recorded as

follows :

વજન (કિલોગ્રામમાં)	વિદ્યાર્થીઓની સંખ્યા
38 કરતાં ઓછું	0
40 કરતાં ઓછું	3
42 કરતાં ઓછું	5
44 કરતાં ઓછું	9
46 કરતાં ઓછું	14
48 કરતાં ઓછું	28
50 કરતાં ઓછું	32
52 કરતાં ઓછું	35

Draw a less than type ogive for the given data. Hence, obtain the median weight from the graph and verify the result by using the formula.

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3. The following table gives production yield per hectare of wheat of 100 farms of a village.

ઉત્પાદન ક્ષમતા (કિગ્રા/હેક્ટર)	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
ખેતરોની સંખ્યા	2	8	12	24	38	16

Change the distribution to a more than type distribution , and draw its ogive.

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Do This

1. Find the mode of the following data.

5,6,9,10,6,12,3,6,11,10,4,6,7

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2. Find the mode of the following data.

20,3,7,13,3,4,6,7,19,15,7,18,3

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3. Is the mode always at the centre of the data

?

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Think And Discuss

1. The mean value can be calculated from both ungrouped and grouped data. Which one do you think is more accurate? Why?

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2. When is it more convenient to use grouped data for analysis?

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3. Is the result obtained by all the three methods same?

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4. If x_1 and f_i are sufficiently small, then which method is an appropriate choice?

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5. If x_i and f_i are numerically large numbers, then which methods are appropriate to use?

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6. It depends upon the demand of the situation whether we are interested in finding the average marks obtained by the students or the marks obtained by most of the students What do we find in the first situation?

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7. It depends upon the demand of the situation whether we are interested in finding the average marks obtained by the students or the marks obtained by most of the students What do we find in the first situation?

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8. Can mode be calculated for grouped data with unequal class sizes?

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