MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

STATISTICS

Exercise 14 1

1. Give five examples of data that you can collect from your day to day life

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2. Classify the data in above as primary or secondary data

Exercise 14 2

1. The blood groups of 30 students of Class VIII are recorded as follows: A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O, A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O. Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest, blood group among these students ?

2. The distance (in km) of 40 engineers from their residence to their place of work were found as follows :

5	3	10	20	25	11	13	7	12	31
19	10	12	17	18	11	32	17	16	2
7	9	7	8	3	5	12	15	18	3
12	14	2	9	6	15	15	7	6	12

Construct a grouped frequency distribution table with class size 5 for the data given above taking the first interval as 0-5 (5 not included). What main features do you observe from this tabular representation ?

3. The relative humidity (in %) of a certain city for a month of 30 days was as follows:

98.1	98.6	99.2	90.3	86.5	95.3
92.9	96.3	94.2	95.1	89.2	92.3
97.1	93.5	92.7	95.1	97.2	93.3
95.2	97.3	96.2	92.1	84.9	90.2
95.7	98.3	97.3	96.1	92.1	89

(i) Construct a grouped frequency distribution table with classes 84-86, 86-88, etc. (ii) Which month or season do you think this data is about ? (iii) What is the range of this data ?

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4. The heights of 50 students, measured to the nearest centimetres, have been found to be as follows:

161	150	154	165	168
161	154	162	150	151
162	164	171	165	158
154	156	172	160	170
153	159	161	170	162
165	166	168	165	164
154	152	153	156	158
162	160	161	173	166
161	159	162	167	168
159	158	153	154	159

(i) Represent the data given above by a grouped frequency distribution table, taking the class intervals as 160 - 165,165-170, etc. (ii) What can you conclude about their heights from the table ?

5. A study was conducted to find out the concentration of sulphur dioxide in the air in parts per million (ppm)

of a certain city. The data obtained for 30 days is as follows:

0.03	0.08	0.08	0.09	0.04	0.17
0.16	0.05	0.02	0.06	0.18	0.20
0.11	0.08	0.12	0.13	0.22	0.07
0.08	0.01	0.10	0.06	0.09	0.18
0.11	0.07	0.05	0.07	0.01	0.04

(i) Make a grouped frequency distribution table for this data with class intervals as 0.00 -0.04, 0.04 -0.08, and so on. (ii) For how many days, was the concentration of sulphur dioxide more than 0.11 parts per million ?

6. Three coins were tossed 30 times simultaneously. Each time the number of heads occurring was noted down as follows:

0	1	2	2	1	2	3	1	3	0
1	3	1	1	2	2	0	1	2	1
3	0	0	1	1	2	3	2	2	0

Prepare a frequency distribution table for the data given above.

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7. The value of π up to 50 decimal places is given below :

3.14159265358979323846264338327950288441971693997510

(i) Make a frequency distribution of the digits from 0

to 9 after the decimal point . (ii) Which are the most and the least frequency occurring digits ?

8. Thirty children were asked about the number of hours they watched TV programmes in the previous week. The results were found as follows:

1	6	2	3	5	12	5	8	4	8
10	3	4	12	2	8	15	1	17	6
3	2	8	5	9	6	8	7	14	12

(i) Make a grouped frequency distribution table for this data, taking class width 5 and one of the class intervals as 5 - 10. (ii) How many children watched television for 15 or more hours a week ?

9. A company manufactures car batteries of a particular type. The lives in years) of 40 such batteries were recorded as follows:

2.6	3.0	3.7	3.2	2.2	4.1	3.5	4.5
3.5	2.3	3.2	3.4	3.8	3.2	4.6	3.7
2.5	4.4	3.4	3.3	2.9	3.0	4.3	2.8
3.5	3.2	3.9	3.2	3.2	3.1	3.7	3.4
4.6	3.8	3.2	2.6	3.5	4.2	2.9	3.6

Construct a grouped frequency distribution table for this data, using class intervals of size 0.5 starting from the interval 2 - 2.5.

1. The following data on the number of girls (to the nearest ten) per thousand boys in different sections of Indian society is given below:

Section	Number of girls per thousand boys
Scheduled Caste (SC)	940
Scheduled Tribe (ST)	970
Non-SC / ST	920
Backward districts	950
Non-backward districts	920
Rural	930
Urban	910

(i) Represent the information above by a bar graph. (ii) In the classroom discuss what conclusions can be arrived at from the graph.

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2. The following data on the number of girls (to the nearest ten) per thousand boys in different sections of Indian society is given below:

Section	Number of girls per thousand boys
Scheduled Caste (SC)	940
Scheduled Tribe (ST)	970
Non-SC/ST	920
Backward districts	950
Non-backward districts	920
Rural	930
Urban	910

(i) Represent the information above by a bar graph. (ii) In the classroom discuss what conclusions can be arrived at from the graph.

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3. Given below are the seats won by different political parties in the polling outcome of a state assembly elections :

Political party	A	B	C	D	E	F
Seats won	75	55	37	29	10	37

(i) Draw a bar graph to represent the polling results.

(ii) Which political party won the maximum number of seats?

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4. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the

surnames was found as follows:

Number of letters	Number of surnames
1 – 4	6
4 – 6	30
6 – 8	44
8 – 12	16
12 – 20	4

(i) Draw a histogram to depict the given information,

(ii) Write the class interval in which the maximum number of surnames lie.

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5. The following table gives the distribution of the lifetime of 400 neon lamps :

Lifetime (in hours)	Number of lamps
1500 – 2000	14
2000 – 2500	56
2500 – 3000	60
3000 – 3500	86
3500 – 4000	74
4000 – 4500	62
4500 – 5000	48

Find the median of a lamp.

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6. The runs scored by two teams A and B on the first 60

balls in a cricket match are given below:

Number of balls	Team A	Team B	Number of balls	Team A	Team B
1 – 6	2	5	31 – 36	5	6
7 – 12	1	6	37 – 42	6	3
13 – 18	8	2	43 – 48	10	4
19 – 24	9	10	49 – 54	6	8
25 – 30	4	5	55 – 60	2	10

Represent the data of both the teams on the same graph by frequency polygons .

7. The following table gives the information about the number of students in different standards of a school :

Standard	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
No. of students	510	480	420	380	360	250

Represent the data by a Bar graph.

8. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	Number of surnames
1 – 4	6
4 – 6	30
6 – 8	44
8 – 12	16
12 – 20	4

(i) Draw a histogram to depict the given information,

(ii) Write the class interval in which the maximum number of surnames lie.

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9. In a city, the weekly observations made in a study on the cost of living index are given in the following table :

Cost of living Index	No. of weeks
140 – 150	5
150 – 160	10
160 – 170	20
170 – 180	9
180 – 190	6
190 – 200	2
Total	52

Draw a frequency polygon for the data above (without constructing a histogram).

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1. The following number of goals were scored by a team in a series of 10 matches : 2, 3, 4, 5, 0, 1, 3, 3, 4, 3 Find the mean, median and mode of these scores.

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2. In a mathematics test given to 15 students, the following marks (out of 100) are recorded : 41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60 Find the mean, median and mode of this data.

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3. 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

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4. Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18.

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5. Find the mean salary of 60 workers of a factory from the following table :

Salary (in ₹)	Number of workers
3000	16
4000	12
5000	10
6000	8
7000	6
8000	4
9000	3
10000	1
Total	60

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6. Give one example of a situation in which (i) the mean is an appropriate measure of central tendency. (ii) the mean is not an appropriate measure of central tendency but the median is an appropriate measure of central tendency.

Sum To Enrich Remember

1. Consider the marks obtained by 10 students in a mathematics test as given below: 55 36 95 73 60 42 25 78 75 62 Find the range of the data.

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2. Consider the marks obtained (out of 100 marks) by 30 students of Class IX of a school :

10	20	36	92	95	40	50	56	60	70
92	88	80	70	72	70	36	40	36	40
92	40	50	50	56	60	70	60	60	88

Represent this data in a frequency distribution table

3. 100 plants each were planted in 100 schools during

Van Mahotsava. After one month, the number of plants

that survived were recorded as:

95	67	28	32	65	65	69	33	98	96
76	42	32	38	42	40	40	69	95	92
75	83	76	83	85	62	37	65	63	42
89	65	73	81	49	52	64	76	83	92
93	68	52	79	81	83	59	82	75	82
86	90	44	62	31	36	38	42	39	83
87	56	58	23	35	76	83	85	30	68
69	83	86	43	45	39	83	75	66	83
92	75	89	66	91	27	88	89	93	42
53	69	90	55	66	49	52	83	34	36

Present this data in a condensed tabular form so that a reader can make sense of it easily

4. Let us now consider the following frequency distribution table which gives the weights of 38 students of a class :

Weight (in kg)	No. of students
31 – 35	9
36 – 40	5
41 – 45	14
46 – 50	3
51 – 55	1
56 – 60	2
61 – 65	2
66 – 70	1
71 – 75	1
Total	38

Convert the classes of above frequency distribution to continuous classes to include two new students weighing 35.5 kg and 40.5 kg.

5. In a particular section of Class IX, 40 students were asked about the month of their birth and the following graph was prepared for the data so obtained :
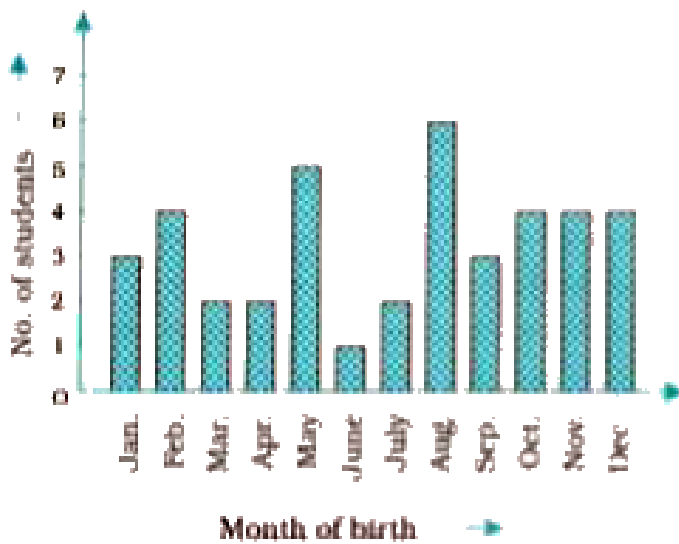
Observe the bar graph given above and answer the following questions: (i) How many students were born in the month of November? (ii) in which month were the maximum number of students born ?

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6. A family with a monthly income of Rs. 20,000 had planned the following expenditures per month unders

various heads :

Heads	Expenditure (in thousand rupees)
Grocery	4
Rent	5
Education of children	5
Medicine	2
Fuel	2
Entertainment	1
Miscellaneous	1

Draw a bar graph for the data above.

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7. The information regarding the marks scored by 30 students in a 20 mark test of Mathematics is given below:

Marks	4	6	10	15	18	20
No. of students	2	4	8	12	3	1

Find the mean of the data.

8. The data regarding the motion of two different objects A and B are given in the following table :

Time	Distance travelled by object A in m	Distance travelled by object B in m
9.30 am	10	12
9.45 am	20	19
10.00 am	30	23
10.15 am	40	35
10.30 am	50	37
10.45 am	60	41
11.00 am	70	44

Examine them carefully and state whether the motion of the objects is uniform or non-uniform.

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9. 5 people were asked about the time in a week they spend in doing social work in their community. They said 10, 7, 13, 20 and 15 hours, respectively. Find the mean (or average) time in a week devoted by them for social work.

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10. The information regarding the marks scored by 30 students in a 20 mark test of Mathematics is given below:

Marks		4	6	10	15	18	20
No. of students		2	4	8	12	3	1

Find the mean of the data.

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11. The heights (in cm) of 9 students of a class are as follows: 155, 160, 145, 149, 150, 147, 152, 144, 148 Find the median of this data.

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12. The points scored by a Kabaddi team in a series of matches are as follows: 17, 2, 7, 27, 15, 5, 14, 8, 10, 24, 48, 10, 8, 7, 18, 28 Find the median of the points scored by the team.

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13. Find the mode of the following marks (out of 10) obtained by 20 students : 4, 6, 5, 9, 3, 2, 7, 7, 6, 5, 4, 9, 10, 10, 3, 4, 7, 6, 9, 9

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14. Consider a small unit of a factory where there are 5 employees: a supervisor and four labourers. The labourers draw a salary of 75,000 per month each while the supervisor gets 715,000 per month. Calculate the mean, median and mode of the salaries of this unit of the factory.

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Skill Testing Exercise

1. The marks scored by 40 students in a Mathematics test are given below:

16	21	0	18	41	14	32	16	19	21
35	40	36	27	26	3	9	13	18	25
20	32	38	40	13	13	24	33	8	27
32	35	8	17	15	25	34	38	30	9

Prepare the frequency distribution with classes 0-4, 5-9.....

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2. The weights (in kg) of 30 girls of Primestreet Society are as below:

34	42	30	35	30	36	42	44	37	50
58	48	40	43	37	35	45	47	40	53
46	51	45	46	38	40	54	52	44	55

Prepare a frequency distribution with classes 30-35, 35-40 ....

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3. The marks scored by 40 students in a 60 mark test of english are as follows ,

50	2	10	20	30	40	12	22	31	44
4	16	35	18	15	27	35	30	31	49
32	24	26	14	29	37	36	42	38	48
31	34	33	20	56	28	41	54	39	59

Prepare the frequency distribution with classes 0-9,10-19,.....

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4. The information on the height (in cm) of 30 children is given below :

42	40	46	40	60	70	50	59	60	78
55	58	50	72	80	80	60	62	76	85
64	66	68	95	99	90	75	70	69	89

Prepare the frequency distribution with classes 40-50,50-60,....

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5. The following data on the number of girls (to the nearest ten) per thousand boys in different sections of Indian society is given below:

Section	Number of girls per thousand boys
Scheduled Caste (SC)	940
Scheduled Tribe (ST)	970
Non-SC / ST	920
Backward districts	950
Non-backward districts	920
Rural	930
Urban	910

(i) Represent the information above by a bar graph. (ii)

In the classroom discuss what conclusions can be arrived at from the graph.

6. Draw a histogram for the frequency distribution :

Class	10 – 15	15 – 20	20 – 30	30 – 40	40 – 55	55 – 75	75 – 100
Frequency	8	14	20	28	30	24	10

7. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the

surnames was found as follows:

Number of letters	Number of surnames
1 – 4	6
4 – 6	30
6 – 8	44
8 – 12	16
12 – 20	4

(i) Draw a histogram to depict the given information,

(ii) Write the class interval in which the maximum number of surnames lie.

8. Draw a frequency polygon for the following frequency distribution :

Class	0 – 4	4 – 8	8 – 12	12 – 16	16 – 20	20 – 24
Frequency	3	5	8	6	4	2

9. The weight (in kg) of seven students are given below: 35, 30, 42, 36, 38, 40, 45 Find the mean weight.

10. The information regarding the marks scored by 30 students in a 20 mark test of Mathematics is given below:

Marks	4	6	10	15	18	20
No. of students	2	4	8	12	3	1

Find the mean of the data.

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11. The height (in cm) of 100 students of a school are

tabulated below:

Height (in cm)	115	118	120	124	130	132	135
No. of students	6	18	24	25	12	8	7

Find the mean of the data.

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12. Find the median of the observations 13, 9, 15, 8, 6, 3.

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13. Find the median of the observations 12, 41, 34, 26. 31, 22, 10.

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14. Find the mode of the observations 17, 10, 13, 18, 22, 13, 26, 9, 13, 19.

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15. Find the mode of the observations 25, 20, 16, 12, 20, 16, 19, 23, 31, 20, 11, 18, 16.

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16. Find the mean, the median and the mode of the observations 24, 12, 15, 28, 15, 22, 17.

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17. Some observations are arranged in the ascending order as 9, a +3, a +7, 20, 23 and 26. If the median of

the data is 18.5, find the value of a. Also find the mean
of the data.

18. The mean of 5 observations is 20. Including one
new observation, the mean is 25. Find the newly
included observation.

19. The mean of 10 observations is 28. If 2 is added to
each observation and then each result is divided by 3,
find the mean of new observations so obtained.

20. Find the mean of the following frequency distribution:

Score	10	20	30	40	50	60	70	80
Frequency	4	2	1	2	0	3	5	3

21. If the mean of the following frequency distribution is 26.7, find the missing frequency f:

Observation	15	20	25	30	35	40
Frequency	4	8	18	f	7	3

Multiple Choice Questions

1. The marks scored by Kavya in 10 tests of Mathematics are 35. 18, 41, 24, 45, 10, 28, 32, 40, 15. Then, the range of the data is........

A. 45

B. 10

C. 35

D. 28.8

Answer: C

2. The average of the observations 3, 4, 5, 8, 12, 10, 13, 16, 18, 11 is ....

A. 100

B. 10

C. 18

D. 3

Answer: A

3. The mean of first five odd natural numbers is ....

A. 3

B. 5

C. 4

D. 25

Answer:

4. The mean of first four even natural numbers is ...

A. 5

B. 10

C. 20

D. 4

Answer:

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5. The mean of first five prime numbers is

A. 28

B. 2.8

C. 5.6

D. 1.4

Answer:

6. If the mean of 2x, 5, 3x, 12, 5x, 17 and6 is 20, then x =

....

A. 10

B. 20

C. 15

D. 40

Answer: A

7. The mean of the following distribution is............

x_i	1	3	4	5	6
f_i	3	5	2	8	2

A. 3.9

B. 7.8

C. 78

D. 39

Answer: C

8. If the mean of 12, 13, x, 17, 18 and 20 is 16, then x =

....

A. 8

B. 4

C. 16

D. 32

Answer: A

9. For a given frequency distribution, n = 20 and $\sum f_i x_i = 140$, then $\bar{x}$ = ...

A. 20

B. 14

C. 7

D. 28

Answer:

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10. The mean of $\dfrac{2}{5}, \dfrac{5}{7}, \dfrac{3}{5}$ and $\dfrac{2}{7}$ is ....

A. $\dfrac{1}{2}$

B. $\dfrac{3}{5}$

C. $\dfrac{5}{7}$

D. 2

Answer: A::B

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11. The median of 14, 6, 2, 13, 9, 15 and 12 is ....

A. 21

B. 20

C. 33

D. 19

Answer: A::B

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12. The median of 21, 17, 13, 33, 19, 23 is......

A. 21

B. 20

C. 33

D. 19

Answer: B

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