



CLASS IX: MATHS
Chapter 12: Statistics

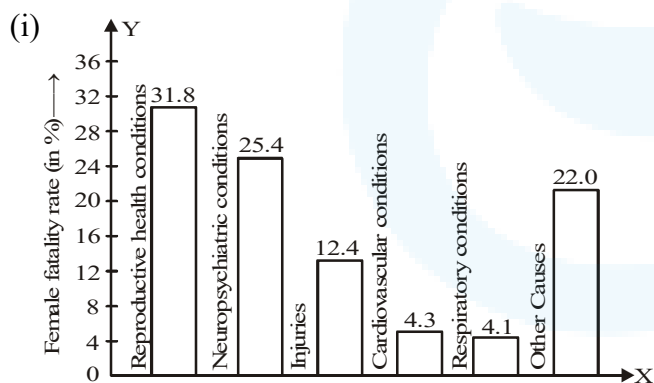
Questions and Solutions | Exercise 12.1 - NCERT Books

Q1. A survey conducted by an organisation for the cause of illness and death among the women between the ages 15 – 44 (in years) worldwide, found the following figures (in %):

S.No.	Causes	Female fatality rate (%)
1	Reproductive health conditions	31.8
2	Neuropsychiatric conditions	25.4
3	Injuries	12.4
4	Cardiovascular conditions	4.3
5	Respiratory conditions	4.1
6	Other causes	22

- (i) Represent the information given above graphically.
- (ii) Which condition is the major cause of women's ill health and death worldwide?
- (iii) Try to find out, with the help of your teacher, any two factors which play a major role in the cause in (ii) above being the major cause.

Sol.



- (ii) Reproductive health conditions is the major cause of women's ill health and death worldwide.
- (iii) Two factors may be uneducation and poor background.

Q2. 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

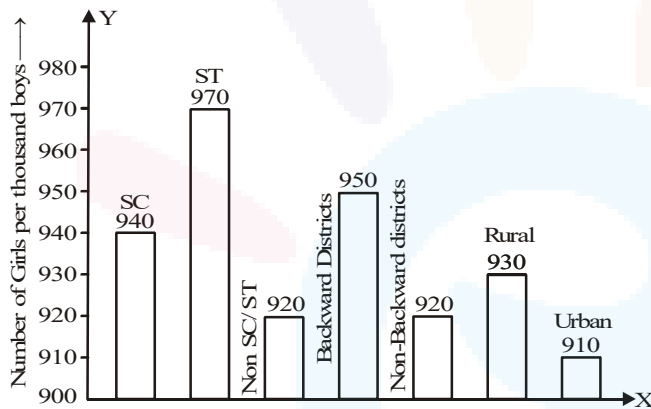


Scheduled Tribe (ST)	970
Non SC/ST	920
Backward districts	950
Non-backward districts	920
Rural	930
Urban	910

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

Sol. (i) We have 5 entries in the data and their values and 940, 970, 920, 950, 920, 930, 910. We will plot these values on the Y-axis and the marking will be as below :
900, 910, 920, 930, 940, 950, 960, 970, 980.

(ii) We take one unit of length along the Y-axis = 10.

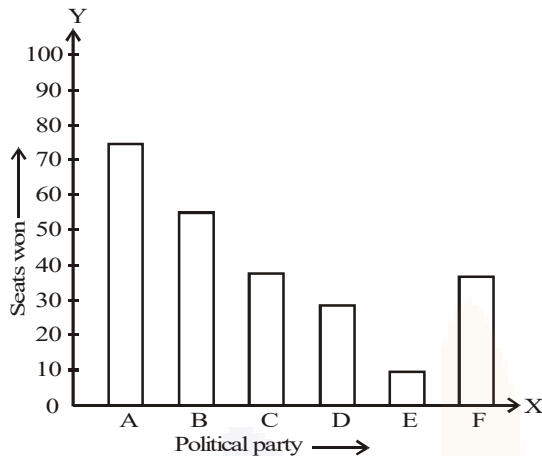


Q3. Given below are the seats won by different political parties in the polling outcome of a state assembly elections:

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?

Sol. (i) The required bar graph is given below :



(ii) The political party A won the maximum number of seats.

Q4. The length of 40 leaves of a plant are measured correct to one millimetre, and the obtained data is represented in the following table :

Length (in mm)	Number of leaves
118-126	3
127-135	5
136-144	9
145-153	12
154-162	5
163-171	4
172-180	2

- (i) Draw a histogram to represent the given data.
- (ii) Is there any other suitable graphical representation for the same data?
- (iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

Sol. (i) The given frequency distribution is not continuous. Therefore, first we have to modify it to be a continuous distribution.

$$\frac{127 - 126}{2} = \frac{1}{2} = 0.5$$

∴ The modified class intervals are :

$$\begin{aligned} (118 - 0.5) \quad (126 + 0.5) &= 117.5 \quad 126.5 \\ (127 - 0.5) \quad (135 + 0.5) &= 126.5 \quad 135.5 \\ (136 - 0.5) \quad (144 + 0.5) &= 135.5 \quad 144.5 \end{aligned}$$

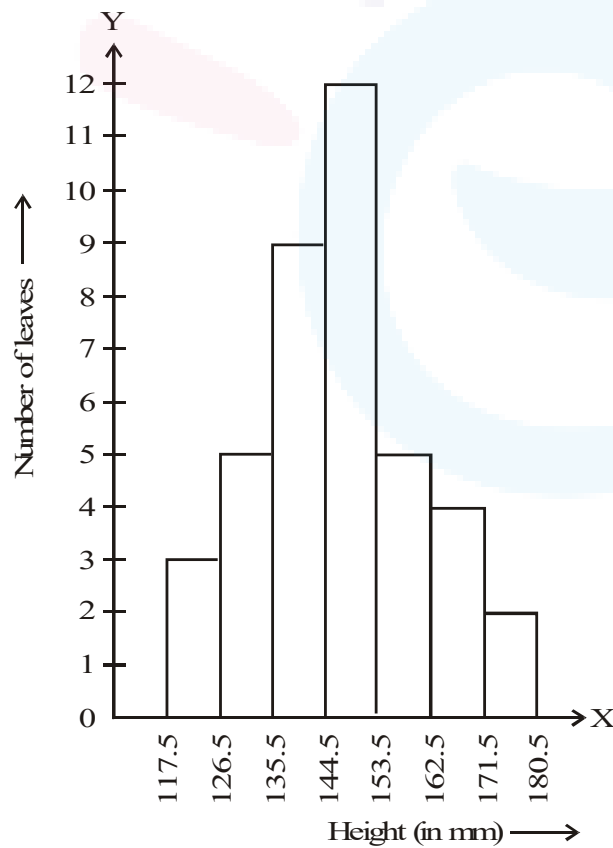


$$\begin{aligned}
 (145 - 0.5) & \quad (153 + 0.5) = 144.5 & 153.5 \\
 (154 - 0.5) & \quad (162 + 0.5) = 153.5 & 162.5 \\
 (163 - 0.5) & \quad (171 + 0.5) = 162.5 & 171.5 \\
 (172 - 0.5) & \quad (180 + 0.5) = 171.5 & 180.5
 \end{aligned}$$

Thus, the modified frequency distribution is

Length (in mm)	Number of leaver
117.5 - 126.5	3
126.5 - 135.5	5
135.5 - 144.5	9
144.5 - 153.5	12
153.5 - 162.5	5
162.5 - 171.5	4
171.5 - 180.5	2

Now, the required histogram of the above frequency distribution is as shown here :



(ii) Yes, other suitable graphical representation is a “frequency polygon”

(iii) No, it is not a correct statement. The maximum number of leaves are not 153 mm long



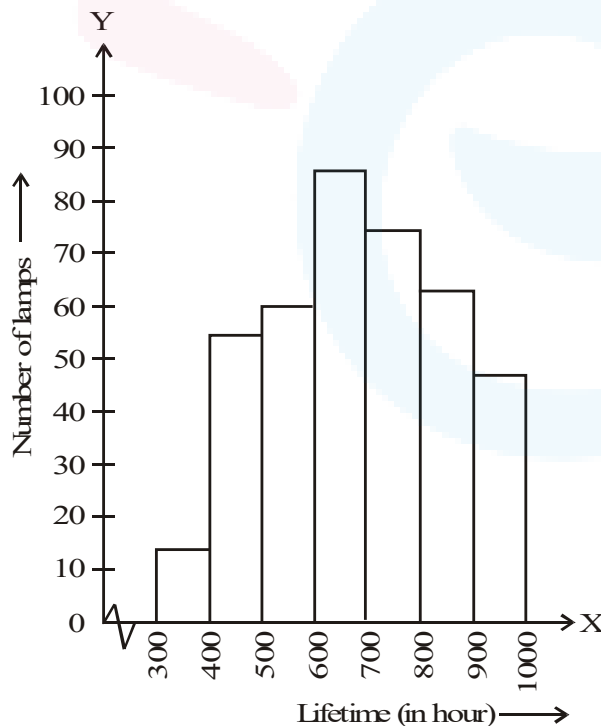
rather they are from 145 mm to 153 mm long.

Q5. The following table gives the life times of 400 neon lamps:

Life time (in hours)	Number of lamps
300-400	14
400-500	56
500-600	60
600-700	86
700-800	74
800-900	62
900-1000	48

- (i) Represent the given information with the help of a histogram.
- (ii) How many lamps have a life time of more than 700 hours?

Sol. (i) The required histogram is shown as :



(ii) Number of lamps having lifetime more than 700 hours = $74 + 62 + 48 = 184$

Q6. The following table gives the distribution of students of two sections according to the marks obtained by them :



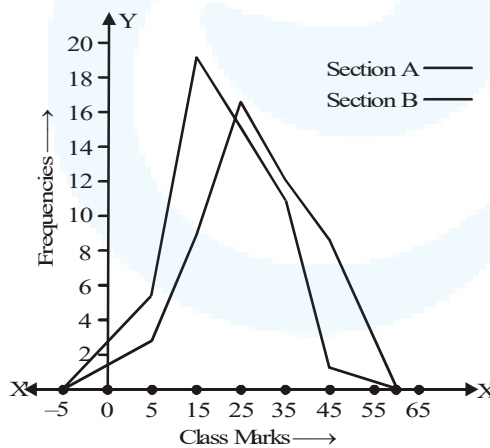
Section A		Section B	
Marks	Frequency	Marks	Frequency
0-10	3	0-10	5
10-20	9	10-20	19
20-30	17	20-30	15
30-40	12	30-40	10
40-50	9	40-50	1

Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

Sol. Class marks for section A are : 5, 15, 25, 35, 45 and corresponding frequencies as 3, 9, 17, 12, 9 respectively.

Its frequency polygon is the join of the points (by line segments) $(-5, 0)$, $(5,3)$, $(15,9)$, $(25,17)$, $(35, 12)$, $(45, 9)$ and $(60, 0)$.

Similarly for the section B, the frequency polygon is the join of the points $(-5, 0)$, $(5,5)$, $(15,19)$, $(25, 15)$, $(35, 10)$, $(45, 1)$ and $(60, 0)$.



Q7. 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
1-6	2	5
7-12	1	6
13-18	8	2
19-24	9	10
25-30	4	5
31-36	5	6
37-42	6	3
43-48	10	4
49-54	6	8
55-60	2	10

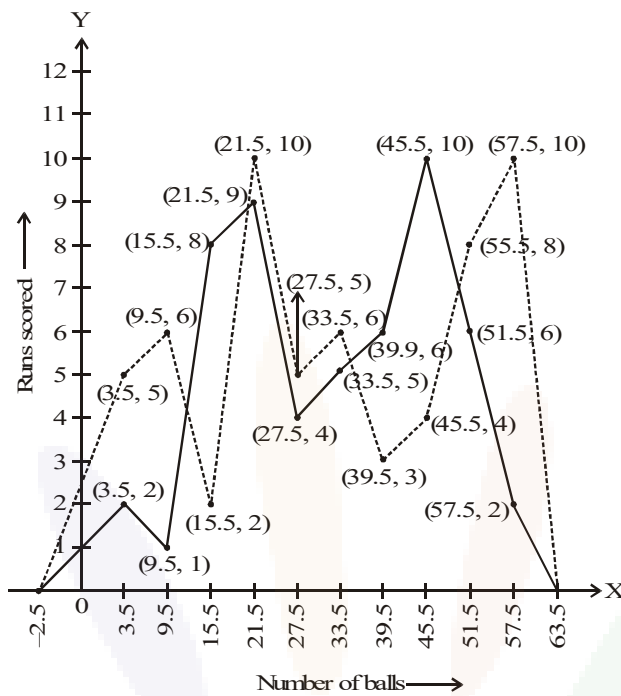
Represent the data of both the teams on the same graph by frequency polygons.

[Hint: First make the class intervals continuous.]

Sol. The given class intervals are not continuous. Therefore, we first modify the distribution as continuous.

Number of Balls	Class Marks	Frequency Team A	Frequency Team B
0.5 - 6.5	3.5	2	5
6.5 - 12.5	9.5	1	6
12.5 - 18.5	15.5	8	2
18.5 - 24.5	21.5	9	10
24.5 - 30.5	27.5	4	5
30.5 - 36.5	33.5	5	6
36.5 - 42.5	39.5	6	3
42.5 - 48.5	45.5	10	4
48.5 - 54.5	51.5	6	8
54.5 - 60.5	57.5	2	10

Plotting the above observed pair on the same graph paper, we get



Q8. A random survey of the number of children of various age groups playing in a park was found as follows:

Age (in years)	Number of children
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

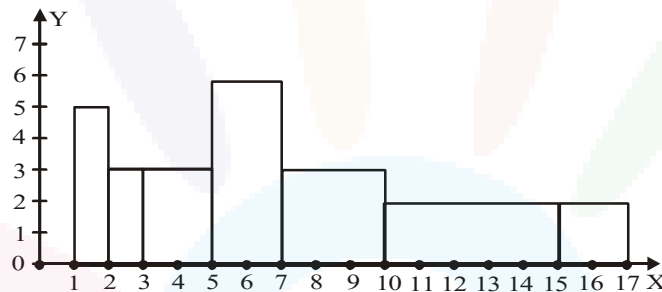
Draw a histogram to represent the data above.

Sol. The width of the class interval is not uniform. We make calculations for proportionate heights of the rectangles of the histogram to be made as in the following table.



Age (in years)	Frequency	Width	Height of the rectangle
1-2	5	1	$5/1 \times 1 = 5$
2-3	3	1	$3/1 \times 1 = 3$
3-5	6	2	$6/2 \times 1 = 3$
5-7	12	2	$12/2 \times 1 = 6$
7-10	9	3	$9/3 \times 1 = 3$
10-15	10	5	$10/5 \times 1 = 2$
15-17	4	2	$4/2 \times 1 = 2$

Now, we make the histogram from the above table.



Q9. 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:

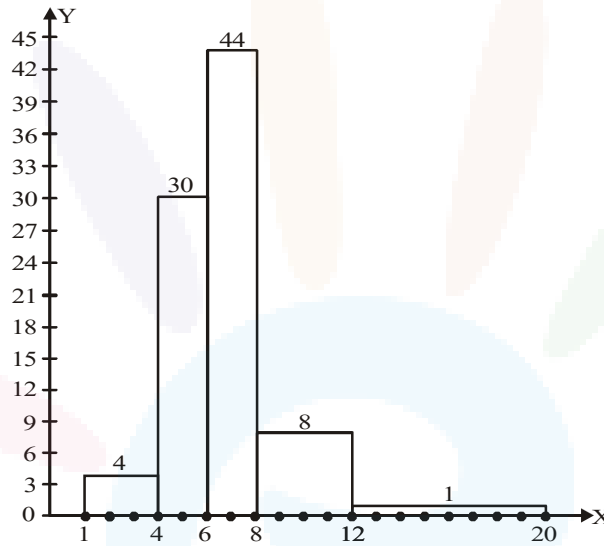
Number of letters	Number of surnames
1-4	6
4-6	30
6-8	44
8-12	16
12-20	4

- Draw a histogram to depict the given information.
- Write the class interval in which the maximum number of surnames lie.

Sol. (i) As in solution 8, we make adjustments about the heights of the rectangle of the required histogram and make a table as below :



Number of letters	Frequency	Width of interval	Height of rectangle
1-4	6	3	$6/3 \times 2 = 4$
4-6	30	2	$30/2 \times 2 = 30$
6-8	44	2	$44/2 \times 2 = 44$
8-12	16	4	$16/4 \times 2 = 8$
12-20	4	8	$4/8 \times 2 = 1$



(ii) (6-8)