

Mathematics

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(Chapter - 14)(Statistics)

(Class - 9)

Exercise 14.3

Question 1:

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	22.0

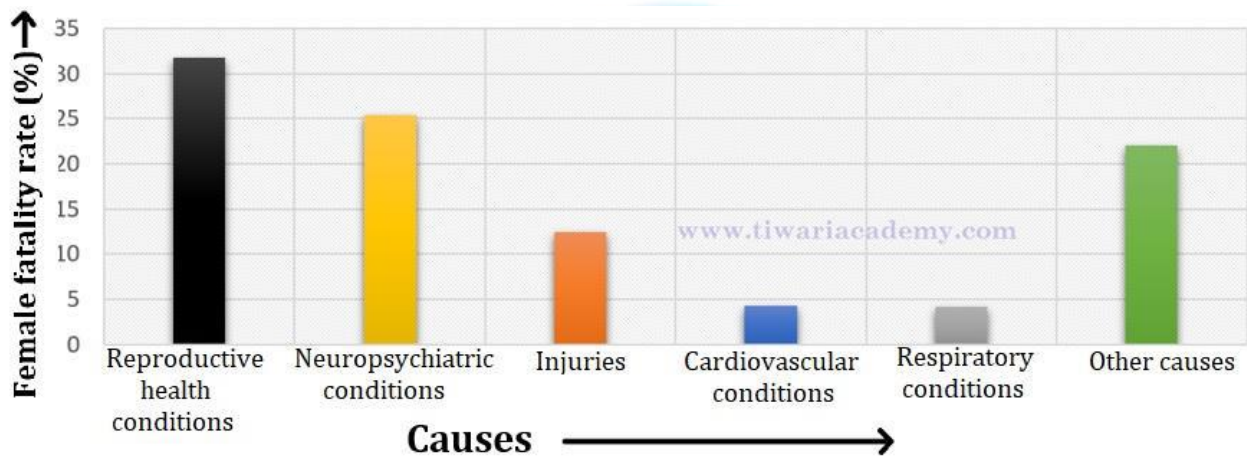
(i) Represent the information given above graphically.

(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.

Answer 1:

(i) Taking a suitable distance, the causes are taken on x-axis. The width of each bar and distance between the two bars is constant. The female fatality rate is drawn on y-axis. Here, the maximum rate (%) is 31.8, so we can take scale as 1 unit = 5%.



(ii) Reproductive health condition is the major cause of women's ill health and death worldwide because it has maximum female fatality rate (31.8%).

(iii) Lack of medical facilities and less knowledge about disease related to female is the main reason.

Question 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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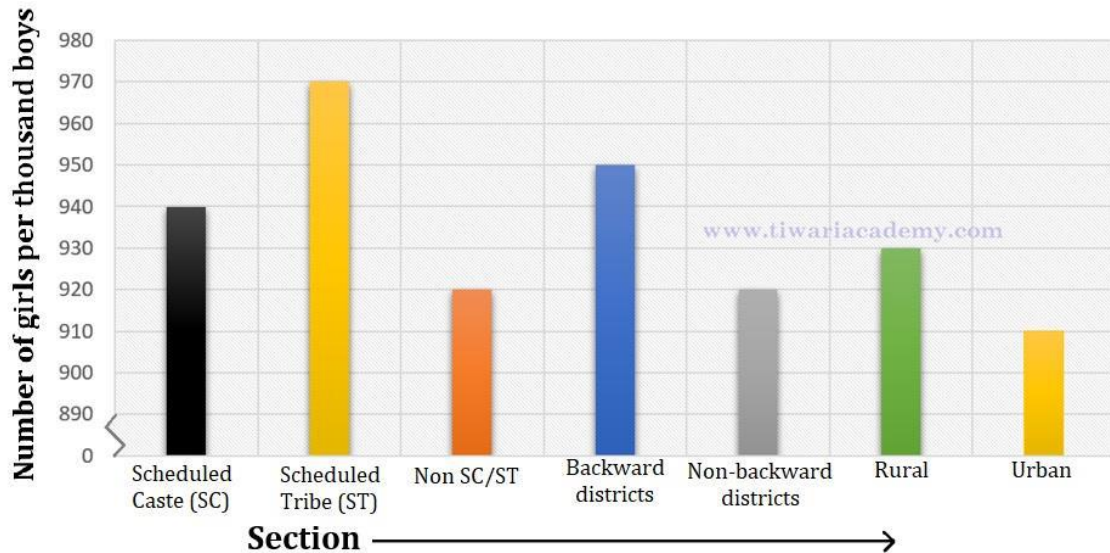
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Answer 2:

(i) Taking a suitable distance, the causes are taken on x-axis. The width of each bar and distance between the two bars is constant. Taking 'number of girls per 1000' on y-axis and suitable scale the bar graph is drawn. Here, the number of girls lie between 910 and 970, so the scale is 1 unit = 10 girls.



(ii) As per conclusion of the graph, the number of girls per 1000 boys is maximum (970) in scheduled Tribe and minimum (910) in urban areas.

Question 3:

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

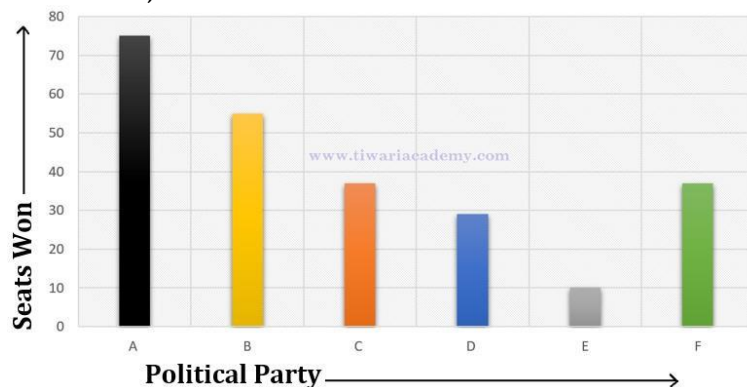
Political Party	Seats Won
A	75
B	55
C	37
D	29
E	10
F	37

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

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

Answer 3:

(i) Taking a suitable distance, the causes are taken on x-axis. The width of each bar and distance between the two bars is constant. Taking number of seats won on y-axis and suitable scale the bar graph is drawn below. As the maximum number of seats won is 75, so the scale is 1 units = 10 seats.



(ii) Political party A won the maximum (75) number of seats.

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Question 4:

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?

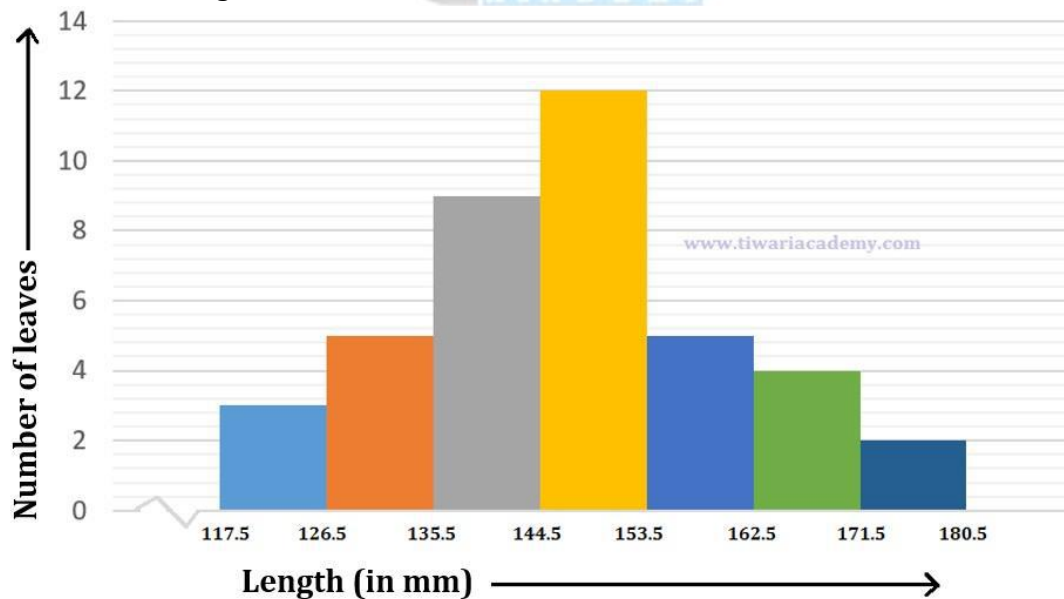
(iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

Answer 4:

(i) Here, the class intervals are not continuous. So, to make it continuous, add 0.5 to upper limit and subtract 0.5 from the lower limit. The new continuous class intervals are 117.5 - 126.5, 126.5 - 135.5, 135.5 - 144.5, etc.

Length (in mm)	Number of leaves
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

The histogram for the data is given below:



(ii) The other suitable graphical representation for the same data is frequency polygon.

(iii) No, because the number of leaves are maximum (12) in 144.5 to 153.5 range. But this doesn't mean to say that each are 153 in length.

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Question 5:

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

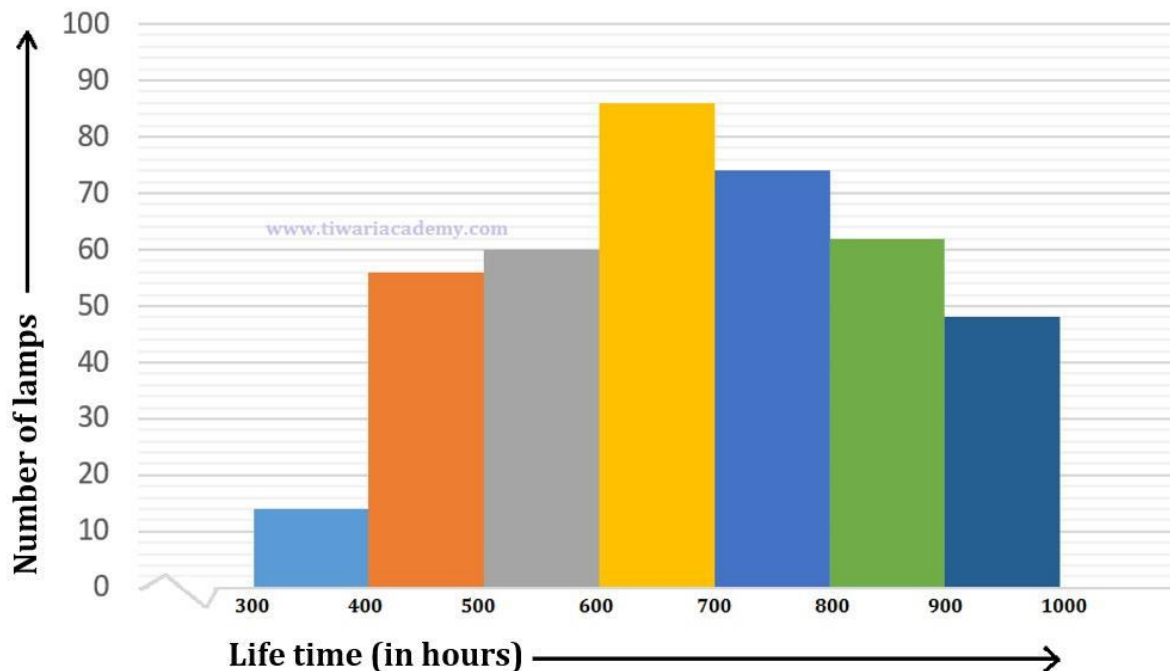
Life time (in hours)	Number of lamps
300 - 400	14
400 - 500	56
500 - 600	60
600 - 700	86
700 - 800	74
800 - 900	62
900 - 1000	48

(i) Represent the given information with the help of a histogram.

(ii) How many lamps have a life time of more than 700 hours?

Answer 5:

(i) The histogram representing the above data is given below:



(ii) $184 (74 + 62 + 48 = 184)$ lamps have a life time of more than 700 hours.

Question 6:

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.

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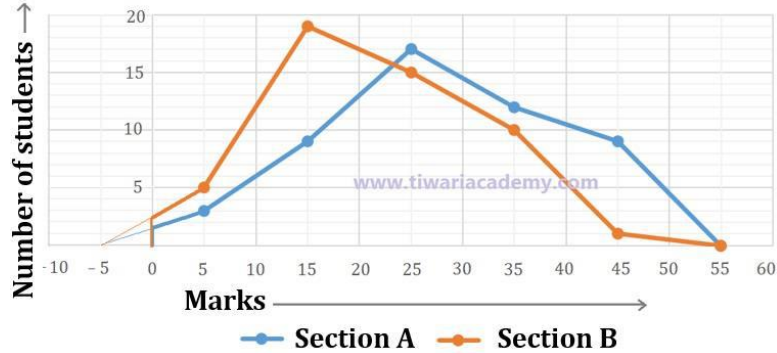
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Answer 6:

Section A			Section B		
Marks	Class - Mark	Frequency	Marks	Class - Mark	Frequency
0 - 10	5	3	0 - 10	5	5
10 - 20	15	9	10 - 20	15	19
20 - 30	25	17	20 - 30	25	15
30 - 40	35	12	30 - 40	35	10
40 - 50	45	9	40 - 50	45	1

The frequency polygon of the above data is given below:



The comparison of two polygons states that the performance of students of section A is better than section B.

Question 7:

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.]

Answer 7:

Here, the class intervals are not continuous. So, to make it continuous, add 0.5 to upper limit and subtract 0.5 from the lower limit. The new continuous class intervals are 0.5 - 6.5, 6.5 - 12.5, 12.5 - 18.5, etc.

Number of balls	Class - Mark	Team A	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

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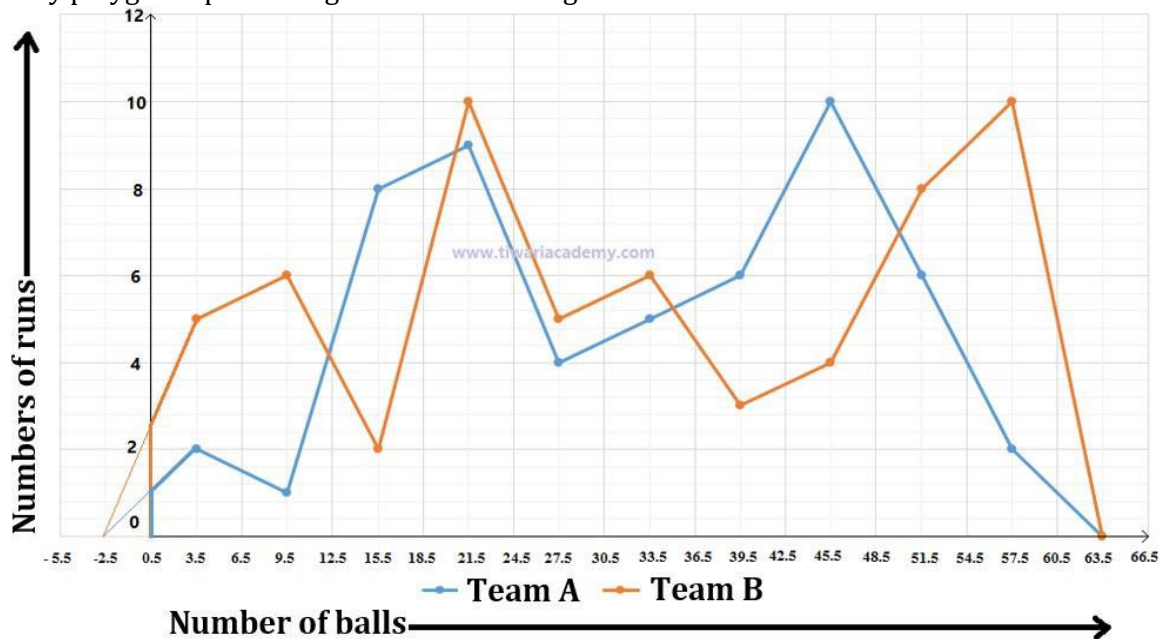
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The frequency polygon representing the above data is given below:



Question 8:

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.

Answer 8:

Areas of rectangles in histogram is directly proportional to frequency. Here, the width of rectangles are changing, so length must be changed to make the area of rectangle proportional to frequencies.

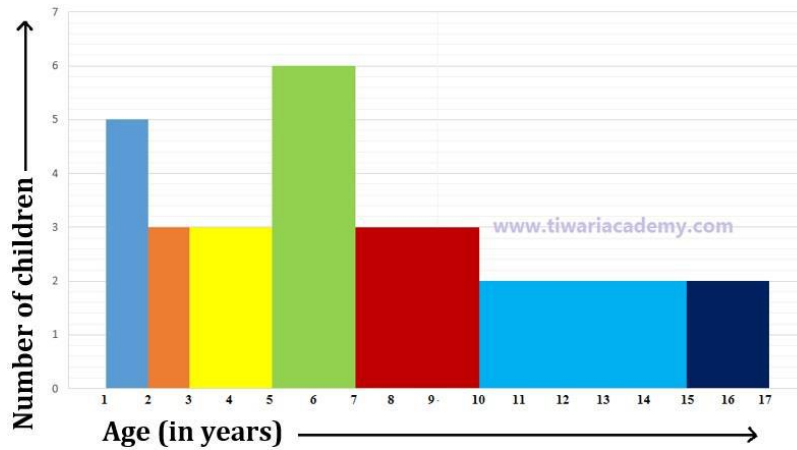
Age (in years)	Number of children	Width of rectangle	Length of rectangle
1 - 2	5	1	$\frac{5}{1} \times 1 = 5$
2 - 3	3	1	$\frac{3}{1} \times 1 = 3$
3 - 5	6	2	$\frac{6}{2} \times 1 = 3$
5 - 7	12	2	$\frac{12}{2} \times 1 = 6$
7 - 10	9	3	$\frac{9}{3} \times 1 = 3$
10 - 15	10	5	$\frac{10}{5} \times 1 = 2$
15 - 17	4	2	$\frac{4}{2} \times 1 = 2$

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Question 9:

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:

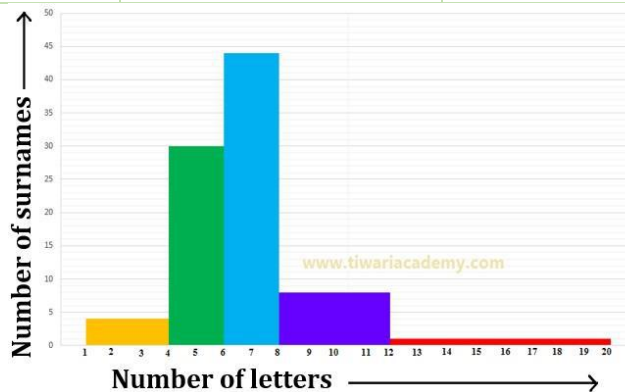
Number of letters	Number of surnames
1 - 4	6
4 - 6	30
6 - 8	44
8 - 12	16
12 - 20	4

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

Answer 9:

(i) Areas of rectangles in histogram is directly proportional to frequency. Here, the width of rectangles are changing, so length must be changed to make the area of rectangle proportional to frequencies.

Number of letters	Number of surnames	Width of rectangle	Length of rectangle
1 - 4	6	3	$\frac{6}{3} \times 2 = 4$
4 - 6	30	2	$\frac{30}{2} \times 2 = 30$
6 - 8	44	2	$\frac{44}{2} \times 2 = 44$
8 - 12	16	4	$\frac{16}{4} \times 2 = 8$
12 - 20	4	8	$\frac{4}{8} \times 2 = 1$



- (ii) In the class interval 6 - 8, the maximum (44) surnames lie.

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