

EXERCISE 14.4

1. The following are the marks (out of 100) of 60 students in mathematics.

16, 13, 5, 80, 86, 7, 51, 48, 24, 56, 70, 19, 61, 17, 16, 36, 34, 42, 34, 35, 72, 55, 75, 31, 52, 28, 72, 97, 74, 45, 62, 68, 86, 35, 85, 36, 81, 75, 55, 26, 95, 31, 7, 78, 92, 62, 52, 56, 15, 63, 25, 36, 54, 44, 47, 27, 72, 17, 4, 30.

Construct a grouped frequency distribution table with width 10 of each class starting from 0 - 9.

Solution:

Arrange the given data in ascending order

4, 5, 7, 7, 13, 15, 16, 16, 17, 17, 19, 24, 25, 26, 27, 28, 30, 31, 31, 34, 34, 35, 35, 36, 36, 36, 42, 44, 45, 47, 48, 51, 52, 52, 54, 55, 55, 56, 56, 61, 62, 62, 63, 68, 70, 72, 72, 72, 74, 75, 75, 78, 80, 81, 85, 86, 86, 92, 95, 97

Then arrange the given data into groups with 10 as class width in each case

The Frequency Distribution Table of the given data can be represented as follows:

Class intervals	Tally marks	Frequency
0 - 9		4
10 - 19		7
20 - 29		5
30 - 39		10
40 - 49		5
50 - 59		8
60 - 69		5
70 - 79		8
80 - 89		5
90 - 99		3

2. Refer to Q1 above. Construct a grouped frequency distribution table with width 10 of each class, in such a way that one of the classes is 10 - 20 (20 not included).

Solution:

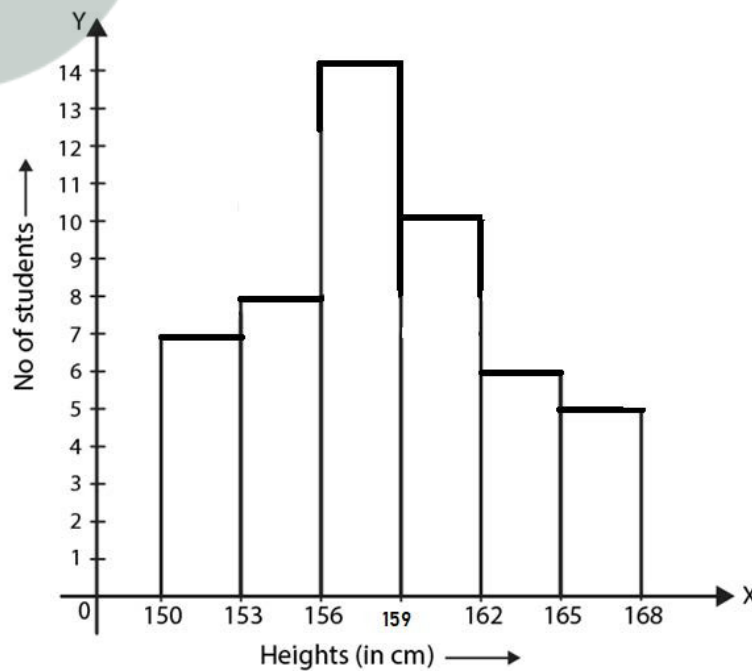
The grouped frequency distribution table with width 10 of each class, in such a way that one of the classes is 10 - 20 (20 not included) is represented below:

Class interval	Tally marks	Frequency
0 - 10		4
10 - 20	 	7
20 - 30	 /	5
30 - 40	 	10
40 - 50	 /	5
50 - 60	 	8
60 - 70	 /	5
70 - 80	 	8
80 - 90	 /	5
90 - 100		3

3. Draw a histogram of the following distribution:

Heights (in cm)	Number of students
150 - 153	7
153 - 156	8
156 - 159	14
159 - 162	10
162 - 165	6
165 - 168	5

Solution:



4. Draw a histogram to represent the following grouped frequency distribution:

Ages (in years)	Number of teachers
20 - 24	10
25 - 29	28
30 - 34	32
35 - 39	48
40 - 44	50
45 - 49	35
50 - 54	12

Solution:

The frequency distribution table is in inclusive form. First we must convert it to exclusive form. Consider the class 20 - 24, 25 - 29.

Lower limit of 25 - 29 is 25

Upper limit of 20 - 24 is 24

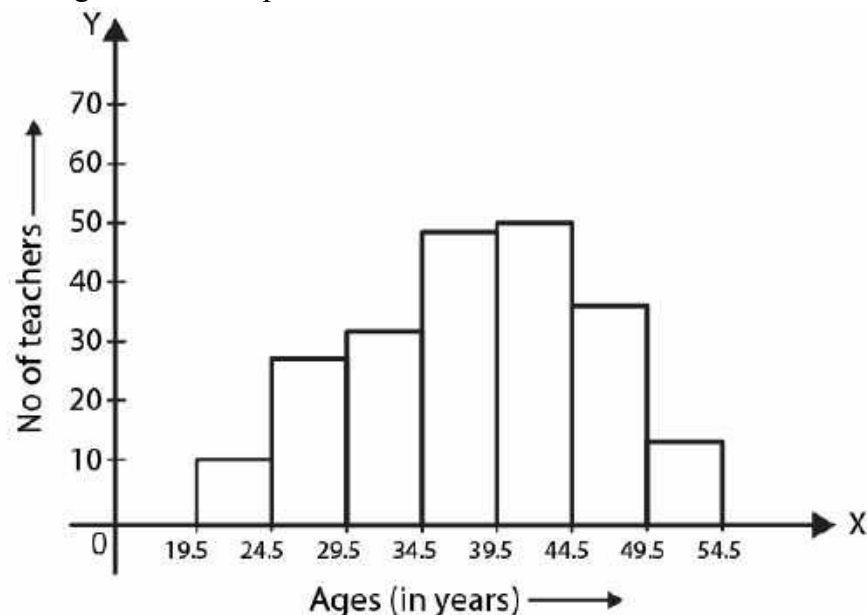
Half of the difference = $(25 - 24) / 2 = 1 / 2 = 0.5$

We should subtract 0.5 from each lower limit and add 0.5 to each upper limit.

Let us first make the data continuous:

Ages	Number of teachers
19.5 - 24.5	10
24.5 - 29.5	28
29.5 - 34.5	32
34.5 - 39.5	48
39.5 - 44.5	50
44.5 - 49.5	35
49.5 - 54.5	12

Hence, the histogram can be represented as:



5. The lengths of 62 leaves of a plant are measured in millimetres and the data is represented in the following table:

Length (in mm)	Number of leaves
118 - 126	8
127 - 135	10
136 - 144	12
145 - 153	17
154 - 162	7
163 - 171	5
172 - 180	3

Draw a histogram to represent the data above.

Solution:

Let us first make the data continuous:

Length (in mm)	Number of Leaves
117.5 – 126.5	8
126.5 – 135.5	10
135.5 – 144.5	12
144.5 – 153.5	17
153.5 – 162.5	7
162.5 – 171.5	5
171.5 – 180.5	3

Hence, the histogram can be represented as:

