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* Make alternations clearly.

* Give the calculations a logical pattern on the sheet.

HISTOGRAM:-

Histogram is a commonly used device for charting continuous frequency distribution.

Construction of Histogram:

* Histogram with equal classes.

* Histogram with unequal classes.

Histogram with equal classes:

* If classes are of equal magnitude, each class interval is drawn on X-axis by a section which is equal to the magnitude of the class interval.

* On each class interval erect a rectangle with the height proportional to the corresponding frequency of the class.

The series of adjacent rectangles (one for each class) so formed gives the histogram of the frequency distribution and its area represents the total frequency of the distribution.

Histogram with unequal classes:

If the classes are not uniform, then the different classes are represented on X-axis by sections which are equal to the magnitude of the corresponding rectangles are to be adjusted so that the



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Area of the rectangle is equal to the frequency of the corresponding class.

$$\left[\begin{array}{l} \text{Frequency density} \\ \text{of a class} \end{array} \right] = \frac{\text{Frequency of the class}}{\text{Magnitude of the class}}$$

Example:-

Represent the adjoining distribution of marks of 100 students in the examination by a histogram:

Marks	Obtained	Number of students
Less than 10	10	4
Less than 20	20	6
Less than 30	30	24
Less than 40	40	46
Less than 50	50	67
Less than 60	60	86
Less than 70	70	96
Less than 80	80	99
Less than 90	90	100

Solution:

First convert the given cumulative frequency distribution into the frequency distribution of marks:

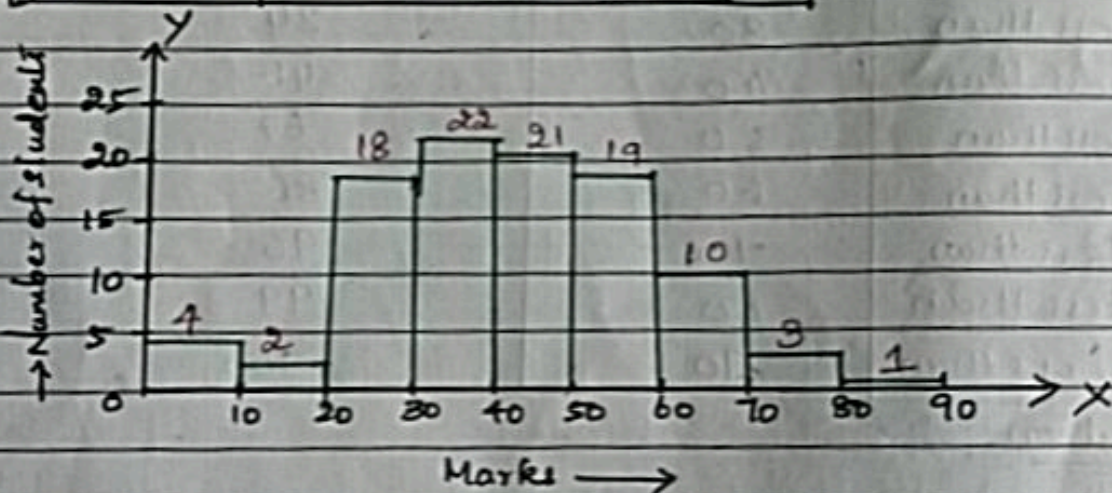


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Marks	Number of students
0-10	4
10-20	$6-4=2$
20-30	$24-6=18$
30-40	$46-24=22$
40-50	$67-46=21$
50-60	$86-67=19$
60-70	$96-86=10$
70-80	$99-96=3$
80-90	$100-99=1$



Example 2

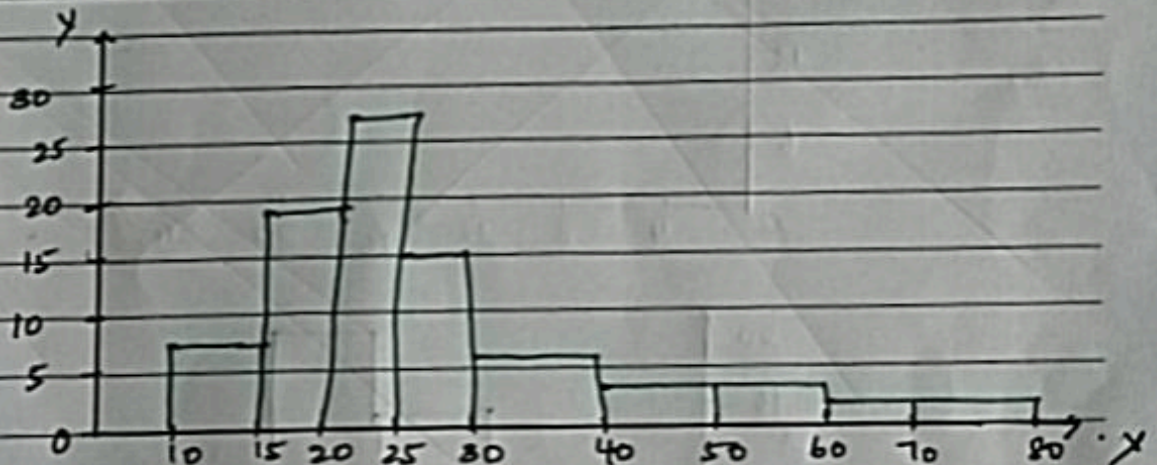
Represent the foll. data by means of a histogram.

Weekly wage (100 Rs.)	10-15	15-20	20-25	25-30	30-40	40-60	60-80
Number of workers	7	19	27	15	12	12	8



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Weekly wages.	No. of workers.	Magnitude of class	Height of rectangle.
10-15	7	5	7
15-20	19	5	19
20-25	27	5	27
25-30	15	5	15
30-40	12	10	$12/2 = 6$
40-60	12	20	$12/4 = 3$
60-80	8	20	$8/4 = 2$





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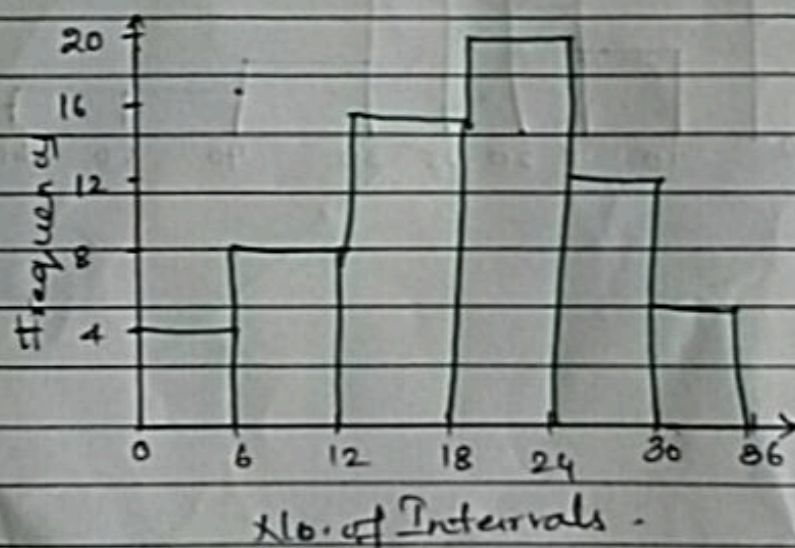
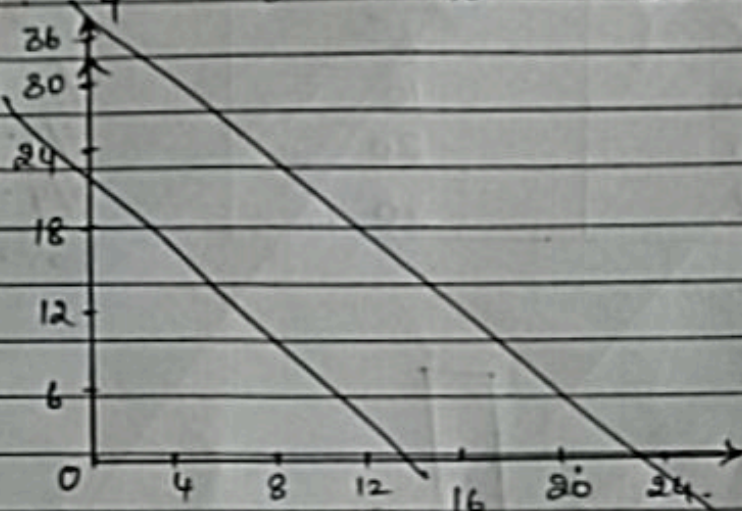
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Example:

Describe briefly the construction of histogram of a frequency distribution.

Class	0-6	6-12	12-18	18-24	24-30	30-36
Frequency	4	8	15	20	12	6





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Pie-Diagram:

Just as rectangles are used to represent the total magnitude and its various components, the circle may be divided into various sections or segments representing certain proportion or percentage of the various component parts to the total.

Steps for construction of pie-diagram.

- * Express each of the component values as a percentage of the respective total.

- * Since the angle at the centre of the circle is 360° , the total magnitude of the various components is taken to be equal to 360° .

$$\text{Degree of any component part} = \frac{\text{component value}}{\text{Total value}} \times 360^\circ$$

Example:

Draw a pie-diagram to represent the following data of proposed expenditure by a state govt. for the year 1997-98

Terms	Agriculture & rural development	Industries & Urban develop.	Health & Education	Miscellaneous
Proposed Expenditure (in millions Rs).	4200	1500	100	2500

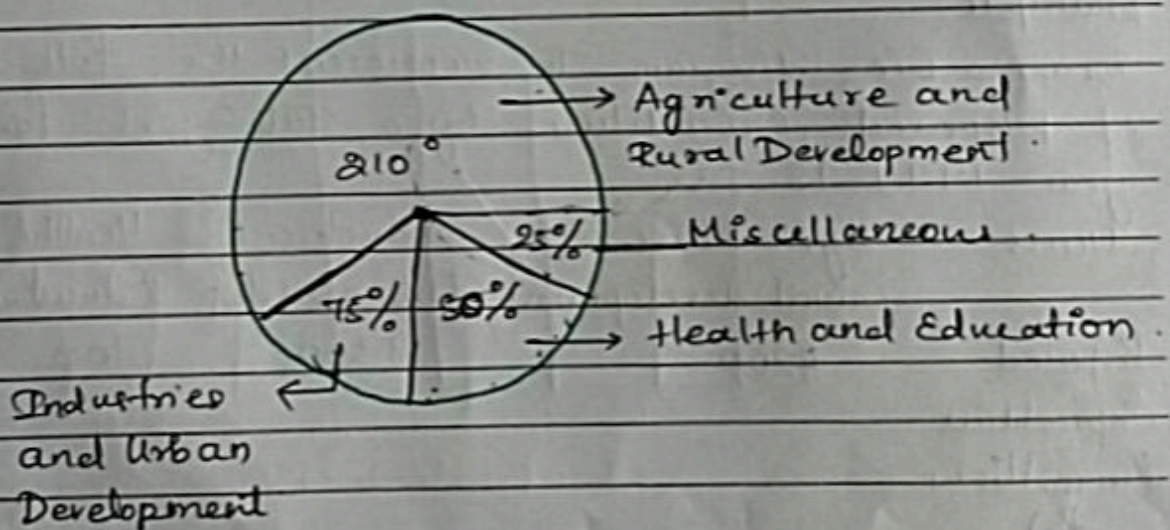


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Items	Proposed Expenditure	angle at the centre.
Agriculture and Rural Development	4200	$\frac{4200}{7200} \times 360^\circ = 210^\circ$
Industries and Urban Development	1500	$\frac{1500}{7200} \times 360 = 75^\circ$
Health and Education	1000	$\frac{1000}{7200} \times 360 = 50^\circ$
Miscellaneous	500	$\frac{500}{7200} \times 360 = 25^\circ$
Total	7200	





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Example:

In a class of 200 students, a survey was done to collect each student's favourite sports. The data is given below. Represent it in pie-chart.

Sport	Number of students	angle (or) Percentage.
Cricket	34	$\frac{34}{200} \times 360^\circ$
Football	50	$\frac{50}{200} \times 360^\circ = 90^\circ$
Badminton	24	$\frac{24}{200} \times 360^\circ$
Hockey	10	$\frac{10}{200} \times 360^\circ = 18^\circ$
Other	82	$\frac{82}{200} \times 360^\circ$
	<u>200</u>	

Science	6	$\frac{6}{30} \times 360^\circ = 72^\circ$
Physics	4	$\frac{4}{30} \times 360^\circ = 48^\circ$
Math	9	$\frac{9}{30} \times 360^\circ = 108^\circ$
Eng	21	$\frac{7}{30} \times 360^\circ = 84^\circ$
Hist.	4	$\frac{4}{30} \times 360^\circ = 48^\circ$
	<u>30</u>	

