DATA HANDLING

PIE CHART

CIRCLE GRAPH OR PIE CHART

The data which is represented by dividing a circle into sectors is known as pie chart. Pie graphs are circular, so they are also called circle graphs.

Each section of a pie graph shows a fraction of the total. It shows the relation of the part with the whole.

METHOD OF DRAWING PIE CHART

We follow the under mentioned steps to draw pie graphs (charts).

- (i) From the given data, we find the total of the frequencies.
- (ii) For each variable, we calculate the angle of the sector (i.e., angle at the centre of the circles). This angle is called central angle.
- (iii) We draw a circle of convenient radius.
- (iv) We draw the sectors coresponding to the central angles calculated in step-2.
- (v) Write drawn the names of the variables and their corresponding central angles in the sectors.
- **Note :** Sum of all the central angles is 360° Draw pie chart using protector and compasses.

READING OF PIE CHART

In this section, a pie chart will be given in that we would need to find the allocations for different heads. With the help of central angle (or sector area).

(i) Central angle for a component = $\left(\frac{\text{value of the component}}{\text{Sumof the value of all component}} \times 360\right)^\circ$

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Sum of the component values \times Central angle of the component 360°

(iii) Percentage value of a component = $\left(\frac{\text{Central angale of the component} \times 100}{360^\circ}\right)$

These formulae will be used to find the values of various components of the data from its pie-chart.

Ex.1 The main source of energy used by each house in a street is listed below :

Source of energy	Electricity	Solar	Gas	Oil
No. of houses	20	10	12	6

Represent the above data by a pie chart.

Sol. We know that central angle for a variabl = $\left(\frac{\text{value of the component}}{\text{sumof the value of all component}} \times 360\right)^{\circ}$

Total frequency = 20 + 10 + 12 + 6 = 48

Central angle for electricity $=\frac{20}{48} \times 360^\circ = 150^\circ$

Central angle for solar $=\frac{10}{48} \times 360^\circ = 75^\circ$

Central angle for gas $=\frac{12}{48} \times 360^\circ = 90^\circ$ Central angle for oil $=\frac{6}{48} \times 360^\circ = 45^\circ$



Ex.2 The table shows the way used by 300 students travel to school.

Made of Transport	Bus	Car	Motorbike	Walk
No. of students	100	60	90	50

Draw a pie chart to represent the above data.

Sol. Total number of student = 300

Central angle of a component =
$$\left(\frac{\text{value of the component}}{\text{sum of the value of all component}} \times 360\right)^{\circ}$$

Calculate of central angles

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Mode	No. of students	Central angle
Bus	100	$\frac{100}{300} \times 360^\circ = 120^\circ$
Car	60	$\frac{60}{300} \times 360^\circ = 72^\circ$
Motorbike	90	$\frac{900}{300} \times 360^\circ = 108^\circ$
Walk	50	$\frac{50}{300} \times 360^\circ = 60^\circ$



Total 300

Here, $120^{\circ} + 72^{\circ} + 108^{\circ} + 60^{\circ} = 360^{\circ}$

Now, draw pie chart for it using protractor and compasses.

It should always be verified that the sum of the central angles is 360°.

Ex.3 The pie-chart shown in fig. represents the expenditures of a family on different items. Find the percentage expenditures on different items by reading the pie-chart.



Sol. We know that

Percentage value of a component = =
$$\left(\frac{\text{Central angale of the component} \times 100}{360^\circ}\right)$$

In this case, we have

Percentage expenditure on an item = $\left(\frac{\text{Central angale of the component} \times 100}{360^\circ}\right)$

Percentage expenditures on various items are computed in the following table :

ITEMS	CENTRAL ANGLE	PERCENTAGE EXPENDITURES.
Food	220°	$\frac{220^{\circ} \times 100}{360^{\circ}} = 61.11\%$
Housing	60°	$\frac{60^{\circ} \times 100}{360^{\circ}} = 16.7\%$
Clothing	50°	$\frac{50^{\circ} \times 100}{360^{\circ}} = 13.9\%$
Fuel	20°	$\frac{20^{\circ} \times 100}{360^{\circ}} = 5.5\%$
Others	10°	$\frac{10^{\circ} \times 100}{360^{\circ}} = 2.8\%$

Ex.4 Each of the following pie charts gives you a different piece of information about your class. Find the fraction of the circles representing each of these information.



- Sol. The fraction of circle representing
 - (i) Number of girls $=\frac{50}{100} = \frac{1}{2}$. Number of boys $=\frac{50}{100} = \frac{1}{2}$.
 - (ii) The fraction of circle representing Number of students who hate

Mathematics = $\frac{15}{100} = \frac{3}{20}$.

Number of students who love Mathematics $=\frac{100-15}{100}=\frac{85}{100}=\frac{17}{20}$.

Ex.5 Answer the following questions based on the pie chart given below :

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- (i) Which type of programmes are viewed the most?
- (ii) Which two types of programmes have number of viewers equal to those watching sort channels?
- **Sol.** (i) Entertainment programmes are viewed the most.
 - (ii) News and information channels together (10% + 15% = 25%)have equal number of viewers to watching sports channels.

