Pie Chart

Pie chart is a circular chart divided into sectors in which the arc length, its central angle and area are proportional to the quantities that it represents.

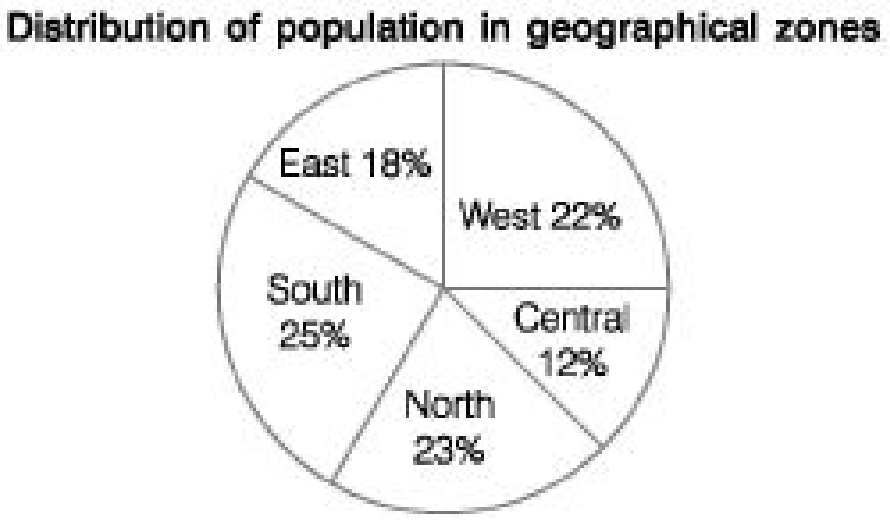
Pie chart is called so because of its shape. Each slice of pie is allowed to each category and shows the por- tion of the entire pie.

In the questions of pie chart, the total quantity is distributed over a total angle of 360° or 100%. Here, the data can be plotted with respect to only one parameter.

Uses of pie charts are restricted to represent limited type of information.

Pie chart is also useful for representing proportions or percentages of various elements with respect to the total quantity.

The following pie chart gives the distribution of the population in different aeoara Dhical Zones



From the above pie chart, we *can calculate the following*

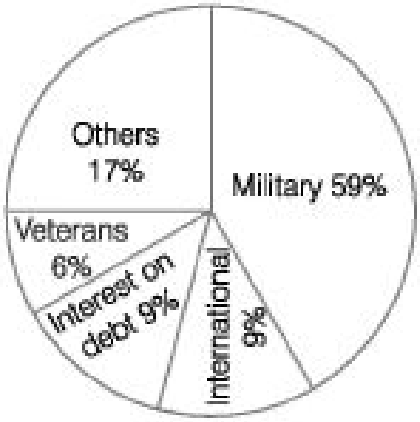
Population in any zone when the total population is given.

Population of any zone as a percentage of that of another zone.

Percentage increase in the total population, given that percentage increase in the population of one or more zones.

Directions (Examples 1-2) *Refer to the following pie chart and answer the questions that follow.*

National budget expenditure in the year 2012
(Percentage distribution)



Ex. 1 In year 2012, if India had a total expenditure of ? 120 billion, then how many billions didit spend on interest on debt?

Sol. Total expenditure = 120 billion

$\therefore$ Expenditure of interest on debt = 9% of 120 = $\frac{9}{100} \times 120 = ₹\ 10.8$ billion

Ex. 2 If ? 9 billion were spent in year 2012 for veterans, then what would have been the totalexpenditure for that year (in billions)?

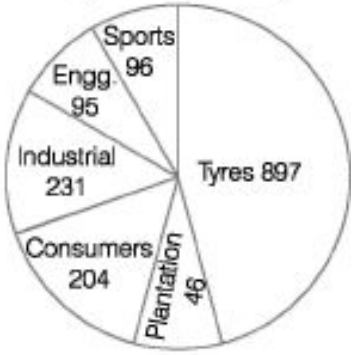
Sol. ₹ 9 billion were spent for veterans. It has 6% of the total expenditure for year 2012.

Hence, total expenditure = $\frac{9}{6} \times 100 = ₹\ 150$ billion

Directions (Examples 3-5) *Refer to the following pie charts and answer the questions that follow.*

Sales by location of company
(In million pounds)

Sales by product
(In million pounds)



Total sales = 1569 million pounds

Ex. 3 If in the next year, the sales of sports goods were expected to double assuming that the total sales do not change, what would be the percentage share of sports goods in the total sales?

Sol. Total sales = 1569 million pounds

Sports goods sales next year = $2 \times 96 = 192$ million pounds

Therefore, percentage share of goods sales = $\frac{192}{1569} \times 100\% \approx 12\%$

Ex. 4 If in the subsequent year, consumers are to increase their shares by 7%, then assuming that the total sales remain constant, the consumer sales would have to increase by how many million of pounds?

Sol. Currently, share of consumer products = $\frac{204}{1569} \times 100\% = 13\%$

Let increase in consumer products sales be x million.

Therefore, if the share of consumer products increases by 7%, then

$$\frac{204 + x}{1569} \times 100 = 20 \Rightarrow 20400 + 100x = 31380$$

$$100x = 31380 - 20400$$

$$100x = 10990 \Rightarrow x = 110 \text{ million pounds (approx)}$$

Ex. 5 If 20% of the tyre sales were in the EEC countries, then what was the value of sales of other products in the EEC countries in million of pounds?

Sol. 20% of tyre sales = $\frac{20}{100} \times 897 = 179.4$ million

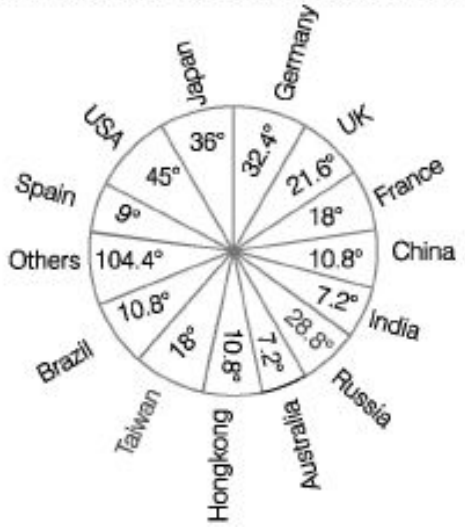
EEC sales = 420 million = Sales of tyre + Sales of other products

420 million = 179.4 + Sales of other products in EEC

Sales of other products in EEC = 420 - 179.4 = 240.6 million pounds (approx)

Directions (Examples 6-10) *Refer to the following pie chart and answer the questions that follow.*

Countrywise global exports presentation



Total = 72000 billion

Ex. 6 By how much does the value of the exports of USA exceed that of Germany?

Sol. The difference in the angles subtended by USA and Germany $= 45° - 32.4° = 12.6°$

$\therefore$ Difference in the exports of USA and Germany (in billion)

$$= 72000 \times \frac{12.6°}{360°} = 2520 \text{ billion}$$

Ex. 7 The difference in the values of the exports of Japan and France is how many times that of UK and Taiwan?

Sol. The difference in the angles of the export of Japan and Prance

$36° - 18° = 18°$ ...(i)

The difference in the angles subtended by UK and Taiwan

$21.6° - 18° = 3.6°$ ...(ii)

Clearly, Eq. (i) is 5 times of Eq. (ii).

Ex. 8 The value of the exports of the OPEC countries is how much more than the value of the exports of India and Australia put together, given that OPEC has a 20% share in the value of the exports of others?

Sol. Value of the exports of India and Australia

$$= 7.2° + 7.2° = 14.4° \quad \text{...(i)}$$

Value of exports OPEC countries

$$= 104.4° \times \frac{20}{100} = 20.88° \quad \text{...(ii)}$$

$$\text{Difference} = 20.88° - 14.4° = 6.48°$$

$\therefore$ $$\text{Required value} = 72000 \times \frac{6.48°}{360°} = 1296 \text{ billion}$$

Ex. 9 If exports of developing countries accounted for 36% of the total worldwide exports, then what is the value of the exports of Japan as a percentage of the exports of the developing countries?

Sol. Exports of developing countries = 36% of total exports

$$\text{Exports of Japan} = \frac{36}{360} \times 100\% = 10\% \text{ of total exports}$$

$$\therefore \quad \text{Required percentage} = \frac{10}{36} \times 100\% = 0.2777 \times 100\% = 27.77\%$$

Ex. 10 Considering 'others' as a single country, what is the number of countries whose exports are more than the average exports per country?

Sol. The total number of countries = 14

$$\text{Average angle subtended by each country} = \frac{360^\circ}{14} \approx 25.7^\circ$$

Only USA, Japan, Germany, Russia and others are greater than 25.7.

Hence, our answer is 5.