Chapter-5

Uses of data

Q7F5Y1

5.1 Let us look for Data

Data are usually collected in the context of situation that we want to study. For example, how many people are there in each house of a village? What is the number of men and women in each house and what are their educational qualification? etc. To find these answers we must have to go to every house to collect data. The data should be organised in a systematic manner and then analyse it according to our purpose.

The students may also collect data on the number of members of the family of the students of that school and analyse it.

Data are represented graphically to give a clear idea of what it represents. Let us revise different types of graphs that we have learnt in earlier classes.

5.2 Pictograph :

In this graph, data are represented usually using symbols.

Let us observe the following example–

Following is the list of number of books sold in first 4 days of one week in a bookshop

Mon	📖📖📖📖📖
Tue	📖📖📖📖📖📖
Wed	📖📖📖
Thurs	📖📖📖

Here we take 📖 = five books

(i) On which day of the week most books are sold?

(ii) What is the total number of books sold on Tuesday and Wednesday together?

5.3 Bar graph :

In a bar graph data are displayed using bars of uniform width, their heights being proportional to the respective values.

Let us consider the following example–

The number of students for the last 5 years of a school is given in a table in the next page.

Year	Number of students
2014	250
2015	330
2016	300
2017	280
2018	450

Table-1

The greatest value in the table is 450. So, the last number of the scale must be greater than 450. Along Y-axis divisions are made in a gap of 50. i.e. 1 unit = 50 students is taken. The bar graph is drawn taking years along X-axis and taking number of students along Y-axis (fig 5.1)

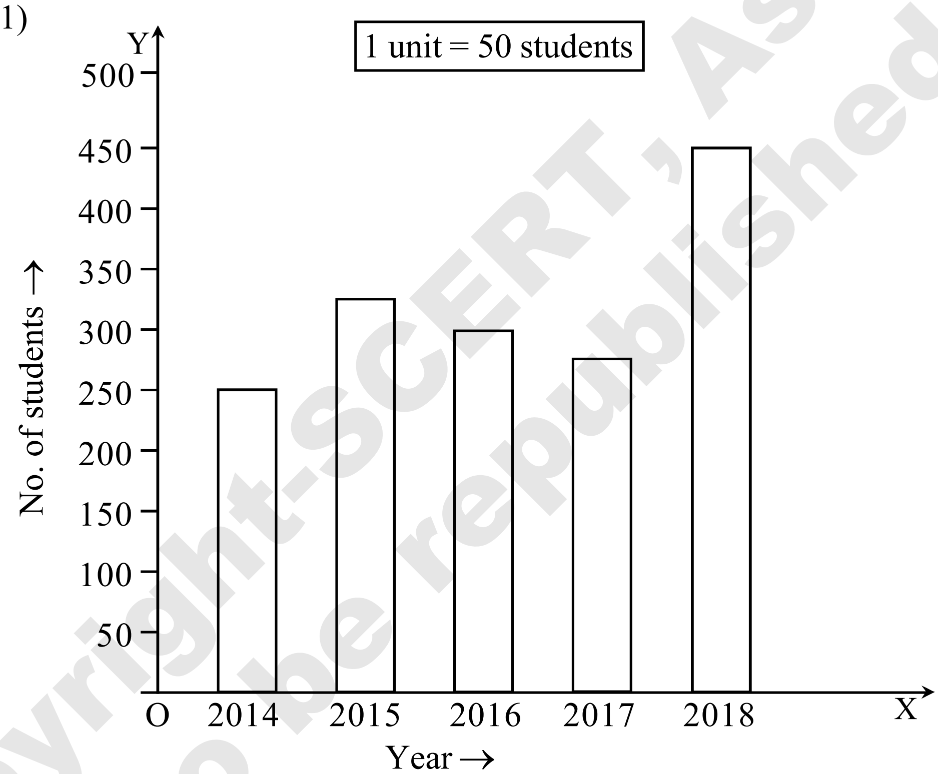


Figure-5.1

Look at the above bar diagram and answer the following questions :

(i) In which year the number of students are maximum and how many?

(ii) What is the difference between the maximum and minimum number of students?

(iii) In which years the number of students are 300 or above?

5.4 Double Bar Graph :

The double bar graph shows two sets of data simultaneously. It is useful for the comparison of the data.

Let us see the above mentioned example with the help of a double bar graph–

Year	boys	girls
2014	100	150
2015	170	160
2016	150	150
2017	150	130
2018	200	250

Table-2

Let us express the data with the help of double bar graph–

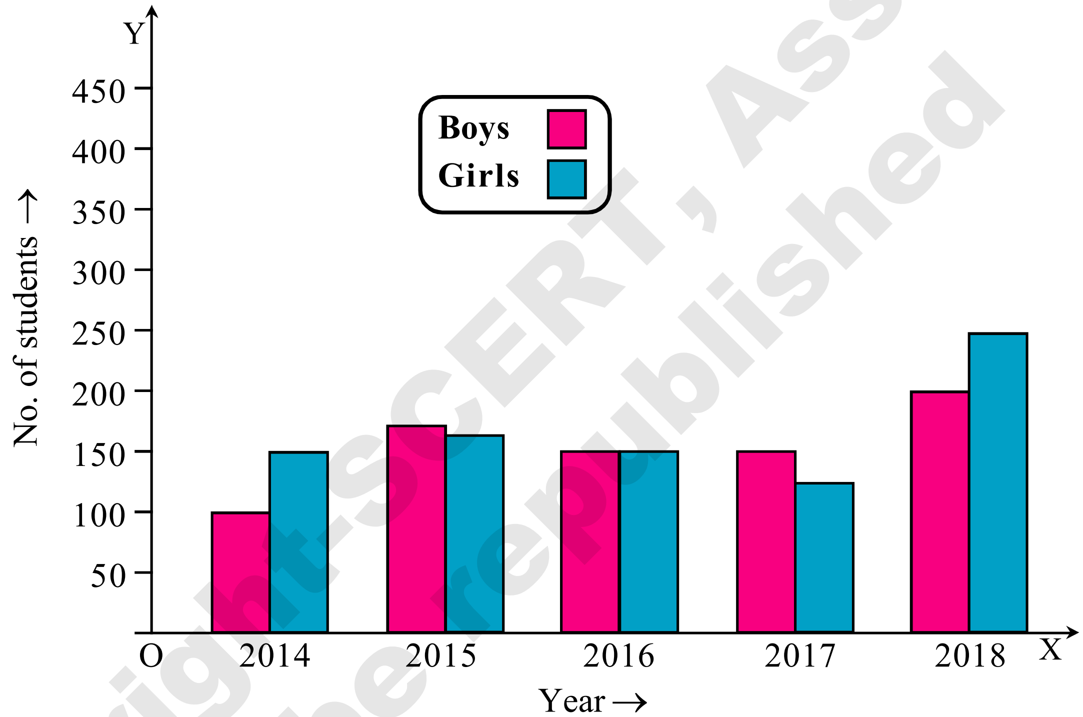


Figure-5.2

(i) In which year the number of boys are maximum?

(ii) In which year the number of boys are minimum?

(iii) In which year the number of boys and girls are same ?

5.5 Organisation of data :

A group of students was asked about their favourite games and the answer was as follow :

Cricket, cricket, football, hockey, hockey, football, kabaddi, football, hockey, hockey, football, hockey, cricket, cricket, cricket, football, hockey, cricket, kabaddi, kabaddi, cricket, football, cricket, hockey, kabaddi, kabaddi, football.

Data collected in this way from the main source are called **Primary Data**.These data are in unorganised form. In order to arrive at a meaningful conclusion, the data need to be arranged systematically. Let us arrange the data using tally mark.

Number of Game	Tally Marks	Number of students
Cricket	卌 |||	8
Football	卌 ||	7
Hockey	卌 ||	7
Kabaddi	卌	5

Total = 27

Table-3

The number of tally marks for each game gives the number of students who like that particular game. These numbers are called ***frequency*** of that particular game.

Frequency gives us the number of times that a particular entry occurs.

In the above table frequency of students who like Cricket is 8, for Kabaddi it is 5 and for Football and Hockey the frequencies are 7 each.

The table which gives us the number of times an entry occurs is called a ***frequency distribution table***.

5.6 Grouping of data :

Consider the following example:

Ages (in years) of 60 people are as follows :

37, 61, 4, 19, 21, 16, 6, 12, 23, 29, 35, 39, 52, 13, 22, 31,

36, 42, 8, 56, 63, 57, 9, 18, 24, 11, 32, 41, 46, 5, 14, 17,

26, 33, 44, 28, 3, 45, 59, 30, 15, 20, 25, 34, 38, 27, 43, 55,

47, 51, 64, 68, 48, 27, 49, 54, 66, 65, 53, 7

If we prepare a frequency distrubution table for each observation, then the table would be too long and therefore, for our convenience we make groups of observations like, 0 – 10, 10 – 20 and so on and prepare a frequency distribution table of the ages falling into each group.

Thus we can find the frequency distribution table of the above data as shown in the next page.

Group	Tally Marks	Frequency
0 – 10	𝍸 ||	7
10 – 20	𝍸 ||||	9
20 – 30	𝍸 𝍸 |	11
30 – 40	𝍸 𝍸	10
40 – 50	𝍸 ||||	9
50 – 60	𝍸 |||	8
60 – 70	𝍸 |	6

Total = 60

Table-4

Data presented in this manner are said to be grouped. The distribution table thus obtained is called ***grouped frequency distribution table***.

It becomes helpful to draw any meaningful conclusions from such distribution like –

(i) Most of the people are in between 20 and 30 years of age.

(ii) There are 14 people whose ages are above 50 years.

(iii) There are 27 people whose ages are less than 30 years.

Let us know :

(i) Each of the groups 0 – 10, 10 – 20, 20 – 30 etc. is called a ***Class Interval*** (or briefly a class).

(ii) Now there is a possibility that10 occurs in both of the classes 0 – 10 and 10 – 20. To avoid this ambiguity the number that occurs in either of two consecutive classes is included in the 2nd one. For example, 10 will be considered in the class 10–20, not in 0–10, Similarly, 20 will occur in the class interval 20 – 30, but not in 10 – 20.

(iii) For any class interval like 10 – 20, 10 is called the **lower limit** and 20 the **upper limit**.

(iv) The difference between the upper limit and lower limit is called as **class width**. For example, Class width of 0 – 10 is 10 – 0 = 10; class width of 10 – 20 is 20 – 10 = 10, etc. The class width in the above example is 10.

Example 1 :

Observe the Table– 4 and answer the following questions.

(i) What is the class width of the class intervals?

(ii) Which class has the highest frequency?

(iii) Which class has the lowest frequency?

(iv) What is the upper limit of the class interval 40 – 50?

(v) Which two classes have the same frequency?

Solution :

(i) Class width of the class intervals = 10,
(since 10 – 0 = 10, 20 – 10 = 10, 30 – 20 = 10...)

(ii) The class 20 - 30 has the highest frequency.

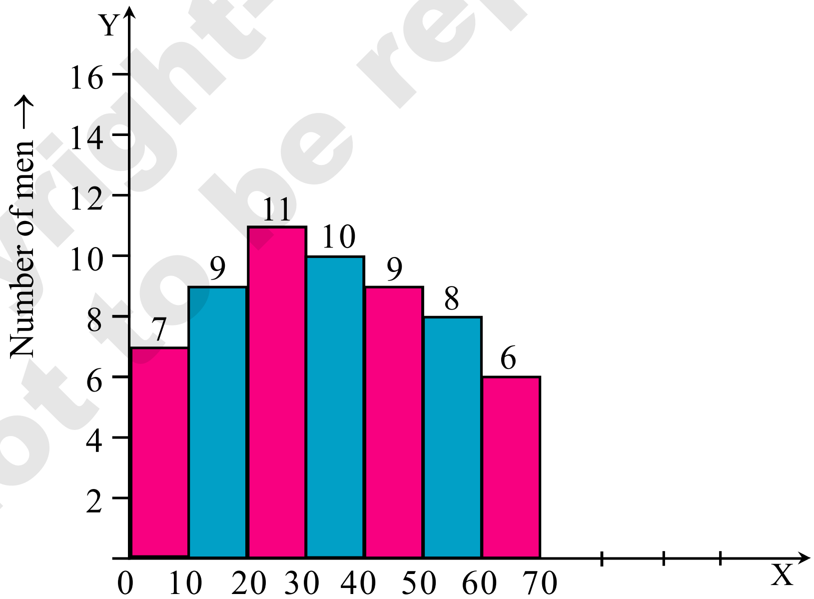
(iii) The class interval 60 - 70 has the lowest frequency.

(iv) Upper limit of the class interval 40 – 50 is 50.

(v) The two classes 10 - 20 and 40 - 50 have the same frequency.

5.7 Histogram :

We can draw a graph as shown below using the frequency distribution table displayed in table-4.



Ages of men →
Figure-5.3

Note the difference between the figures 5.1 and 5.3.

In figure 5.3 we have represented the age groups (i.e. class interval) on the horizontal axis. The vertical axis represents the heights of the bars showing the frequencies of the class intervals. There is no gap between the bars as there is no gap between the class intervals.

The graphical representation of data in this manner is called a **Histogram**.

On the other hand in Figure 5.1, bars are used to show the number of students for different ages, that is, there is no relation between the data of one year with the data of another year. So, there is no need to use the bars touching each other.

Example 2 :

Marks obtained by 78 students in Mathematics Olympiad Examiation of a centre is shown in the adjoining table.

class interval (mark obtained)	frequency (no. of students)
0 - 10	2
10 - 20	14
20 - 30	18
30 - 40	10
40 - 50	13
50 - 60	8
60 - 70	6
70 - 80	7
Total	78

Table-5

Let us express the table with the help of histogram.

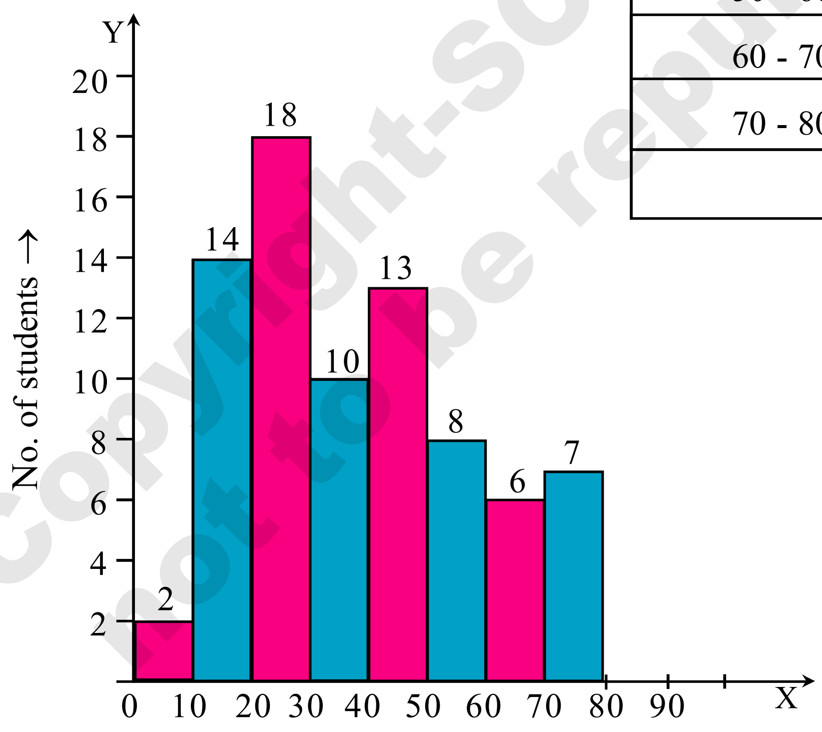


Figure-5.4

Answer the following questions by observing the histogram.

(i) How many students obtained more than 30 but less than 60 marks?

(ii) How many students obtained 60 marks or more than 60 marks ?

(iii) Which class interval has the maximum number of students?

Solution :

(i) 31 (ii) 13 (iii) 20-30

Exercise 5.1

1. The choice of 46 students of class VIII about four colours namely white (W), red (R), black (B) and yellow (Y) is given in the table below. It is given that each student is allowed to choose one colour only.

W,	R,	R,	Y,	B,	B,	B,	Y,	R,	W,	W,	R
Y,	B,	B,	Y,	B,	R,	R,	W,	B,	B,	R,	Y,
Y,	B,	W,	Y,	Y,	R,	W,	W,	R,	R,	B,	B,
R,	Y,	B,	W,	W,	B,	Y,	B,	W,	W		

Prepare a frequency distribution table using tally marks and draw a bar graph to explain this.

2. The monthly savings (in rupees) of 35 members of 'Jonaki Self Help Group' are as follows

110,	125,	110,	140,	150,	150,	150,	110,	180,	180,	110,
140,	140,	120,	120,	120,	140,	140,	170,	175,	175,	145,
145,	140,	175,	120,	125,	130,	135,	135,	155,	145,	145,
175,	185.									

Taking 110 - 120, 120 - 130, 130 - 140 .... as class intervals prepare a frequency table using tally marks.

3. Draw a histogram from the frequency table with the data given in Q. No. 2 and answer the following questions.

(i) Which class interval has the maximum number of members?

(ii) How many members save150 or more?

(iii) In which class intervals, there are equal number of members?

4. The numbers of the students of class VIII and the study time they spend daily are given in the histogram shown in the next page (Figure 5.5).

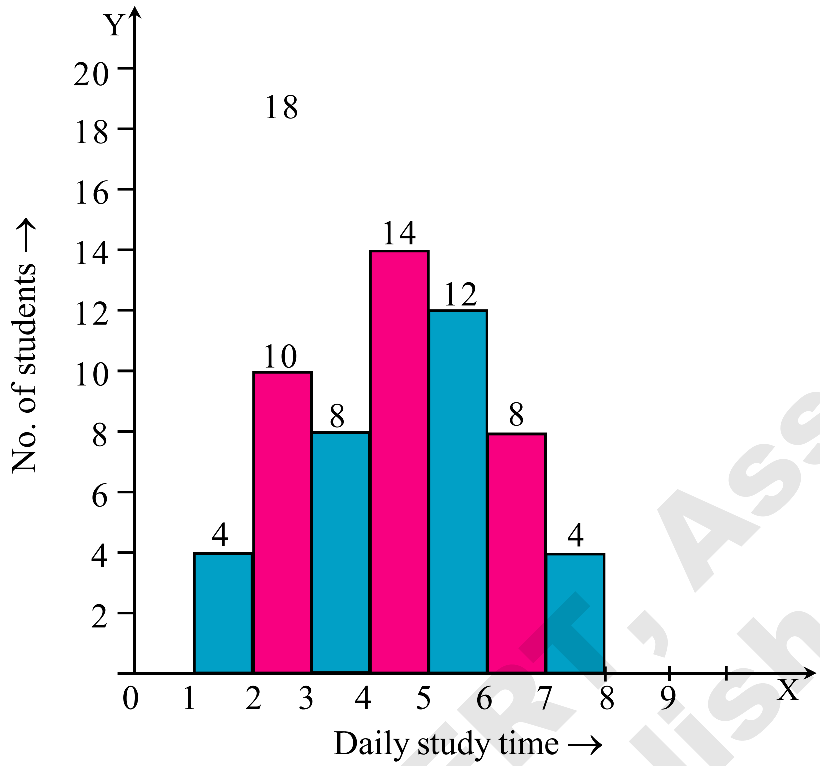


Figure-5.5

Answer the following with the help of the histogram :

(i) How many hours do most of the students study daily?

(ii) How many students study for more than 5 hours daily?

(iii) How many students study for less than 4 hours daily?

5. The heights (in cm) of 30 students are as follows :

136, 138, 140, 140, 154, 160, 158, 147, 139, 153, 162,
162, 173, 137, 142, 156, 162, 164, 185, 143, 145, 182,
152, 163, 174, 138, 142, 152, 144, 146.

By taking appropiate class intervals prepare a frequency distribution table using tally marks.

5.8 Circle Graph or Pie Chart

Let us see what Animesh does in 24 hours :

(i)	Sleep	— 8 hours
(ii)	Studies	— 5 hours
(iii)	Duration in school	— 6 hours
(iv)	Time for playing	— 2 hours
(v)	Others	— 3 hours

Daily activities of Animesh can be shown easily with the help of a circle graph.

5.8.1 Drawing Pie Chart :

Let us see how we can represent the daily activities of Animesh as mentioned in the above example, in the sectors of a circle.

We know that the circumference of a circle produces 360^0 angle at the centre.

Let us establish a relation between time and degree by comparing 24 hours with 360^0.

(i) Sleeping hours of Animesh = 8 hours. So the angle at the centre = $\frac{8}{24} \times 360^0 = 120^0$

(ii) Time of study = 5 hours = $\frac{5}{24} \times 360^0 = 75^0$

(iii) Hours spent in school = 6 hours = $\frac{6}{24} \times 360^0 = 90^0$

(iv) Time for play = 2 hours. = $\frac{2}{24} \times 360^0 = 30^0$

(v) Others = 3 hours. = $\frac{3}{24} \times 360^0 = 45^0$

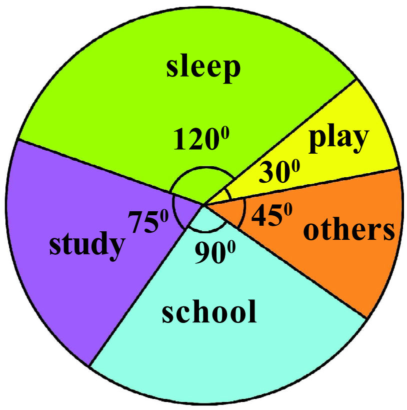


Figure-5.6

After determining the angles at the centre, a circle is drawn by taking a convenient radius and then the sectors are marked with the help of a protractor.

The diagram, in which data are represented in sectors of a whole circle, is called **Circle graph or Pie chart**. Thus, like bar diagram, data can be represented by Pie chart or circle graph also.

Example 3 : The batting display of 4 students of a school in the inter school cricket competition is as follows :

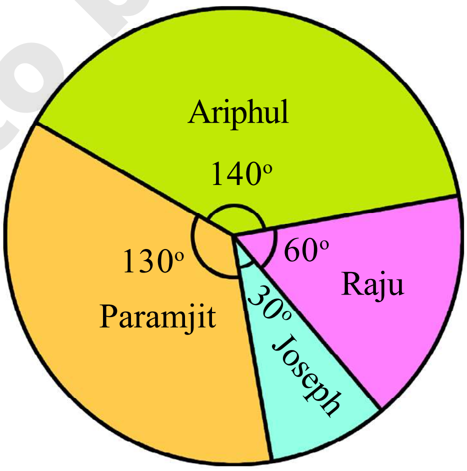
(i) Ariphul	70 Run
(ii) Paramjit	65 Run
(iii) Raju	30 Run
(iv) Joseph	15 Run
Total	180 Run

Draw a Pie chart for the above data.

Solution : At first we find out the central angles of the sectors. Here total runs = 180. Then we get the following table.

Name of Batsman	Collected run	Ratio	Central angle
Ariphul	70	$\frac{70}{180}$	$\frac{70}{180} \times 360^0 = 140^0$
Paramjit	65	$\frac{65}{180}$	$\frac{65}{180} \times 360^0 = 130^0$
Raju	30	$\frac{30}{180}$	$\frac{30}{180} \times 360^0 = 60^0$
Joseph	15	$\frac{15}{180}$	$\frac{15}{180} \times 360^0 = 30^0$

Now, let us represent the table with the help of a pie chart.



Example 4 : The saving and expenditures (in percentage) on different heads from the monthly salary of a man are as follows :

Savings = 25%

Children's education = 25%

Food = 30%

Others = 20%

Express the data in a pie-chart.

Solution : Let us find out the central angle for each head (in percentage).

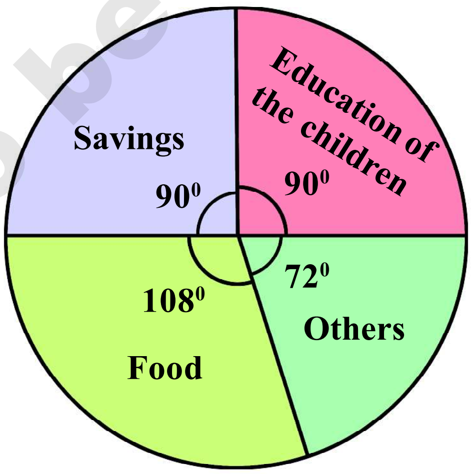
$$\text{Savings} = 25\% \text{ of } 360^0 = 360^0 \times \frac{25}{100} = 90^0$$

$$\text{Children's education} = 25\% \text{ of } 360^0 = 360^0 \times \frac{25}{100} = 90^0$$

$$\text{Food} = 30\% \text{ of } 360^0 = 360^0 \times \frac{30}{100} = 108^0$$

$$\text{Others} = 20\% \text{ of } 360^0 = 360^0 \times \frac{20}{100} = 72^0$$

Now, let us express the angles in a pie chart–



Exercise 5.2

1. The details of favourite sports of 60 persons are given below. Draw a Pie-chart from the data.

Name of sports	Number of persons
Cricket	20
Football	18
Kabaddi	12
Badminton	10

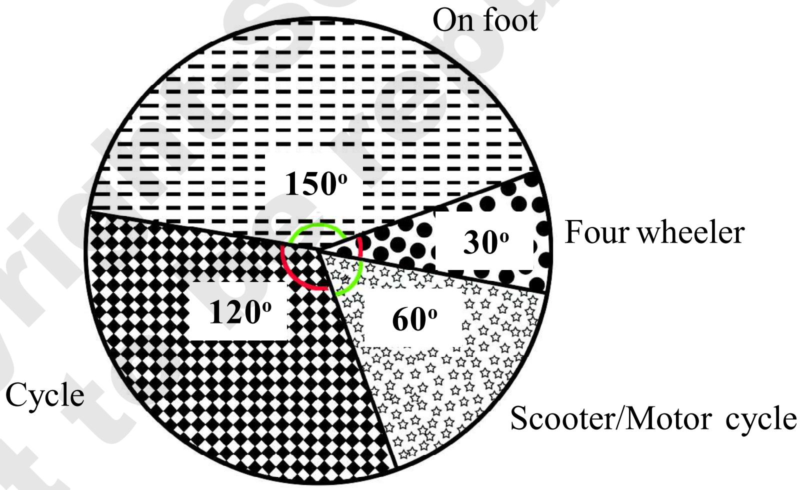
2. 600 persons were present in a playground to watch a football match. In the following Pie chart the numbers of persons coming on different vehicles on foot are shown.

   Answer the following from the figure.

   (i) How many persons came on foot?

   (ii) What is the difference between the persons nummers of who came using Scooter/ Motor cycles and the persons who came on Four wheeler.

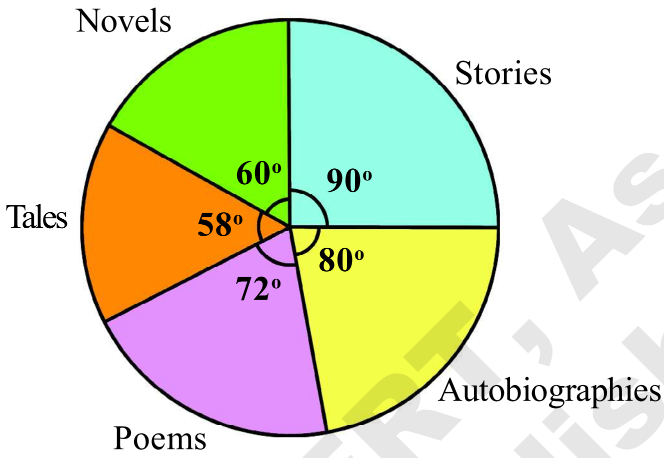
   (iii) What type of vehicles were used by 200 persons?



3. In a school, among 720 students the number of students of classes Six, Seven, Eight, Nine and Ten are given below. Express the data in Pie-chart.

Class	Six	Seven	Eight	Nine	Ten	Total
No. of students	120	140	200	80	180	720

4. A Pie chart is drawn for 180 students of a class who like stories, novels, tales, poems and autobiographies. Answer the following from the figure :
   (i) How many students like to read novels?
   (ii) What subject do most of the students like to read and what is their number?
   (iii) What is the total number of students who like to read poems and autobiography?



5. The numbers of trees in a fruits' garden are as follows –

Mango	30
Jackfruit	50
Guava	20
Total	100

Determine the central angles of each sector and then draw a pie-chart with the data.

5.9 Chance and Probability :

Observe the following sentences –

(i) There is no chance of raining in the next three days.

(ii) The pedastrian, walking on the footpath was hit and killed by a car after unfortunately loosing control.

(iii) There is a strong possibility to form Government in the next election by the party 'Jatiya Gana Morcha.'

(iv) When two one rupee coins are tossed simultaneously then it is sure get at least one head.

(v) It is dangerous to touch by hand an electric wire lying torn.

In our daily life we often come across such types of conversations. Such utterances express feelings like fear, doubt, belief etc. We find it difficult to take certain decision when we do not have complete knowledge or data about any matter. Yet, for the sake of necessity, we have to take a decision to get a result on the basis of the partial knowledge or information we have.In this case, we depend upon some uncertain and secret causes (which the common people term as their luck or destiny).

When we guess that there is no possibility of rain in the next two or three days, we decide this based on the previous experiences about nature of the weather observed over the last few days. This means that in most cases of the present weather conditions that happened in the past, there were no rain. So, it is guessed that there is no possibility of rain, in the next two or three days. This is only a guess. However, it may rain also, because even in this type of weather also it was not without at all.

The incident in case of the pedestrian is totally accidental and unwanted. He used to walk in the footpath earlier also. He never saw anyone hit by cars or he himself never faced such a situation while walking on the footpath. Therefore he walked on the footpath without any fear and thought. Yet the accident occurred.

To think of the chances of forming the government by a particular political party, we generally depend on Opinion Poll. If the randomly collected opinions from the public go in favour of the concerned party, then we can guess they would form the government.

Thus we can cite other examples from which chances can be guessed based on some data that are available, (although all data may not be available). On the whole, to guess something we need some data or our previous experiences obtained from the experiments and investigations conducted in similar situation.

5.10 Random Experiment and Outcomes

Let us take one familiar example–

You must have noticed what an umpire does to decide which team will bat or bowl first before a cricket match starts. He usually tosses a coin and asks both the captains to predict the result. The captain who is correct gets the chance to decide. That the ways such as tossing a coin, rolling a dice etc. are called **random experiment**. The characteristic of this experiment is (i) It can be done again and again in the same way. (ii) When a coin is tossed, its one side is in upper direction and other side is in lower direction. But, we cannot say at the beginning which side of the coin will be in upper or in lower direction. That means, the possibilities to get a head or a tail are equal.

Is there any out come other than head and tail in the random experiment of tossing the coin. From our experience we can say that there is no other outcome except head or tail. So, when a coin is tossed head and tail are the only out comes. Head is indicated as ‘H’ and tail is indicated as ‘T’.

Therefore, some fixed outcomes are associated with any random experiment.

Simultaneously tossing of two coins is also a random experiment. Can you tell the outcomes of this experiment? Observe that, the outcomes of tossing a coin are H and T. Now if we get H in the first, we may get H in the 2nd also. When we toss two coins simultaneously and get H for both tosses as outcomes, the result is expressed as HH.

Therefore, the results related to this experiment are as HH, HT, TH, TT.

Think and Say

(a) Is the throwing of a dice in a Ludo game a random experiment ? What will be the outcomes of this experiment?

(b) There is a staircase to come down from a two storied building. If, in stead of using the staircase, a man jumps down, what may be the possible results? Are the uncertainties of outcomes involved in jumping down and in using the staircase is the same? How would you decide in your case?

(c) Two coins are tossed together.

(i) Will the chances of getting two heads together or getting only one head be same?

(ii) Will the chance of getting two heads or two tails together be same?

5.11 Equally likely outcomes :

We already said that when a coin is tossed, the chances of getting heads and tails are equal if the coin is unbiased and is tossed neutrally.

But every time we toss we get only one outcome head or tail.

Let us see what happens, when the number of tosses are gradually increased.

Number of tosses	Number of head	Number of tail
10	3	7
20	7	13
30	12	18
40	18	22
50	24	26

Notice that as the number of tosses increases the numbers of heads and tails are going to be nearly equal. i.e. the outcomes of getting head and tail are equally likely.

Do yourself :

Toss a die 100 times and make a table of the results as given.

Number of tosses	Number of outcomes					
	1	2	3	4	5	6
100						

Observe the results. Examine whether they are equally likely outcomes.

5.12 Linking chances to probability :

Let us again consider the random experiment of tossing a coin.

A coin has two sides with head on one side and tail on another. If the coin is tossed in air and allowed to fall in a plane surface, then any of the two will be on upper side. i.e the upper side may be either head or tail. i.e total number of outcomes will be two. Since there is head in only one side, so chance of getting a head is 1. Similarly, chance of getting a tail is1.

In the experiment the number of total outcomes is 2 and number of getting head is1, both are fixed.

Therefore, $\dfrac{\text{Number of getting head}}{\text{Total number of outcomes}} = \dfrac{1}{2}$

This ratio is also fixed and it gives a relative measure of getting head with respect to the total outcomes obtained from the toss of the coin. This ratio is called the **probability of getting heads**.

Thus, in the experiment of tossing a coin, the chance of getting head is 1 and therefore the probability of getting head is $\frac{1}{2}$.

Similarly, in the experiment of tossing of a coin, the chance of getting tail is 1 and therefore probability of getting tail is $\frac{1}{2}$.

Now, let us consider another example of a random experiment.

Let there be 10 marbles in a bag of which 3 are black, 5 are yellow and 2 are of white colour. Mix the marbles throughly and take out a marble randomly. In how many ways can you select the marble and what are the chances of getting a red marble?

First observe that there are 10 marbles in the bag. Therefore the marble selected may be anyone of the 10 marbles. i.e. total outcomes are 10. On the other hand, there are two red marbles in the bag. Therefore, anyone of these two red marbles may come to your hand. i.e chances of getting a red marble is 2.

In this way, probability of getting a red marble = $\frac{2}{10} = \frac{1}{5}$

Similarly chances of getting a black marble is 3 and probability will be $\frac{3}{10}$

Now, you think yourself and say what are the chances of getting a yellow marble from the bag and its probability.

Remember : Probability of an outcome in a random experiment =

$$\frac{\text{Number of chances the outcome happens in the experiment}}{\text{Total number of outcomes in the experiment}}$$

Example 5 : Consider a die which has two faces each with one dot, three faces each with two dots and the remaining faces with three dots. When the die is rolled, find the probability such that (i) One dot is obtained. (ii) Two dots are obtained. (iii) Three dot is obtained.

Solution : (i) Since there are six faces of the die and any one side of it will be upper side when tossed, therefore, the total number of outcomes is 6. On the other hand, there are two faces having one dot. So, the number of chances of getting one dot is 2. Then the probability of getting one dot is $\frac{2}{6} = \frac{1}{3}$

(ii) Similarly the number of chances of getting two dots is 3 and so probability of getting two dots is $= \frac{3}{6} = \frac{1}{2}$

(iii) The number of chances of getting three dots is 1 and therefore probability of getting 3 dots is $\frac{1}{6}$. Note that there is no faces of the die having 4 dots.

Therefore, probability of getting 4 dots is $\frac{0}{6} = 0$

Example 6 : Consider a coin, which has head on both sides. When the coin is tossed what is the probability of getting head. Again, what is the probability of getting tail?

Solution : When the coin is tossed, any side of the coin may be on upper side. Therefore total number of outcomes is 2.

Again, since there are heads on both sides, therefore chances of getting heads is also 2.

$\therefore$ Probability of getting heads. $= \frac{\text{Chances of getting head}}{\text{Total number of outcomes}} = \frac{2}{2} = 1$

Note here that no matter how and how many times the coin is tossed, the outcome head is sure. Hence the probability of getting a head is one. In other words **the probability of a sure outcome is 1.**

On the other hand,

$$\text{probability of getting tails} = \frac{\text{Number of chances of getting tails}}{\text{Total number of outcomes}} = \frac{0}{2} = 0$$

5.13 Outcomes and Events

The collection of outcomes of a random experiment makes an **event**. The outcomes associated with the tossing of a coin are head and tails. Now,

(i) The outcome of getting of head is an event.

(ii) The outcome of getting of tail is also another event.

(iii) The outcome of getting any one of head or tail is also an event.

(iv) The outcome of not getting a head or a tail is also an event.

But the outcome of event (iv) is impossible, because one side of the coin will be always upper side whenever tossed. This type of event is called **impossible event**.

Similarly, in case of throwing a die, the possible outcomes are 1, 2, 3, 4, 5, and 6. Each of these outcomes here makes an event.

Sometimes two or more outcomes also make an event.

For example – The outcome of getting even numbers 2, 4, 6 form an event.

The outcome of getting odd numbers as 1, 2, 3 also form an event.

Getting a number less than 4 i.e. 1,2,3 also makes an event. etc.

Example 7 : An unbaised die is tossed. Find the probability of the following events–

(i) getting a number 4 or greater than 4.

(ii) getting an even or an odd number.

Solution : The outcomes of the experiment when the die is tossed are 1, 2, 3, 4, 5 and 6.

(i) The outcomes in which we get 4 or greater than 4 are 4, 5 and 6. i.e the number of chances for the event is 3. Therefore, the probability of the event of getting a number 4 or greater than 4 is $\frac{3}{6} = \frac{1}{2}$

(ii) Here odd numbers are 1, 3, 5 and even numbers are 2, 4 and 6.i.e both the odd and even numbers give chances for the event. Thus the number of chances for the event is 6.

Therefore, probability of the event is $\frac{6}{6} = 1$. i.e probability of getting even or odd number is 1. In other words, the event is sure to happen.

5.14 Application of chance and probability to real life

We have to depend on chance and probability in every step of life. Some examples are given below :

1. Suppose in the morning 10 o'clock you are planning to go to a place which is far from your house. There are two roads to go to the place from your house. One is short and other is long. The short road is usually very crowded from10 AM to 12 Noon. The lengthy road also gets rush sometimes but the chance of a rush along the short road is more. How will you decide your option? To reach the destination in time and to avoid the chances of getting more traffic in the short path, won't you decide to go through the lengthy path?
2. The farmers wait for a perfect weather to start harvesting i.e they wait for the possibilities of good raining. Therefore the influence of probability is seen in the agricultural work also.
3. The meterological department observing the air pressure, temperature and humidity and with knowledge of previous experience can predict about the weather condition of daily basis.

Exercise 5.3

1. A judge selects and writes some topics in pieces of papers for an extempore speech competition. If the subjects are marked as A, B, C, D then what may be the outcomes of choices by a competitor if
   (i) the competitor is allowed to select only one piece.
   (ii) the competitor is allowed to select any two pieces.
2. Find all possible outcomes when two unbiased coins are tossed.
3. In a coloured pencil box, 4 pencils are violet, 3 are blue and 5 are of red colour. If one pencil is chosen randomly from the pencils, then what are the chances for the pencil to be (i) violet (ii) blue.
4. Some events associated with the experiment of tossing of a die are given below. Express the following events with the helps of respective outcomes –
   (i) Event of getting square numbers
   (ii) Event of getting odd numbers greater than 1.
   (iii) Event of getting even numbers greater than 6.
   (iv) Event of getting prime numbers
   (v) Event of getting odd prime numbers.
   (vi) Event of getting even prime numbers.
5. In a bag, there are 15 red, 10 blue and 5 yellow marbles. If a marble is selected from the bag then what is the probability of getting a (i) red (ii) blue (iii) yellow (iv) blue or yellow marbles.

What we have learnt

- The data we collect may be in organised or unorganised form.
- In order to draw meaningful conclusions from any data, we need to organise it systematically.
- Number of times a particular sample occurs in a table is called its **Frequency**.
- Systamatically organised data can be expressed in a frequency distribution table.
- Using continuous class distribution data can be presented graphically with the help of **Histogram**.
- Data can be presented using pie-graph or circle graph also.
- There are certain experiments whose outcomes have equal chances of occurence.
- A random experiment is one whose outcomes cannot be predicted exactly in advance.
- The probabilities of outcomes of an experiment are equal if each of the outcomes has the same chance of occurrence. i.e. if the outcomes are all equally likely.
- Chances and probability are always related to real life situations.

- Probability $= \dfrac{\text{Number of outcomes favourable for an event}}{\text{Total number of outcomes of the experiment}}$

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- The person who does the work is the only one who learns.
- Mistakes are the proof that you are trying.
- Just because something is difficult, doesn't mean you shouldn't try. It just means you should try HARDER.