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Chapter-5: Data Handling

Exercise 5.1 (Page 76 of Grade 8 NCERT)

- Q1.** For which of these would you use a histogram to show the data:
- (a) The number of letters for different areas in a postman's bag.
 - (b) The height of competitors in athletics meet.
 - (c) The number of cassettes produced by 5 companies.
 - (d) The number of passengers boarding trains from 7.00 a.m. to 7.00 p.m. at a station.

Give reason for each.

Difficulty Level: Easy

What is the known/given?

4 different conditions.

What is the unknown?

The statement that will use histogram to show the data.

Reasoning:

Histogram is a graphical representation of data, if data represented in a manner of class-interval.

Solution:

Since, Histogram is a graphical representation of data, the data is represented in manner of class- interval.

In case (i), The number of areas cannot be represented in class interval. So, we cannot use the histogram to show the data.

In case (ii), Height of competitors can be divided into intervals. So, we can use histogram here.

For example,

| Height in (cm) | No. of competitors |
|----------------|--------------------|
| 150-160 | 10 |
| 160-170 | 12 |
| 170-180 | 5 |
| 180-190 | 2 |

In case (iii), Companies cannot be divided into intervals. So, we cannot use histogram here.

In case (iv), Time for boarding the train can be divided into intervals. So, we can use histogram here.

For example,

| Time in hours | No. of passengers |
|---------------|-------------------|
| 7 am – 10 am | 1500 |
| 10 am – 1 pm | 2000 |
| 1 pm – 4 pm | 1000 |
| 4 pm – 7 pm | 800 |

Q2. The shoppers who come to a departmental store are marked as: man (M), woman (W), boy (B) or girl (G). The following list gives the shoppers who came during the first hour in the morning.

W W W G B W W M G G M M W W W W G B M W B G G M W W M M W W
 W M W B W G M W W W W G W M M W W M W G W M G W M M B G G W.

Make a frequency distribution table using tally marks. Draw a bar graph to illustrate it.

Difficulty Level: Medium

What is the known/given?

List of the shoppers who came during first hour in the morning.

What is the unknown?

Frequency distribution of the shoppers list and bar graph representation.

Reasoning:

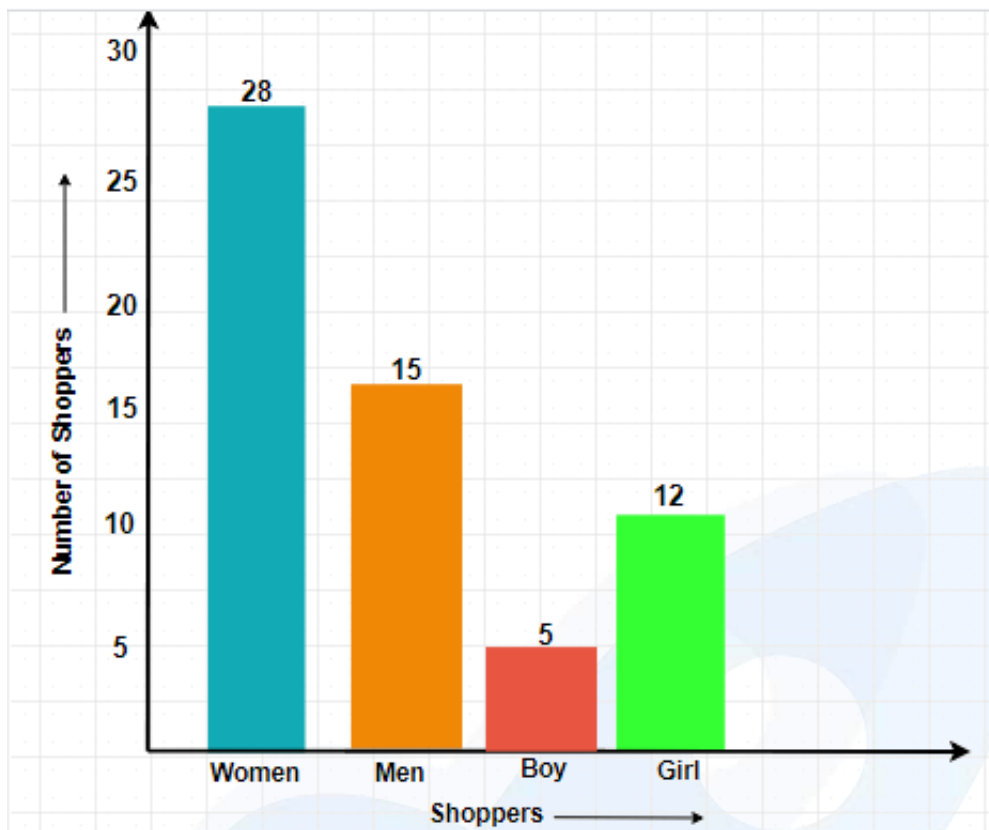
Number of occurrences of the particular entry is known as frequency.

Solution:

The frequency distribution table is as follows:

| Shopper | Tally Marks | Number of Shoppers |
|---------|-------------|--------------------|
| W | | 28 |
| M | | 15 |
| B | | 5 |
| G | | 12 |
| | Total | 60 |

The illustration of data by bar-graph is as follows:



Q3. The weekly wages (in Rs) of 30 workers in a factory are:
830, 835, 890, 810, 835, 836, 869, 845, 898, 890, 820, 860, 832, 833, 855, 845, 804,
808, 812, 840, 885, 835, 835, 836, 878, 840, 868, 890, 806, 840.

Using tally marks, make a frequency table with intervals as 800 – 810, 810 – 820 and so on.

Difficulty Level: Medium

What is the known/given?

Weekly wages of 30 workers in Rupees.

What is the unknown?

Frequency table of the weekly wages of 30 workers with intervals of 10.

Reasoning:

Number of occurrences of the particular entry is known as frequency.

Solution:

The representation of data by frequency distribution table using tally marks is as follows:

| Class Intervals | Tally Marks | Frequency |
|-----------------|--------------|-----------|
| 800–810 | /// | 3 |
| 810–820 | | 2 |
| 820–830 | | 1 |
| 830–840 | ### | 9 |
| 840–850 | ### | 5 |
| 850–860 | | 1 |
| 860–870 | | 3 |
| 870–880 | | 1 |
| 880–890 | | 1 |
| 890–900 | | 4 |
| | Total | 30 |

Q4. Draw a histogram for the frequency table made for the data in Question 3 and answer the following questions.

- (i) How many workers earn Rs 850 and more?
- (ii) How many workers earn less than Rs 850?

Difficulty Level: Medium

What is the known/given?

Weekly wages of 30 workers in Rupees.

What is the unknown?

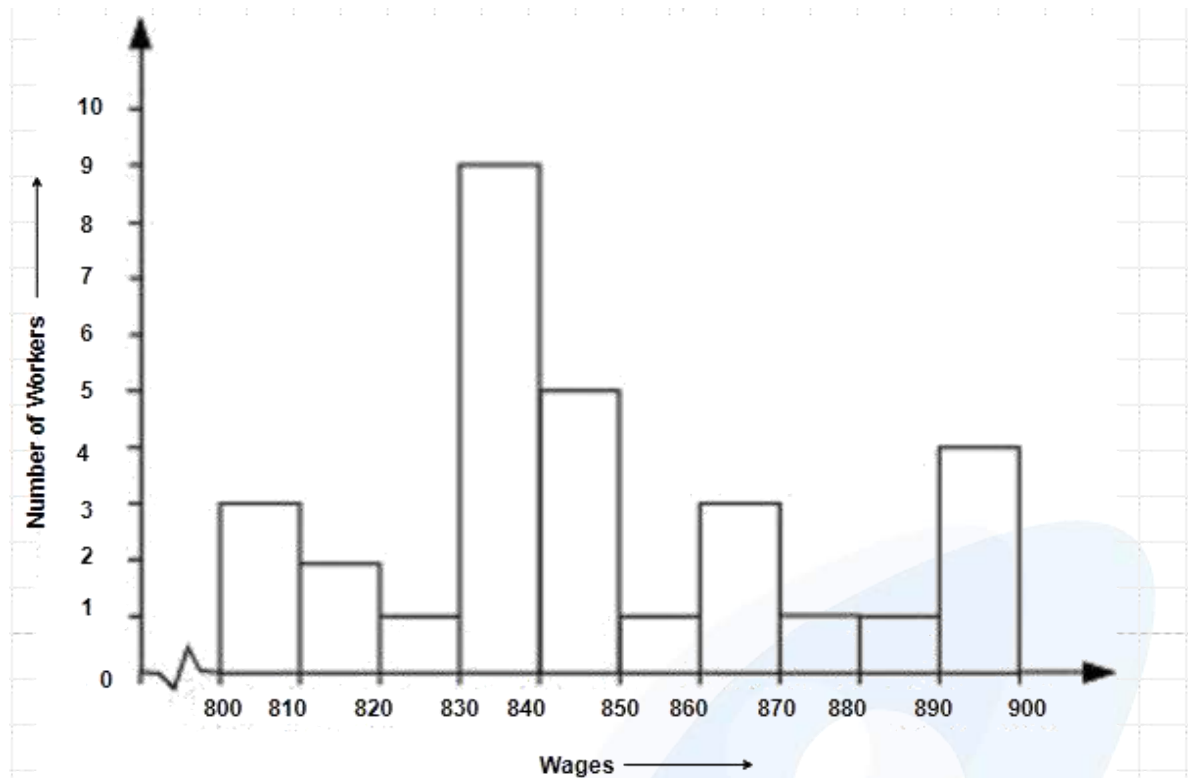
1. Number of workers earning 850 or more.
2. Number of workers earning less than 850.

Reasoning:

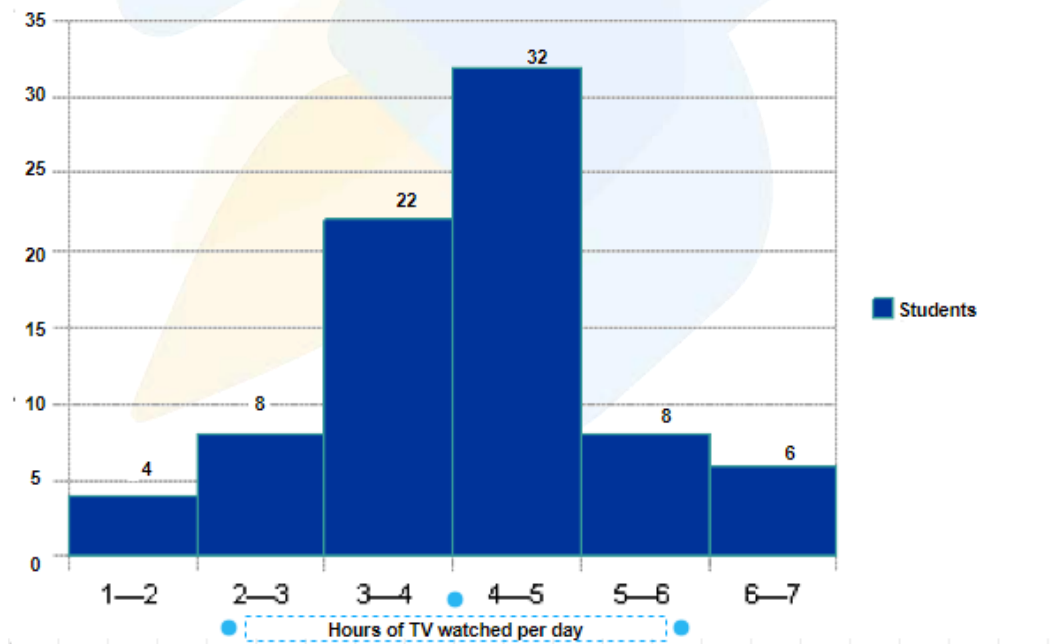
Number of occurrences of the particular entry is known as frequency.

Solution:

- (i) 830 – 840 group has the maximum number of workers.
- (ii) 10 workers can earn more than Rs 850.
- (iii) 20 workers earn less than Rs 850.



Q5. The number of hours for which students of a particular class watched television during holidays is shown through the given graph. We draw the histogram for above frequency table:



Answer the following:

- (i) For how many hours did the maximum number of students watch T.V.?
- (ii) How many students watched TV for less than 4 hours?
- (iii) How many students spent more than 5 hours in watching TV?

Difficulty Level: Medium

What is the known/given?

Histogram representing the number of students versus hours of TV watched per day.

What is the unknown?

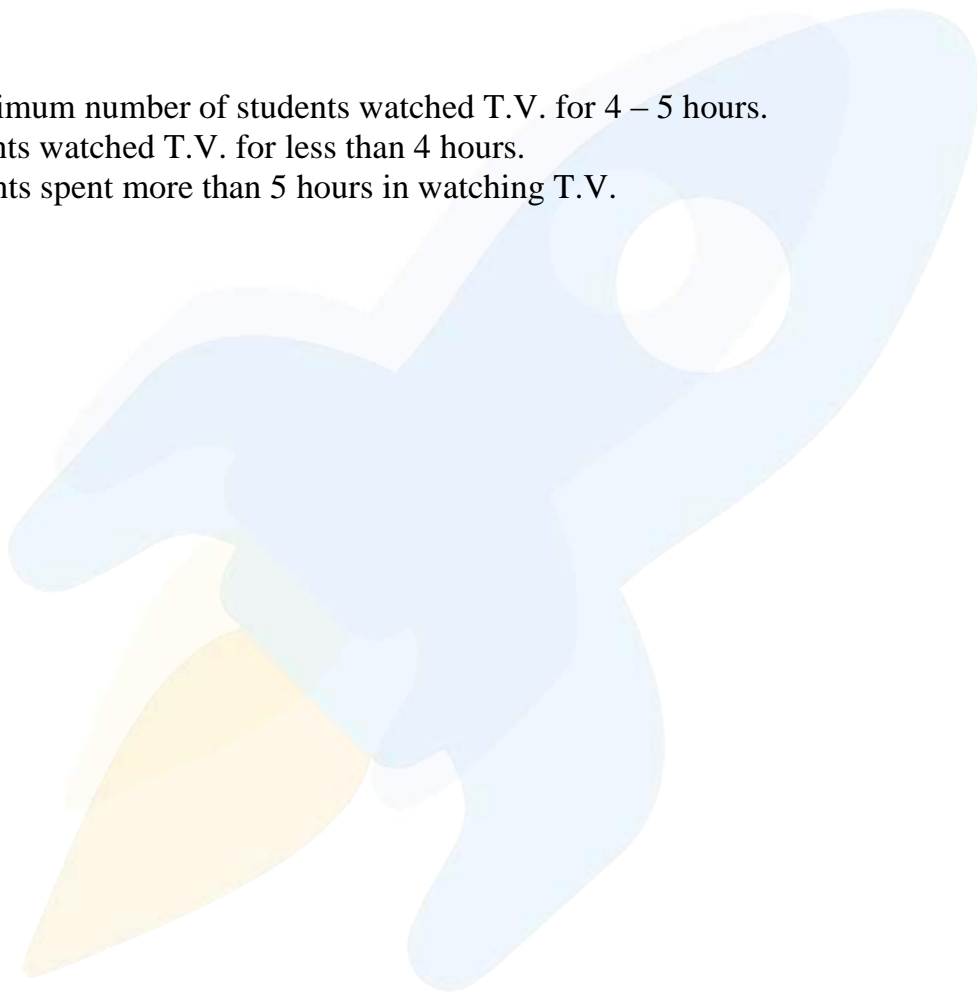
- (i) Number of hours did the maximum number of students watch T.V.
- (ii) Number of students watched TV for less than 4 hours.
- (iii) Number of students spent more than 5 hours in watching TV.

Reasoning:

Histogram is a graphical representation of data, the data represented in manner of class-interval.

Solution:

- (i) The maximum number of students watched T.V. for 4 – 5 hours.
- (ii) 34 students watched T.V. for less than 4 hours.
- (iii) 14 students spent more than 5 hours in watching T.V.



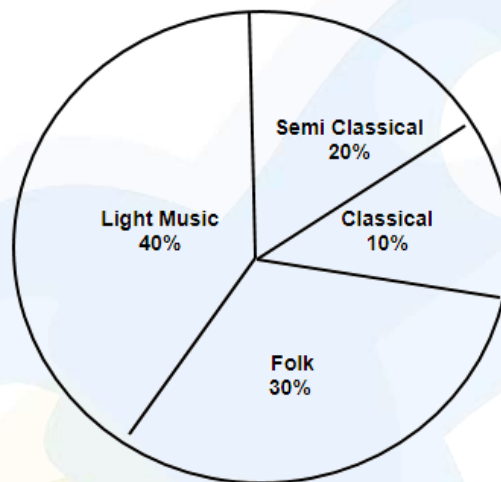
Chapter-5: Data Handling

Exercise 5.2 (Page 82 of Grade 8 NCERT)

Q1. A survey was made to find the type of music that a certain group of young people liked in a city. Adjoining pie chart shows the findings of this survey.

From this pie chart, answer the following:

- If 20 people liked classical music, how many young people were surveyed?
- Which type of music is liked by the maximum number of people?
- If a cassette company were to make 1000 CD's, how many of each type would they make?



Difficulty Level: Medium

What is the known/given?

Pie chart showing the distribution of music.

What is the unknown?

- The number of young people were surveyed if 20 people liked classical music.
- The type of music is liked by the maximum number of people.
- Each type of cassettes would they make, if a cassette company were to make 1000 CD's.

Reasoning:

A circle graph or pie chart shows the relationship between a whole and its parts.

Solution:

- 10% represents 20 people.

$$\text{Therefore } 100\% \text{ represents } = \frac{100 \times 20}{10} = 200 \text{ People}$$

Hence, 200 young people were surveyed.

- (ii) From the pie chart, it can be easily observed that the light music is represented by the maximum part of the pie chart (i.e. 40%).

Hence, Light music is liked by the maximum number of people.

(iii) Number of CD's of classical music = $\frac{10 \times 1000}{100} = 100$




Number of CD's of semi-classical music = $\frac{20 \times 1000}{100} = 200$

Number of CD's of light music = $\frac{40 \times 1000}{100} = 400$

Number of CD's of folk music = $\frac{30 \times 1000}{100} = 300$

Q2. A group of 360 people were asked to vote for their favourite season from the three seasons rainy, winter and summer.

- Which season got the most votes?
- Find the central angle of each sector.
- Draw a pie chart to show this information.

| Season | No. of votes |
|--|--------------|
| Summer  | 90 |
| Rainy  | 120 |
| Winter  | 150 |

Difficulty Level: Medium

What is the known/given?

Voting distribution of 360 people for their favorite season.

What is the unknown?

- The season got the most votes.
- The central angle of each sector.
- Pie chart that depicts this information.

Reasoning:

A circle graph or pie chart shows the relationship between a whole and its parts.

Solution:

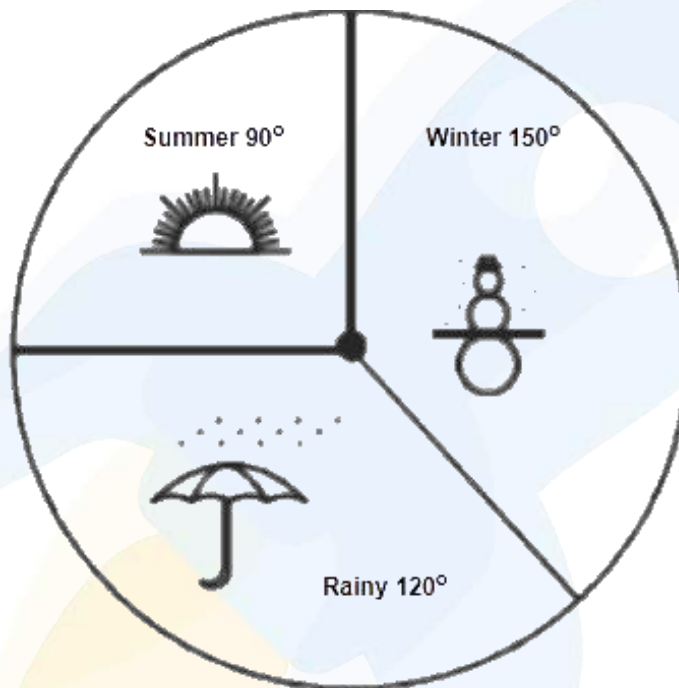
(i) By observing the given data, Winter season got the most votes.

(ii) Central angle of summer = $\frac{90^\circ \times 360^\circ}{360^\circ} = 90^\circ$

Central angle of rainy season = $\frac{120^\circ \times 360^\circ}{360^\circ} = 120^\circ$

Central angle of winter season = $\frac{150^\circ \times 360^\circ}{360^\circ} = 150^\circ$

(iii)



Q3. Draw a pie chart showing the following information. The table shows the colours preferred by a group of people.

| Colours | No. of People |
|--------------|---------------|
| Blue | 18 |
| Green | 9 |
| Red | 6 |
| Yellow | 3 |
| Total | 36 |

Difficulty Level: Medium

What is the known/given?

Distribution of the colours preferred by a group of people.

What is the unknown?

Pie chart of the given information.

Reasoning:

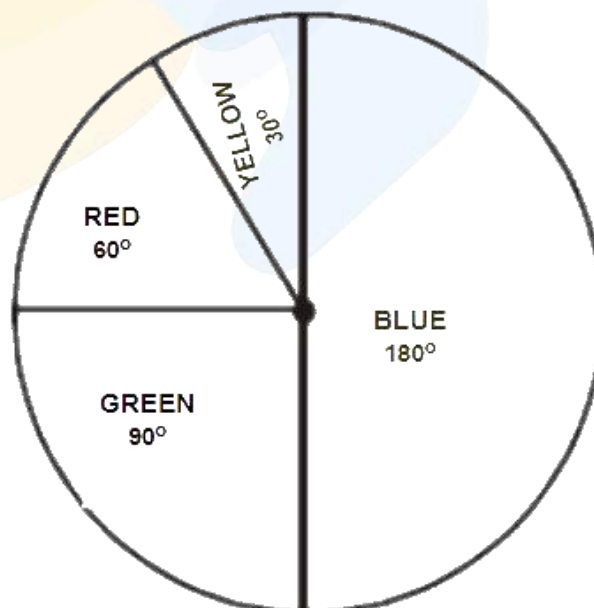
A circle graph or pie chart shows the relationship between a whole and its parts.

Solution:

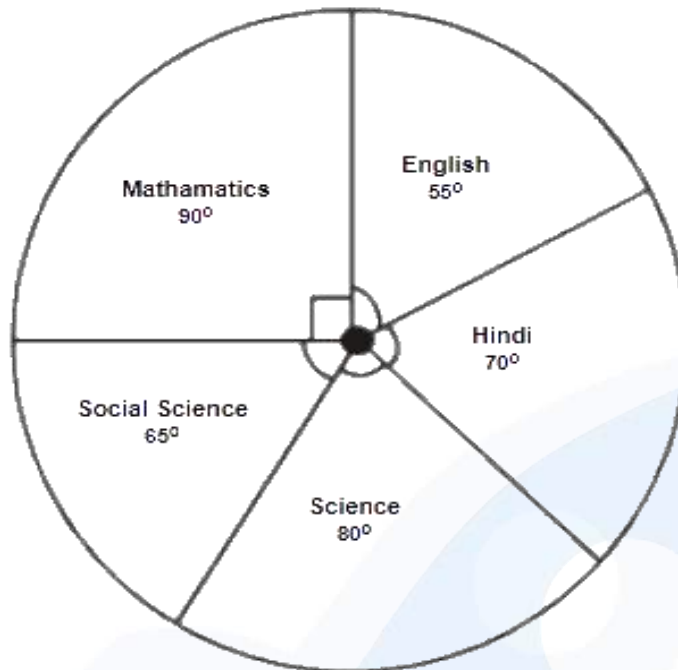
Here, Total angle = 360° and total number of people = 36

The central angle for each colours can be calculated as below:

| Colours | No. of People | In Fraction | Central Angles |
|---------|---------------|-------------------------------|--|
| Blue | 18 | $\frac{18}{36} = \frac{1}{2}$ | $\frac{1}{2} \times 360^\circ = 180^\circ$ |
| Green | 9 | $\frac{9}{36} = \frac{1}{4}$ | $\frac{1}{4} \times 360^\circ = 90^\circ$ |
| Red | 6 | $\frac{6}{36} = \frac{1}{6}$ | $\frac{1}{6} \times 360^\circ = 60^\circ$ |
| Yellow | 3 | $\frac{3}{36} = \frac{1}{12}$ | $\frac{1}{12} \times 360^\circ = 30^\circ$ |



Q4. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following questions:



- In which subject did the student score 105 marks?
(Hint: for 540 marks, the central angle = 360° and so, for 105 marks, what is the central angle?)
- How many more marks were obtained by the student in Mathematics than in Hindi?
- Examine whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.
(Hint: Just study the central angles)

Difficulty Level: Hard

What is the known/given?

- Pie chart describing the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science.
- Total marks obtained by the students are 540

What is the unknown?

- The subject in which the student scored 105 marks.
- Number of more marks scored by the student in Mathematics than in Hindi.
- Whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.

Reasoning:

A circle graph or pie chart shows the relationship between a whole and its parts. Sum of the total angles in a pie chart is equal to 360.

Solution:

| Subject | Central Angle | Marks obtained |
|----------------|---------------|--|
| Mathematics | 90° | $\frac{90^\circ}{360^\circ} \times 540 = 135$ |
| Social Science | 65° | $\frac{65^\circ}{360^\circ} \times 540 = 97.5$ |
| Science | 80° | $\frac{80^\circ}{360^\circ} \times 540 = 120$ |
| Hindi | 70° | $\frac{70^\circ}{360^\circ} \times 540 = 105$ |
| English | 55° | $\frac{55^\circ}{360^\circ} \times 540 = 82.5$ |

- (i) The student scored 105 marks in Hindi.
- (ii) Marks obtained in Mathematics = 135
 Marks obtained in Hindi = 105
 Difference = $135 - 105 = 30$
 Thus, 30 more marks were obtained by the student in Mathematics than in Hindi.
- (iii) The sum of marks in Social Science and Mathematics = $97.5 + 135 = 232.5$
 The sum of marks in Science and Hindi = $120 + 105 = 225$
 Yes, the sum of the marks in Social Science and Mathematics is more than that in Science and Hindi.

Q5. The number of students in a hostel, speaking different languages is given below. Display the data in a pie chart.

| Language | Hindi | English | Marathi | Tamil | Bengali | Total |
|-----------------|-------|---------|---------|-------|---------|-------|
| No. of students | 40 | 12 | 9 | 7 | 4 | 72 |

Difficulty Level: Medium

What is the known/given?

Distribution of the students with respect to the language they speak.

What is the unknown?

Pie chart of the given information.

Reasoning:

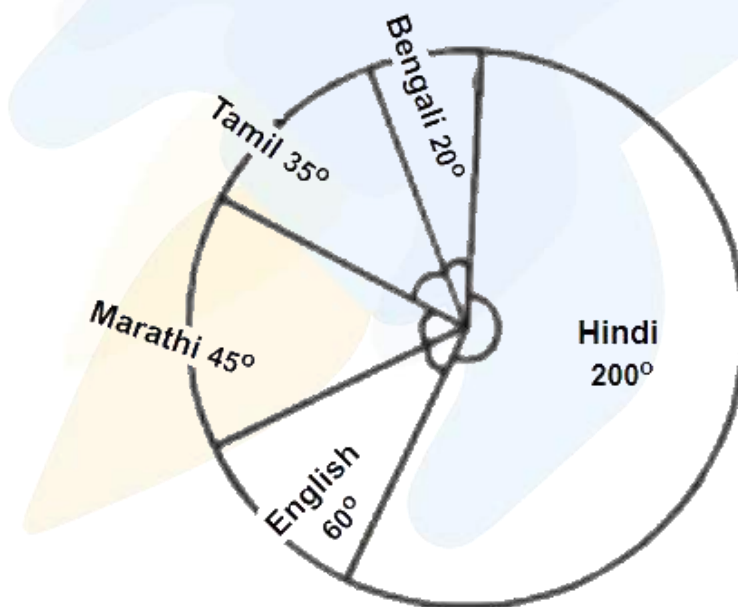
A circle graph or pie chart shows the relationship between a whole and its parts. Sum of the total angles in a pie chart is equal to 360° .

Solution:

The central angle for each language is calculated as below,

| Language | No. of students | In fraction | Central Angle |
|--------------|-----------------|-------------------------------|--|
| Hindi | 40 | $\frac{40}{72} = \frac{5}{9}$ | $\frac{5}{9} \times 360^\circ = 200^\circ$ |
| English | 12 | $\frac{12}{72} = \frac{1}{6}$ | $\frac{1}{6} \times 360^\circ = 60^\circ$ |
| Marathi | 9 | $\frac{9}{72} = \frac{1}{8}$ | $\frac{1}{8} \times 360^\circ = 45^\circ$ |
| Tamil | 7 | $\frac{7}{72} = \frac{7}{72}$ | $\frac{7}{72} \times 360^\circ = 35^\circ$ |
| Bengali | 4 | $\frac{4}{72} = \frac{1}{18}$ | $\frac{1}{18} \times 360^\circ = 20^\circ$ |
| Total | 72 | | |

Pie chart for above data is drawn as below:



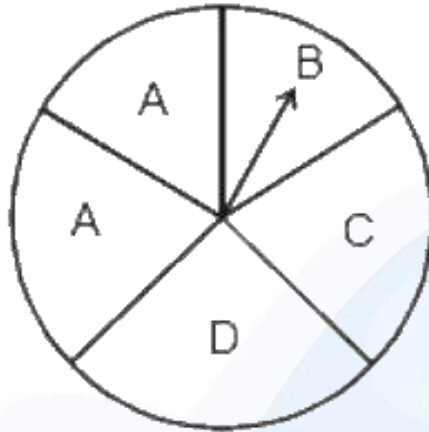
Chapter-5: Data Handling

Exercise 5.3 (Page 87 of Grade 8 NCERT)

Q1. List the outcomes you can see in these experiments.

(a) Spinning a wheel

(b) Tossing two coins together



Difficulty Level: Easy

What is the known/given?

Two different condition.

What is the unknown?

Outcomes of the given conditions.

Reasoning:

All the possibilities of an event are known as its outcomes.

Solution:

(a) There are four letters A, B, C and D in a spinning wheel. So, there are 4 outcomes.

(b) When two coins are tossed together, there are four possible outcomes HH, HT, TH, TT.

(Here HT means head on first coin and tail on second coin and so on.)

Q2. When a die is thrown, list the outcomes of an event of getting:

(i) (a) a prime number

(b) not a prime number

(ii) (a) a number greater than 5

(b) a number not greater than 5

Difficulty Level: Easy

What is the known/given?

A situation in which a die is thrown.

When a dice is thrown, the possible outcomes are 1,2,3,4,5 and 6.

What is the unknown?

Outcomes of the situation under given conditions.

Reasoning:

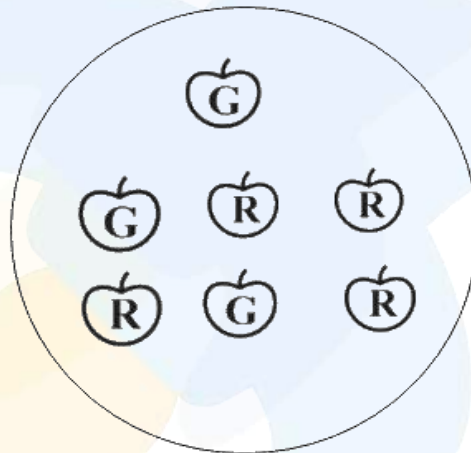
All the possibilities of an event are known as its outcomes.

Solution:

- i) (a) Outcomes of event of getting a prime number are 2, 3 and 5.
(b) Outcomes of event of not getting a prime number are 1, 4 and 6.
- ii) (a) Outcomes of event of getting a number greater than 5 is 6.
(b) Outcomes of event of not getting a number greater than 5 are 1, 2, 3, 4 and 5.

Q3. Find the:

- (a) Probability of the pointer stopping on D in (Question 1 (a))?
- (b) Probability of getting an ace from a well shuffled deck of 52 playing cards?
- (c) Probability of getting a red apple? (See figure alongside)



Difficulty Level: Medium

What is the known/given?

- (i) Spinning wheel image
- (ii) Deck of 52 playing cards
- (iii) Image depicting Red and Green apples

What is the unknown?

- (i) Probability of the pointer stopping on D.
- (ii) Probability of getting an ace from a well shuffled deck of 52 playing cards.
- (iii) Probability of getting a red apple

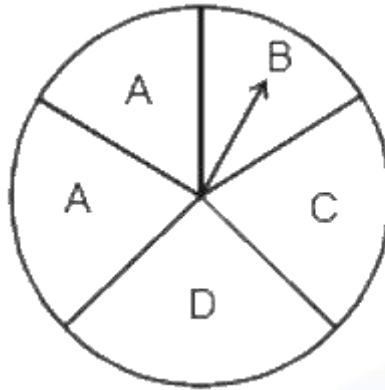
Reasoning:

$$\text{probability} = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Solution:

(a) In a spinning wheel, there are five pointers A, A, B, C, D. So, there are five outcomes. Pointer stops at D which is 1 outcome.

So, the probability of the pointer stopping on D = $\frac{1}{5}$

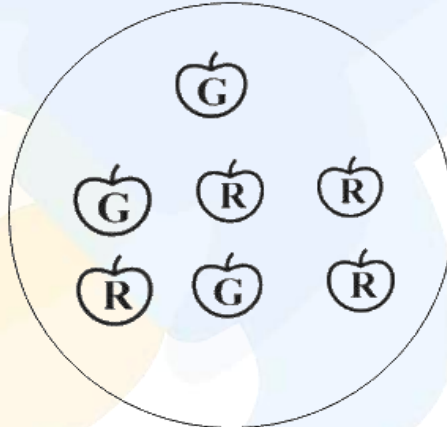


(b) There are 4 aces in a deck of 52 playing cards. So, there are 4 events of getting an ace.

So, probability of getting an ace = $\frac{4}{52} = \frac{1}{13}$

(c) Total number of apples = 7
Number of red apples = 4

So, probability of getting red apple = $\frac{4}{7}$



Q4. Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it.

What is the probability of:

- i) getting a number 6?
- ii) getting a number less than 6?
- iii) getting a number greater than 6?
- iv) getting a 1-digit number?

Difficulty Level: Medium

What is the known/given?

Numbers 1 to 10 are written on ten separate slips (one number on one slip), kept in a box and mixed well.

What is the unknown?

- i) probability of getting a number 6.
- ii) probability of getting a number less than 6.
- iii) probability of getting a number greater than 6.
- iv) probability of getting a 1-digit number.

Reasoning:

$$\text{probability} = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Solution:

- (i) Outcome of getting a number 6 from ten separate slips is 1.

Therefore, probability of getting a number 6 = $\frac{1}{10}$

- (ii) Numbers less than 6 are 1, 2, 3, 4 and 5. So, there are 5 possible outcomes.

Therefore, probability of getting a number less than 6 = $\frac{5}{10} = \frac{1}{2}$

- (iii) Number greater than 6 are 7, 8, 9, 10. So there are 4 possible outcomes.

Therefore, probability of getting a number greater than 6 = $\frac{4}{10} = \frac{2}{5}$

- (iv) One-digit numbers are 1, 2, 3, 4, 5, 6, 7, 8, 9 out of ten.

Therefore, probability of getting a 1-digit number = $\frac{9}{10}$

Q5. If you have a spinning wheel with 3 green sectors, 1 blue sector and 1 red sector, what is the probability of getting a green sector? What is the probability of getting a non-blue sector?

Difficulty Level: Medium**What is the known/given?**

Spinning wheel with 3 green sectors, 1 blue sector and 1 red sector.

What is the unknown?

- i) probability of getting a green sector
- ii) probability of getting a non-blue sector

Reasoning:

$$\text{probability} = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Solution:

Total number of sectors = 5

Total number of green sectors = 3

Therefore, probability of getting a green sector = $\frac{3}{5}$

Total number of blue sectors = 1

Total number of non-blue sectors = $5 - 1 = 4$

Therefore, probability of getting a non-blue sector = $\frac{4}{5}$

Q6. Find the probability of the events given in Question 2.

Difficulty Level: Hard

What is the known/given?

A situation in which a die is thrown.

What is the unknown?

Probability of the events

Reasoning:

$$\text{probability} = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Solution:

When a die is thrown, there are total six outcomes, i.e., 1, 2, 3, 4, 5 and 6.

(i) (a) 2, 3, 5 are prime numbers. So, there are 3 outcomes out of 6.

$$\text{Therefore, probability of getting a prime number} = \frac{3}{6} = \frac{1}{2}$$

(b) 1, 4, 6 are not the prime numbers. So, there are 3 outcomes out of 6.

$$\text{Therefore, probability of getting a prime number} = \frac{3}{6} = \frac{1}{2}$$

(ii) (a) Only 6 is greater than 5. So, there is 1 outcome out of 6.

$$\text{Therefore, probability of getting a number greater than 5} = \frac{1}{6}$$

(b) Numbers not greater than 5 are 1, 2, 3, 4 and 5. So there are 5 outcomes out of 6.

$$\text{Therefore, probability of not getting a number greater than 5} = \frac{1}{6}$$

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