Exercise 5.1   Page: 76

1. 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 an athletics meet.
        (c) The number 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.
Solution:

We know that Histogram is a graphical representation of data if the data represented using class- interval.
Since the cases mentioned in options (b) and (d) can be divided into class intervals, histogram can be used to show the data.
Similarly, since the cases mentioned in options (a) and (c) cannot be divided into class intervals, histogram cannot be used to represent the data.

2. 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 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.
Solution:

Frequency distribution table:

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

Bar-graph:

3. The weekly wages (in ₹) 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.

Solution:

The frequency table with intervals as 800 – 810, 810 – 820 and so on, using tally marks is given below:

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

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

        (i) Which group has the maximum number of workers?

        (ii) How many workers earn ₹ 850 and more?

        (iii) How many workers earn less than ₹ 850?

Solution:
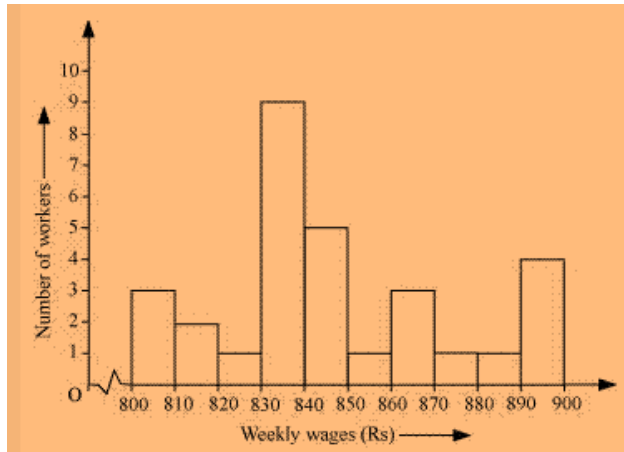
(i) 830-840 is the group having maximum number of workers, 9, compared to other groups.
(ii) Workers earning ₹ 850 and more= 1+3+1+1+4=10
(iii) Workers earning ₹ 850 and more= 3+2+1+9+5=20

5. The number of hours for which students of a particular class watched television during holidays is shown through the given graph.
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?
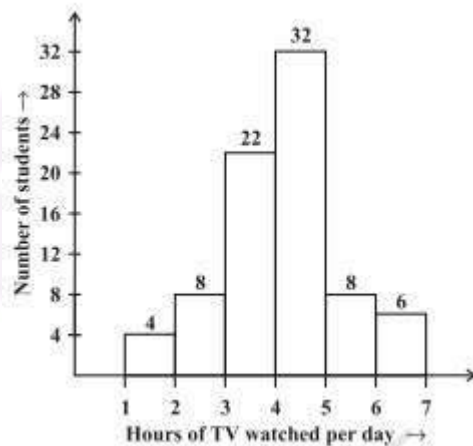
Solution:

(i) 32 students watched T.V for 4-5 hours. ∴, The maximum number of students who watched T.V. for 4 – 5 hours.
(ii) The number of students who watched T.V. less than 4 hours= 22+8+4=34
(iii) The number of students who spent more than 5 hours in watching TV
=8+6=14

Exercise 5.2   Page: 82

1. 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:

(i) If 20 people liked classical music, how many young people were surveyed?

(ii) Which type of music is liked by the maximum number of people?

(iii) If a cassette company were to make 1000 CD's, how many of each type would they make?
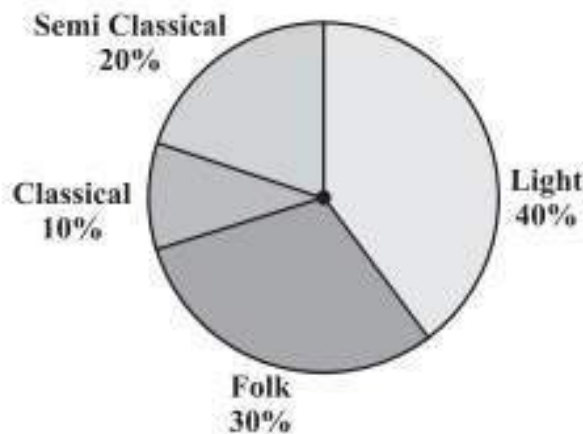
Solution:

(i) 10% represents 100 people.

$\Rightarrow$ 20% represents $= (100 \times 20)/10 = 200$

$\therefore$, 200 people were surveyed.

(ii) Since 40% of the total people surveyed liked light music and no other form of song liked more than that, we can conclude that Light music is liked by the maximum number of people.

(iii) CD's of classical music $= (10 \times 1000)/100 = 100$

CD's of semi-classical music $= (20 \times 1000)/100 = 200$

CD's of light music $= (40 \times 1000)/100 = 400$

CD's of folk music $= (30 \times 1000)/100 = 300$

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

(i) Which season got the most votes?

(ii) Find the central angle of each sector.

(iii) Draw a pie chart to show this information

Season		No. of votes
Summer		90
Rainy		120
Winter		150

Solution:

(i) According to the table given in the question, Winter season got the most votes.

(ii) Central angle of summer season= (90×360)/360=90º
Central angle of rainy season= (120×360)/360=120º
Central angle of winter season= (150×360)/360=150º

(iii)

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

Colours	Number of people
Blue	18
Green	9
Red	6
Yellow	3
Total	36

Solution:

Here, central angle = 360º

Total number of people = 36

Colours	No. of people	In fraction	Central angles
Blue	18	$\dfrac{18}{36} = \dfrac{1}{2}$	$\dfrac{1}{2} \times 360° = 180°$
Green	9	$\dfrac{9}{36} = \dfrac{1}{4}$	$\dfrac{1}{4} \times 360° = 90°$
Red	6	$\dfrac{6}{36} = \dfrac{1}{6}$	$\dfrac{1}{6} \times 360° = 60°$
Yellow	3	$\dfrac{3}{36} = \dfrac{1}{12}$	$\dfrac{1}{12} \times 360° = 30°$
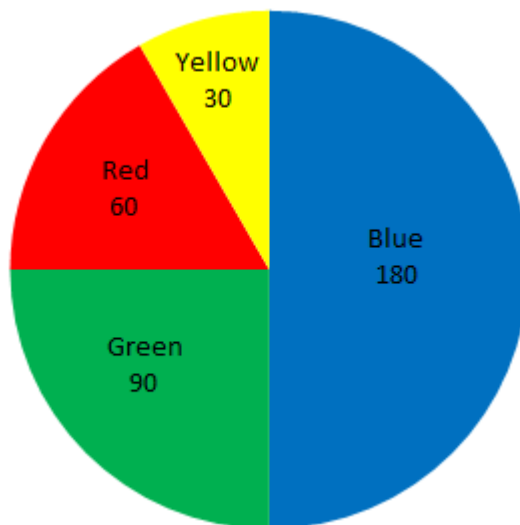
4. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following questions.

(i) In which subject did the student score 105 marks?

(Hint: for 540 marks, the central angle = 360°. So, for 105 marks, what is the central angle?)

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?

(iii) 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).
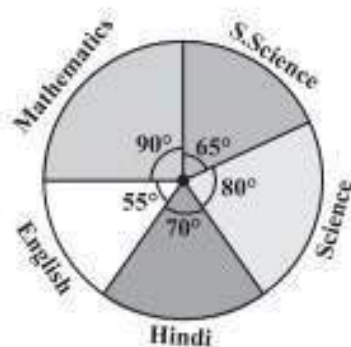
Solution:

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

(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
∴, the sum of the marks in Social Science and Mathematics is more than that in Science and Hindi.

**5. 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
Number of students	40	12	9	7	4	72

Solution:

Language	No. of students	In fraction	Central Angle
Hindi	40	$\dfrac{40}{72} = \dfrac{5}{9}$	$\dfrac{5}{9} \times 360° = 200°$
English	12	$\dfrac{12}{72} = \dfrac{1}{6}$	$\dfrac{1}{6} \times 360° = 60°$
Marathi	9	$\dfrac{9}{72} = \dfrac{1}{8}$	$\dfrac{1}{8} \times 360° = 45°$
Tamil	7	$\dfrac{7}{72} = \dfrac{7}{72}$	$\dfrac{7}{72} \times 360° = 35°$
Bengali	4	$\dfrac{4}{72} = \dfrac{1}{18}$	$\dfrac{1}{18} \times 360° = 20°$
Total	72		
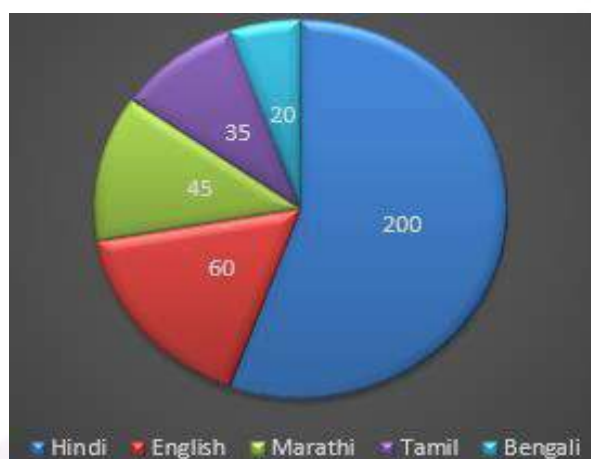
Exercise 5.3   Page: 87

1. List the outcomes you can see in these experiments.
(a) Spinning a wheel (b) Tossing two coins together

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.

2. 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.
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.
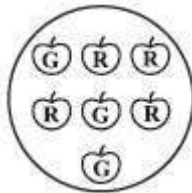(ii) (a) Outcomes of event of getting a number greater than 5 is 6.

   (b) Outcomes of event of not getting a number greater than 5 are 1, 2, 3, 4 and 5.

3. 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 below)

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 one outcome.
So the probability of the pointer stopping on D = 1/5
(b) There are 4 aces in a deck of 52 playing cards. So there are four events of getting an ace.
So, probability of getting an ace = 4/52 = 1/13
(c) Total number of apples = 7

Number of red apples = 4

Probability of getting red apple = 4/7

4. 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?
Solution:

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

∴, probability of getting a number 6 = 1/10

(ii) Numbers less than 6 are 1, 2, 3, 4 and 5 which are five. So there are 5 outcomes.
∴, probability of getting a number less 6 =5/10 = ½

(iii)Number greater than 6 out of ten that are 7, 8, 9, 10. So there are 4 possible outcomes.
∴, probability of getting a number greater than 6 = 4/10 = 2/5

(iv) One digit numbers are 1, 2, 3, 4, 5, 6, 7, 8, 9 out of ten.
∴, probability of getting a 1-digit number = 9/10

5. 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?
Solution:

A total of five sectors are present.
Out of the five sectors, three sectors are green.
∴, probability of getting a green sector = 3/5

Out of the five sectors, one sector is blue.
Hence, Non-blue sectors = 5 – 1 = 4 sectors
∴, probability of getting a non-blue sector= 4/5

6. Find the probabilities of the events given in Question 2.

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 the prime numbers. So there are 3 outcomes out of 6.

∴,probability of getting a prime number =3/6 = ½

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

∴,probability of getting a prime number =3/6 = ½

(ii)

(c) Only 6 is greater than 5. So there is one outcome out of 6.

∴,probability of getting a number greater than 5= 1/6

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

∴,probability of not getting a number greater than 5= 5/6