CHAPTER-4

Data Handling

2Mark Q&A:

Exercise 4.1

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 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 a reason for each.

Solution:

We know that a Histogram is a graphical representation of data if the data is represented using class interval.

Since the cases mentioned in options (b) and (d) can be divided into class intervals, the histogram can be used to show the data.

Similarly, since the cases mentioned in options (a) and (c) cannot be divided into class intervals, histograms 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 of 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:

Shopper	Tally Marks	Number of shoppers
W	𝍸 𝍸 𝍸 𝍸 𝍸 III	28
M	𝍸 𝍸 𝍸	15
B	𝍸	5
G	𝍸 𝍸 II	12
	Total	60

Frequency distribution table:

Bar-graph:


30
25
20
15
10
5
O
Number of Shoppers
Woman
Man
Boy
Girl
Shoppers

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:

Class Intervals	Tally Marks	Frequency
800–810	III	3
810–820	II	2
820–830	I	1
830–840	𝍸 III	9
840–850	𝍸	5
850–860	I	1
860–870	III	3
870–880	I	1
880–890	I	1
890–900	IIII	4
	Total	30

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

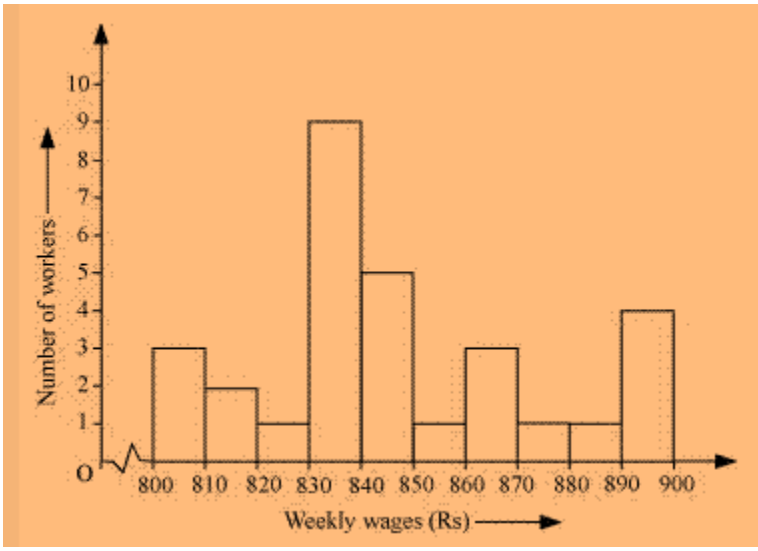
4. Draw a histogram for the frequency table made for the data in Question 3 and answer the following questions.

(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 a maximum number of workers, 9, compared to other groups.

(ii) Workers earning ₹ 850 and more= 1+3+1+1+4=10

(iii) Workers earning less than ₹ 850= 3+2+1+9+5=20

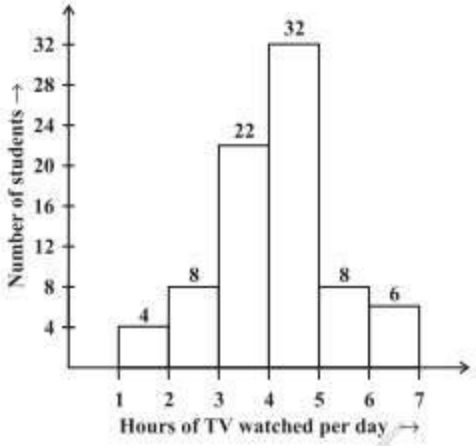
5. The number of hours for which students of a particular class watched television during holidays is shown in the given graph.

Answer the following:

(i) For how many hours did the maximum number of students watch TV?

(ii) How many students watched TV for less than 4 hours?

(iii) How many students spent more than 5 hours watching TV?



Solution:

(i) 32 students watched TV for 4-5 hours. ∴ The maximum number of students who watched TV for 4 – 5 hours.

(ii) The number of students who watched TV less than 4 hours= 22+8+4=34

(iii) The number of students who spent more than 5 hours watching TV

=8+6=14.

Exercise 4.2

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, and 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 the event of getting a prime number are 2, 3 and 5.

(b) Outcomes of the event of not getting a prime number are 1, 4 and 6.

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

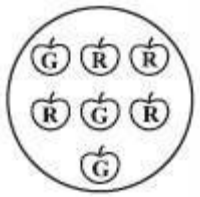
(b) Outcomes of the event of not getting a number greater than 5 are 1, 2, 3, 4 and 5.

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. The 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 for getting an ace.

So, the probability of getting an ace = 4/52 = 1/13

(c) Total number of apples = 7

Number of red apples = 4

Probability of getting a 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 is a total of 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

5Mark Q&A:

Exercise 4.3

1. A survey was made to find the type of music that a certain group of young people liked in a city.

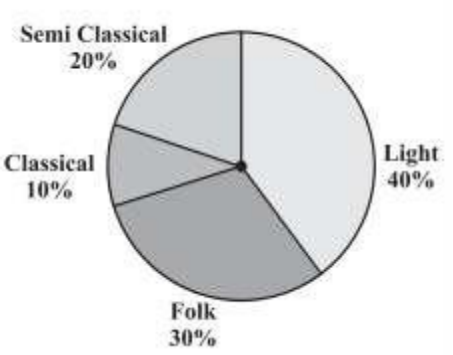
An adjoining pie chart shows the findings of this survey. From this pie chart, answer the following:

(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 CDs, how many of each type would they

make?



Solution:

(i) 10% represents 100 people.

$\Longrightarrow$20% represents = (100×20)/10 = 200

$\therefore$ 200 people were surveyed.

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

(iii) CDs of classical music = (10 × 1000)/100 = 100

CDs of semi-classical music = (20 × 1000)/100 = 200

CDs of light music = (40 × 1000)/100 = 400

CDs of folk music = (30 × 1000)/100 = 300

2. A group of 360 people were asked to vote for their favourite 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, the 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)

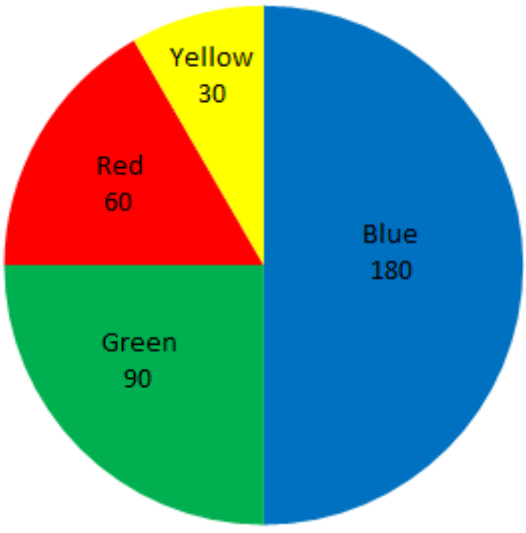
3. Draw a pie chart showing the following information. The table shows the colours preferred by a group of people.

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	$\frac{18}{36}=\frac{1}{2}$	$\frac{1}{2}\times 360^\circ = 180^\circ$
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	$\frac{3}{36}=\frac{1}{12}$	$\frac{1}{12}\times 360^\circ = 30^\circ$



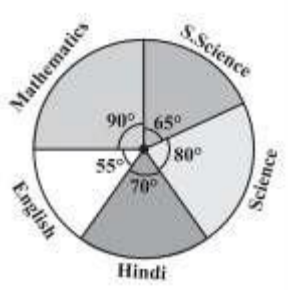
4. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following questions.

(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°	$\frac{90^\circ}{360^\circ}\times 540 = 135$
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

∴ the sum of the marks in Social Science and Mathematics is more than 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	$\frac{40}{72}=\frac{5}{9}$	$\frac{5}{9}\times 360^\circ = 200^\circ$
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		

1Mark Q&A:

Exercise 4.4

Multiple-choice questions and answers

1. What is the primary purpose of data handling in mathematics?

A) To make data look neat and organized

B) To represent data in visual forms like graphs and charts

C) To increase the amount of data collected

D) To find the average of a set of numbers

Answer: B) to represent data in visual forms like graphs and charts

2. In a frequency distribution table, what does the "frequency" represent?

A) The range of data

B) The number of times a particular data point occurs

C) The mean of the data

D) The highest data value

Answer: B) The number of times a particular data point occurs

3. Which of the following is not a measure of central tendency?

A) Mean

B) Median

C) Mode

D) Range

Answer: D) Range

4. If you have a data set with the numbers 5, 7, 9, 12, and 15, what is the median?

A) 7

B) 9

C) 12

D) 15

Answer: B) 9

5. What is the mode of the following data set: 7, 9, 5, 7, 3, 7, 8, 5?

A) 7

B) 5

C) 3

D) 9

Answer: A) 7

6. Which type of graph is used to display the frequency of categorical data?

A) Histogram

B) Bar graph

C) Line graph

D) Scatter plot

Answer: B) Bar graph

7. The range of a data set is calculated by:

A) Adding all the values in the data set

B) Finding the middle value of the data set

C) Subtracting the smallest value from the largest value

D) Finding the average of the data set

Answer: C) Subtracting the smallest value from the largest value

8. What is the formula for calculating the mean of a set of numbers?

A) Sum of all values / Number of values

B) Sum of the largest and smallest values

C) Sum of the odd values

D) Sum of the even values

Answer: A) Sum of all values / Number of values

9. Which of the following measures of central tendency is not affected by extreme values (outliers)?

A) Mean

B) Median

C) Mode

D) Range

Answer: B) Median

10. In a cumulative frequency distribution, what does the cumulative frequency represent?

A) The total number of data points

B) The number of data points up to a certain value

C) The average of the data set

D) The highest data point

Answer: B) The number of data points up to a certain value.

Exercise 4.5

Fill in the blanks:

a) Data handling involves collecting, organizing, _____, and interpreting data.

b) A _____is a graphical representation of data using bars of different lengths or heights.

c) The most frequent value in a data set is called the_____.

d) A_____ is a numerical value that describes a characteristic of a population or sample.

e) The _____ is the middle value in a data set when arranged in ascending order.

f) The _____ is a measure of the average value of a set of numbers.

g)_____ is a representation of data in which a circle is divided into sectors to represent the relative sizes of data.

h) The _____ is the difference between the largest and smallest values in a data set.

i)_____ is the process of drawing conclusions or making predictions from data.

Answers:

a) representing

b) bar graph

c) mode

d) statistic

e) median

f) mean

g) Pie chart

h) range

i) Inference

Summary

1. Data Collection:

- Data handling involves collecting information or observations about a particular topic or situation. This data can be collected through surveys, experiments, or observations.

2. Organizing Data:

- Once data is collected, it needs to be organized for easy analysis. This includes arranging data in tables, tally charts, or frequency tables.

3. Types of Data Representation:

- **Bar Graphs:** Used to represent categorical data where bars of different lengths or heights represent the frequency or quantity of each category.

- **Pie Charts:** Display data in a circular graph where sectors represent portions of a whole or percentages.

4. Measures of Central Tendency:

- **Mean:** Calculated by finding the sum of all values and dividing by the total number of values. It represents the average value of a data set.

- **Median:** The middle value when data is arranged in ascending or descending order. It's the value that separates the higher half from the lower half.

- **Mode**: The value that appears most frequently in a data set.

5. Measures of Spread:

- **Range:** It's the difference between the largest and smallest values in a data set. It shows the spread or variability of the data.

6. Data Interpretation and Inference:

- Analyzing data involves drawing conclusions and making predictions based on the information obtained. Making inferences involves using data to make educated guesses or predictions about a larger group based on the collected sample data.

7. Statistical Analysis:

- Data handling also involves basic statistical analysis, which helps in understanding and interpreting data to draw meaningful conclusions.

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