NCERT Solutions Class 9 Maths
Chapter 12: Statistics
EXERCISE 12.1

Document Information:
Class: 9 | **Subject:** Mathematics | **Chapter:** 12 | **Exercise:** 12.1
Total Questions: 9 | **Academic Year:** 2025-26
Source: www.ncertbooks.net | **Generated:** February 21, 2026

Quick Summary: In NCERT Solutions Class 9 Maths Chapter 12 Exercise 12.1, students learn fundamental concepts of data collection and graphical representation in statistics. This exercise covers bar graphs, histograms, and data interpretation techniques which are essential for building a strong foundation in statistics and scoring well in CBSE Class 9 mathematics exams.

Key Takeaways:

- Master graphical representation of data using bar graphs and histograms for both discrete and continuous data sets
- Learn to interpret statistical information from graphs and draw meaningful conclusions from visual data representation
- Understand the difference between discrete data (bar graphs) and continuous class intervals (histograms) with proper scaling techniques
- Develop skills in data analysis that form the foundation for advanced statistical measures like mean $\bar{x} = (\sum x_i)/(n)$, median, and mode calculations

Complete Solutions

Question 1

QUESTION

A survey conducted by an organisation for the cause of illness and death among the women between the ages 15 - 44 (in years) worldwide, found the following figures (in %):

S.No.	Causes	Female fatality rate (%)
1.	Reproductive health conditions	31.8
2.	Neuropsychiatric conditions	25.4
3.	Injuries	12.4
4.	Cardiovascular conditions	4.3
5.	Respiratory conditions	4.1
6.	Other causes	22.0

(i) Represent the information given above graphically.

(ii) Which condition is the major cause of women's ill health and death worldwide?

(iii) Try to find out, with the help of your teacher, any two factors which play a major role in the cause in (ii) above being the major cause.

SOLUTION

This question tests our ability to represent statistical data graphically and interpret the data to draw conclusions.

(i) Graphical Representation:

We can represent the given data using a bar graph. The causes of illness and death will be on the x-axis, and the female fatality rate (%) will be on the y-axis.

Step 1: Draw the axes

Draw a horizontal line (x-axis) and a vertical line (y-axis). Label the x-axis as "Causes" and the y-axis as "Female Fatality Rate (%)".

Step 2: Choose a scale for the y-axis

Since the fatality rates range from 4.1% to 31.8%, a suitable scale for the y-axis would be from 0% to 35%, with increments of 5%.

Step 3: Draw the bars

For each cause, draw a bar with a height corresponding to its fatality rate. For example, the bar for "Reproductive health conditions" should reach 31.8% on the y-axis. Ensure each bar is of equal width and there are equal spaces between the bars for clarity.

Step 4: Label the bars

Label each bar with the corresponding cause of illness and death.

(ii) Major Cause of Ill Health and Death:

Step 1: Identify the highest fatality rate

From the table, we can see that "Reproductive health conditions" has the highest fatality rate of 31.8%.

Answer: Reproductive health conditions.

(iii) Factors Contributing to Reproductive Health Issues:

Step 1: Consider potential factors

Several factors can contribute to reproductive health issues being a major cause of ill health and death. These can include:

Factor 1: Lack of access to quality healthcare services, especially in developing countries. This includes prenatal care, safe delivery practices, and postnatal care.

Factor 2: Socio-economic factors such as poverty, lack of education, and gender inequality. These factors can limit women's access to information and resources related to reproductive health.

ANSWER

Reproductive health conditions.

Question 2

QUESTION

The following data on the number of girls (to the nearest ten) per thousand boys in different sections of Indian society is given below:

Section	Number of girls per thousand boys
Scheduled Caste (SC)	940
Scheduled Tribe (ST)	970
Non SC/ST	920
Backward districts	950
Non-backward districts	920
Rural	930
Urban	910

(i) Represent the information above by a bar graph.

(ii) In the classroom discuss what conclusions can be arrived at from the graph.

SOLUTION

This question requires us to represent given data using a bar graph and then interpret the information presented in the graph.

(i) Representing the data with a bar graph:

Step 1: Choose the axes

We'll represent the sections of Indian society on the x-axis (horizontal axis) and the number of girls per thousand boys on the y-axis (vertical axis).

Step 2: Determine the scale for the y-axis

The data ranges from 910 to 970. A suitable scale would be from 900 to 1000 with increments of 10. This allows for clear representation of the differences.

Step 3: Draw the bars

For each section, draw a bar with a height corresponding to the number of girls per thousand boys. For example, for Scheduled Caste (SC), the bar height will be 940.

Step 4: Label the axes and provide a title

Label the x-axis as "Sections of Indian Society" and the y-axis as "Number of Girls per Thousand Boys." Give the graph a title like "Number of Girls per Thousand Boys in Different Sections of Indian Society."

(ii) Conclusions from the graph:

Step 1: Observe the highest and lowest values

The Scheduled Tribe (ST) section has the highest number of girls per thousand boys (970), while the Urban section has the lowest (910).

Step 2: Compare different sections

The number of girls per thousand boys is generally higher in Scheduled Castes (SC), Scheduled Tribes (ST), and Backward districts compared to Non-SC/ST and Non-backward districts. Rural areas also show a higher number compared to urban areas.

Step 3: Draw inferences

This data suggests that gender ratio varies across different sections of Indian society. Urban areas may face specific challenges related to the gender ratio compared to rural areas. Also, certain socially and economically disadvantaged groups (SC, ST, Backward districts) may have relatively better gender ratios compared to more advantaged groups (Non-SC/ST, Non-backward districts). Further investigation is needed to understand the underlying causes of these differences.

Question 3

QUESTION

Given below are the seats won by different political parties in the polling outcome of a state assembly elections:

Political Party	A	B	C	D	E	F
Seats Won	75	55	37	29	10	37

(i) Draw a bar graph to represent the polling results.

(ii) Which political party won the maximum number of seats?

SOLUTION

This question tests our understanding of how to represent data using a bar graph and how to interpret the data presented in a bar graph.

(i) Drawing a bar graph:

Step 1: Choose the axes

We'll represent the political parties (A, B, C, D, E, F) on the x-axis (horizontal axis) and the number of seats won on the y-axis (vertical axis).

Step 2: Determine the scale for the y-axis

The maximum number of seats won is 75. We need to choose a scale that accommodates this value. A scale of 1 unit = 10 seats is suitable. This means our y-axis will go from 0 to at least 80.

Step 3: Draw the bars

For each political party, draw a rectangular bar with its base on the x-axis. The height of the bar corresponds to the number of seats won by that party. For example, for party A, the bar's height will correspond to 75 seats.

Step 4: Label the axes and provide a title

Label the x-axis as "Political Parties" and the y-axis as "Number of Seats Won". Give the bar graph a title, such as "State Assembly Election Results".

Note: Since I cannot draw the bar graph here, imagine a bar graph following the above steps.

(ii) Identifying the political party with the maximum seats:

Step 1: Observe the bar graph (or the table)

Visually inspect the bar graph to identify the tallest bar. Alternatively, look at the table and find the highest number of seats won.

Step 2: Determine the corresponding political party

The tallest bar (or the highest number in the table) corresponds to Political Party A, which won 75 seats.

Final Answer: Party A.

ANSWER

Party A.

Question 4

QUESTION

The length of 40 leaves of a plant are measured correct to one millimetre, and the obtained data is represented in the following table:

Length (in mm)	Number of leaves
118 - 126	3
127 - 135	5
136 - 144	9
145 - 153	12
154 - 162	5
163 - 171	4
172 - 180	2

(i) Draw a histogram to represent the given data. [Hint: First make the class intervals continuous]

(ii) Is there any other suitable graphical representation for the same data?

(iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

SOLUTION

This question involves representing given data graphically using a histogram and interpreting the data. It tests the understanding of continuous class intervals and the suitability of different graphical representations.

(i) Drawing a Histogram:

The given class intervals are not continuous. We need to make them continuous by subtracting 0.5 from the lower limit and adding 0.5 to the upper limit of each class interval.

The continuous class intervals are:

117.5 - 126.5, 126.5 - 135.5, 135.5 - 144.5, 144.5 - 153.5, 153.5 - 162.5, 162.5 - 171.5, 171.5 - 180.5

Now, we can draw a histogram with these continuous class intervals on the x-axis and the number of leaves (frequency) on the y-axis. The height of each rectangle corresponds to the frequency of that class interval.

Note: Since I cannot draw a histogram here, imagine a bar graph where the bars touch each other, representing the continuous intervals. The height of each bar represents the number of leaves in that interval.

(ii) Other Suitable Graphical Representation:

Yes, a **frequency polygon** is another suitable graphical representation for the same data. A frequency polygon is formed by joining the midpoints of the top of each rectangle in the histogram with straight lines. The midpoints of the first and last class intervals are joined to the x-axis to close the polygon.

(iii) Conclusion about Maximum Number of Leaves:

No, it is not correct to conclude that the maximum number of leaves are 153 mm long. The class interval 145 - 153 has the maximum number of leaves (12). This means that most of the leaves have lengths within this range, but we cannot pinpoint the exact length as 153 mm. The data is grouped, so we only know the frequency within each interval, not the exact length of each leaf.

The correct answer is: Frequency polygon; No.

ANSWER

Frequency polygon; No.

Question 5

QUESTION

The following table gives the life times of 400 neon lamps:

Life time (in hours)	Number of lamps
300 - 400	14
400 - 500	56
500 - 600	60
600 - 700	86
700 - 800	74
800 - 900	62
900 - 1000	48

(i) Represent the given information with the help of a histogram.

(ii) How many lamps have a life time of more than 700 hours?

SOLUTION

This question tests our understanding of how to represent data using a histogram and how to interpret data from a histogram.

(i) Represent the data using a histogram:

Step 1: Understand the data

The given data represents the life times of 400 neon lamps, grouped into class intervals. The class intervals are continuous (300-400, 400-500, and so on), which is a requirement for drawing a histogram.

Step 2: Draw the axes

Draw the x-axis representing the life time (in hours) and the y-axis representing the number of lamps.

Step 3: Determine the scale

Choose an appropriate scale for both axes. For the x-axis, we can use the class intervals directly. For the y-axis, since the number of lamps ranges from 14 to 86, we can use a scale of 1 unit = 1 lamp or 1 unit = 2 lamps. A scale of 1 unit = 5 or 10 lamps would also work.

Step 4: Draw the rectangles

For each class interval, draw a rectangle with the base equal to the class interval width and the height equal to the frequency (number of lamps) for that interval.

For example:

- For the interval 300-400, the height of the rectangle will be 14.
- For the interval 400-500, the height of the rectangle will be 56.
- Continue this process for all intervals.

The resulting figure is the histogram representing the given data.

(ii) How many lamps have a life time of more than 700 hours?

Step 1: Identify the relevant intervals

We need to find the number of lamps with a life time greater than 700 hours. This includes the intervals 700-800, 800-900, and 900-1000.

Step 2: Extract the frequencies

- Number of lamps in the interval 700-800: 74
- Number of lamps in the interval 800-900: 62
- Number of lamps in the interval 900-1000: 48

Step 3: Calculate the total

Add the frequencies of these intervals to find the total number of lamps with a life time of more than 700 hours:

Final Answer: 184

ANSWER

184.

Question 6

QUESTION

The following table gives the distribution of students of two sections according to the marks obtained by them:

Section A: Marks	Frequency	Section B: Marks	Frequency
0 - 10	3	0 - 10	5
10 - 20	9	10 - 20	19
20 - 30	17	20 - 30	15
30 - 40	12	30 - 40	10
40 - 50	9	40 - 50	1

Represent the marks of the students of both the sections on the same graph by two frequency polygons. From the two polygons compare the performance of the two sections.

SOLUTION

This question requires us to represent the given data using frequency polygons and then compare the performance of the two sections based on the polygons.

Step 1: Find the class marks for each interval

The class mark is the midpoint of each class interval. It is calculated as:

For the interval 0-10, the class mark is . Similarly, we calculate the class marks for all intervals:

0-10: 5

10-20: 15

20-30: 25

30-40: 35

40-50: 45

Step 2: Represent the data using frequency polygons

To draw the frequency polygon, we plot the class marks on the x-axis and the corresponding frequencies on the y-axis. We also assume a class interval before the first and after the last with frequency zero to close the polygon. So we add class marks -5 (frequency 0) and 55 (frequency 0) for both sections.

Section A: ((-5, 0), (5, 3), (15, 9), (25, 17), (35, 12), (45, 9), (55, 0))

Section B: ((-5, 0), (5, 5), (15, 19), (25, 15), (35, 10), (45, 1), (55, 0))

Plot these points on a graph and connect them with straight lines to form the frequency polygons.

Step 3: Compare the performance of the two sections

By observing the frequency polygons, we can compare the performance of the two sections. Section B has a higher frequency in the 10-20 marks range, indicating more students scored in this range compared to Section A. Section A, on the other hand, has a higher frequency in the 20-30 and 30-40 marks range. Section A also has more students in the 40-50 range.

Overall, the performance of Section A appears slightly better as more students scored in the higher mark ranges (20-50) compared to Section B.

Final Answer: The frequency polygons are plotted as described above. Section A generally performed better than Section B.

Question 7

QUESTION

The runs scored by two teams A and B on the first 60 balls in a cricket match are given below:

Number of balls	Team A	Team B
1 - 6	2	5
7 - 12	1	6
13 - 18	8	2
19 - 24	9	10
25 - 30	4	5
31 - 36	5	6
37 - 42	6	3
43 - 48	10	4
49 - 54	6	8
55 - 60	2	10

Represent the data of both the teams on the same graph by frequency polygons. [Hint : First make the class intervals continuous.]

SOLUTION

This question requires us to represent the runs scored by two cricket teams, A and B, over the first 60 balls of a match using frequency polygons on the same graph. The key is to make the class intervals continuous before plotting.

Step 1: Make the class intervals continuous

The given class intervals are in the form 1-6, 7-12, etc. To make them continuous, we need to adjust the boundaries. We subtract 0.5 from the lower limit and add 0.5 to the upper limit of each interval.

The continuous class intervals become: 0.5-6.5, 6.5-12.5, 12.5-18.5, 18.5-24.5, 24.5-30.5, 30.5-36.5, 36.5-42.5, 42.5-48.5, 48.5-54.5, 54.5-60.5.

Step 2: Find the class marks (midpoints)

The class mark is the midpoint of each class interval. We calculate it as:

For example, for the first interval (0.5-6.5), the class mark is . Similarly, we calculate the class marks for all intervals: 9.5, 15.5, 21.5, 27.5, 33.5, 39.5, 45.5, 51.5, 57.5.

Step 3: Plot the frequency polygons

Now, we plot the class marks on the x-axis and the corresponding frequencies (runs scored) on the y-axis for both teams. For Team A, we have the points (3.5, 2), (9.5, 1), (15.5, 8), (21.5, 9), (27.5, 4), (33.5, 5), (39.5, 6), (45.5, 10), (51.5, 6), (57.5, 2). For Team B, we have the points (3.5, 5), (9.5, 6), (15.5, 2), (21.5, 10), (27.5, 5), (33.5, 6), (39.5, 3), (45.5, 4), (51.5, 8), (57.5, 10).

Join the points for each team with straight lines to create the frequency polygons. Remember to close the polygon by extending the lines to the x-axis at the beginning and end (at class marks before the first and after the last).

Final Answer: The frequency polygons representing the runs scored by Team A and Team B are plotted on the same graph using the continuous class intervals and their corresponding class marks and frequencies.

Question 8

QUESTION

A random survey of the number of children of various age groups playing in a park was found as follows:

Age (in years)	Number of children
1 - 2	5
2 - 3	3
3 - 5	6
5 - 7	12
7 - 10	9
10 - 15	10
15 - 17	4

Draw a histogram to represent the data above.

SOLUTION

This question requires us to draw a histogram for the given data, where the class intervals are of varying widths. We need to adjust the frequencies to represent the data accurately.

Step 1: Understand the concept of Histogram with varying width

When the class intervals have different widths, the height of the rectangles in the histogram is proportional to the frequency density, not the frequency itself. Frequency density is calculated as:

Step 2: Calculate the Class Width for each interval

The class width is the difference between the upper and lower limits of each class interval.

- 1 - 2: Width = 2 - 1 = 1
- 2 - 3: Width = 3 - 2 = 1
- 3 - 5: Width = 5 - 3 = 2
- 5 - 7: Width = 7 - 5 = 2
- 7 - 10: Width = 10 - 7 = 3
- 10 - 15: Width = 15 - 10 = 5
- 15 - 17: Width = 17 - 15 = 2

Step 3: Calculate the Frequency Density (adjusted frequency or height of rectangle)

Divide the frequency by the corresponding class width.

- 1 - 2: Frequency Density = 5 / 1 = 5

- 2 - 3: Frequency Density = 3 / 1 = 3
- 3 - 5: Frequency Density = 6 / 2 = 3
- 5 - 7: Frequency Density = 12 / 2 = 6
- 7 - 10: Frequency Density = 9 / 3 = 3
- 10 - 15: Frequency Density = 10 / 5 = 2
- 15 - 17: Frequency Density = 4 / 2 = 2

Step 4: Draw the Histogram

Now, we can draw the histogram. The x-axis represents the age (in years), and the y-axis represents the frequency density. The height of each rectangle corresponds to the frequency density calculated in Step 3.

- The rectangle for the interval 1-2 has a height of 5.
- The rectangle for the interval 2-3 has a height of 3.
- The rectangle for the interval 3-5 has a height of 3.
- The rectangle for the interval 5-7 has a height of 6.
- The rectangle for the interval 7-10 has a height of 3.
- The rectangle for the interval 10-15 has a height of 2.
- The rectangle for the interval 15-17 has a height of 2.

Final Answer: The histogram is drawn with age groups on the x-axis and adjusted frequencies (frequency density) on the y-axis, using the calculated heights for each rectangle.

ANSWER

Age (in years)	Frequency	Width	Length of the rectangle
1 - 2	5	1	5/1 × 1 = 5
2 - 3	3	1	3/1 × 1 = 3
3 - 5	6	2	6/2 × 1 = 3
5 - 7	12	2	12/2 × 1 = 6
7 - 10	9	3	9/3 × 1 = 3
10 - 15	10	5	10/5 × 1 = 2
15 - 17	4	2	4/2 × 1 = 2

Now, the histogram can be drawn using these lengths.

Question 9

QUESTION

100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	Number of surnames
1 - 4	6
4 - 6	30
6 - 8	44
8 - 12	16
12 - 20	4

(i) Draw a histogram to depict the given information.

(ii) Write the class interval in which the maximum number of surnames lie.

SOLUTION

This question tests our understanding of how to represent grouped data using a histogram, particularly when the class intervals are of unequal widths. We also need to identify the class interval with the highest frequency.

(i) Drawing the Histogram

Since the class intervals are of different widths, we need to adjust the heights of the rectangles in the histogram. The height (or length) of each rectangle will be proportional to the frequency density, which is calculated as Frequency / Class Width. We choose a suitable scale (e.g., a factor to make calculations easier).

Step 1: Calculate the width of each class interval

The class widths are:

1 - 4: Width = 4 - 1 = 3

4 - 6: Width = 6 - 4 = 2

6 - 8: Width = 8 - 6 = 2

8 - 12: Width = 12 - 8 = 4

12 - 20: Width = 20 - 12 = 8

Step 2: Calculate the adjusted height (length) of each rectangle

We need to adjust the heights so that the area of each rectangle represents the frequency. We can choose a common factor to simplify calculations. Let's choose a factor of 2 for easier scaling.

1 - 4: Length = (6 / 3) × 2 = 4

4 - 6: Length = (30 / 2) × 2 = 30

6 - 8: Length = (44 / 2) × 2 = 44

8 - 12: Length = (16 / 4) × 2 = 8

12 - 20: Length = (4 / 8) × 2 = 1

Now, we can draw the histogram with the number of letters on the x-axis and the adjusted lengths on the y-axis. The rectangles will have the calculated lengths for each corresponding class interval.

(ii) Identifying the Class Interval with the Maximum Number of Surnames

Step 1: Observe the frequencies

From the given data, the class interval 6 - 8 has the highest frequency (44).

Answer: The maximum number of surnames lie in the class interval 6 - 8.

ANSWER

Number of letters	Frequency	Width of interval	Length of rectangle
1 - 4	6	3	6/3 × 2 = 4
4 - 6	30	2	30/2 × 2 = 30
6 - 8	44	2	44/2 × 2 = 44
8 - 12	16	4	16/4 × 2 = 8
12 - 20	4	8	4/8 × 2 = 1

The maximum number of surnames lie in the class interval 6 - 8.

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Key Formulas

Important Formulas for Exercise 12.1

Formula / Concept	Description
Primary Data	Data collected for the first time by the researcher or investigator for a specific purpose. It is original, first-hand information.
Secondary Data	Data that has already been collected by someone else and is available from other sources, such as publications, websites, or government records.
Mean of Ungrouped Data (\barx)	The mean, or average, is calculated by summing all the observations and dividing by the total number of observations.
Formula for Mean	\barx = \textSum of all observations\textTotal number of observations \barx = \sum_i=1^n x_in Where x_i represents individual observations and n is the total number of observations.
Median of Ungrouped Data	The median is the middlemost value in a dataset when the data is arranged in either ascending or descending order.
Median (when n is odd)	If the number of observations (n) is odd, the median is the value of the \left((n+1)/(2) \right)^th observation.
Median (when n is even)	If the number of observations (n) is even, the median is the average of the \left((n)/(2) \right)^th and the \left((n)/(2) + 1 \right)^th observations.
Mode of Ungrouped Data	The mode is the value that appears most frequently in a dataset. A dataset can have one mode (unimodal), more than one mode (multimodal), or no mode at all.

Top FAQs

Q1. How many questions are in NCERT Solutions for Class 9 Maths Chapter 12 Statistics Exercise 12.1 for CBSE 2025-26?

There are exactly 9 questions in NCERT Solutions for Class 9 Maths Chapter 12 Statistics Exercise 12.1. These questions focus on Collection of Data and form the foundation for understanding statistical concepts required for CBSE board exam 2025-26.

Q2. Where can I download free PDF of NCERT Solutions for Class 9 Maths Chapter 12 Statistics Exercise 12.1 with step by step solutions?

You can download free PDF of NCERT Solutions for Class 9 Maths Chapter 12 Statistics Exercise 12.1 from the official NCERT website or various educational platforms offering step by step solutions. These PDFs are updated as per the latest CBSE syllabus 2025-26 and include detailed explanations for all 9 questions.

Q3. How many marks does Chapter 12 Statistics carry in CBSE Class 9 Maths board exam 2025-26 syllabus?

Chapter 12 Statistics carries 6 marks in CBSE Class 9 Maths board exam 2025-26 under Unit VI. Exercise 12.1 covers Collection of Data which is fundamental for understanding Mean, Median, and Mode calculations that appear in examinations.

Q4. Which is the most difficult question in NCERT Solutions Class 9 Maths Chapter 12 Statistics Exercise 12.1 for CBSE students?

Questions involving practical data collection and classification in Exercise 12.1 of Class 9 Maths Chapter 12 Statistics are often considered challenging by CBSE students. However, with step by step solutions and proper understanding of data representation concepts, all 9 questions can be solved easily for board exam 2025-26.

Q5. What is the Mean, Median, Mode Formulas explained in NCERT Solutions for Class 9 Maths Chapter 12 Statistics?

In NCERT Class 9 Maths Chapter 12 Statistics, Mean = Sum of observations/Number of observations, Median = Middle value when data is arranged in order, and Mode = Most frequently occurring value. Exercise 12.1 introduces Collection of Data concepts that are essential for applying these formulas in CBSE board exam 2025-26.

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