# NTSE 

NCERT Solutions for Class 9
MATHS - Statistics

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1. Give five examples of data that you can collect from your day-to-day life.

Sol. Five examples of data that we can collect from our day-to-day life:
$>$ Height of our classmates or weight of our classmate.
$>$ Height of first 100 plants near by our locality.
$>$ Maximum or minimum temperature of a particular month.
$>$ Time spend for watching TV in a particular week.
$>$ Rainfall in our city in last 10 years.
2. Classify the data in Q. 1 above as primary or secondary data.

Sol. We know that
When the information was collected by the investigator herself or himself with a definite objective in her or his mind, the data obtained is called primary data.
When the information was gathered from a source which already had the information stored, the data obtained is called secondary data.
According to question 1:
Primary data: Case 1, 2 and 4 are examples of primary data.
Secondary data: Case 3 and 5 are examples of secondary data.
3. The blood groups of 30 students of Class VIII are recorded as follows:
$\mathrm{A}, \mathrm{B}, \mathrm{O}, \mathrm{O}, \mathrm{AB}, \mathrm{O}, \mathrm{A}, \mathrm{O}, \mathrm{B}, \mathrm{A}, \mathrm{O}, \mathrm{B}, \mathrm{A}, \mathrm{O}, \mathrm{O}$,
$\mathrm{A}, \mathrm{AB}, \mathrm{O}, \mathrm{A}, \mathrm{A}, \mathrm{O}, \mathrm{O}, \mathrm{AB}, \mathrm{B}, \mathrm{A}, \mathrm{O}, \mathrm{B}, \mathrm{A}, \mathrm{B}, \mathrm{O}$.
Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest, blood group among these students?
Sol. According to data, 9 students have blood group A, 6 students have blood group B, 3 students have blood group AB and 12 students have blood group 0.
The frequency distribution table of 30 students is given below:

| Blood Groups | Number of students |
| :---: | :---: |
| A | 9 |
| B | 6 |
| AB | 3 |
| O | 12 |
| Total | $\mathbf{3 0}$ |

Out of these four groups, O is most common and AB is the rarest group.

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4. The heights of 50 students, measured to the nearest centimetres, have been found to be as follows:

| 161 | 150 | 154 | 165 | 168 | 161 | 154 | 162 | 150 | 151 |
| :---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 162 | 164 | 171 | 165 | 158 | 154 | 156 | 172 | 160 | 170 |
| 153 | 159 | 161 | 170 | 162 | 165 | 166 | 168 | 165 | 164 |
| 154 | 152 | 153 | 156 | 158 | 162 | 160 | 161 | 173 | 166 |
| 161 | 159 | 162 | 167 | 168 | 159 | 158 | 153 | 154 | 159 |

(i) Represent the data given above by a grouped frequency distribution table, taking the class intervals as 160 165, 165-170, etc.
(ii) What can you conclude about their heights from the table?

Sol. (i )According to given data, the minimum height is 150 cm and the maximum height is 173 cm . Therefore, the class intervals are $150-155,155-160,160-165$, etc. The grouped frequency distribution table is given below:

| Height (in cm) | Number of students (Frequency) |
| :---: | :---: |
| $150-155$ | 12 |
| $155-160$ | 9 |
| $160-165$ | 14 |
| $165-170$ | 10 |
| $170-175$ | 5 |
| Total | $\mathbf{5 0}$ |

(ii) More than $50 \%$ students have height less than 165 cm .
5. A study was conducted to find out the concentration of sulphur dioxide in the air in parts per million (ppm) of a certain city. The data obtained for 30 days is as follows:

| 0.03 | 0.08 | 0.08 | 0.09 | 0.04 | 0.17 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| 0.16 | 0.05 | 0.02 | 0.06 | 0.18 | 0.20 |
| 0.11 | 0.08 | 0.12 | 0.13 | 0.22 | 0.07 |
| 0.08 | 0.01 | 0.10 | 0.06 | 0.09 | 0.18 |
| 0.11 | 0.07 | 0.05 | 0.07 | 0.01 | 0.04 |

(i) Make a grouped frequency distribution table for this data with class intervals as $0.00-0.04,0.04-0.08$, and so on.
(ii) For how many days, was the concentration of sulphur dioxide more than 0.11 parts per million?

Sol. (i) According to the given data, the minimum concentration is 0.01 and the maximum concentration is 0.22 . Therefore, the class intervals are $0.00-0.04,0.04-0.08,0.08-0.12$, etc. Frequency table is given below:

| Concentration of Sulphur dioxide (in ppm) | Number of days (Frequency) |
| :---: | :---: |
| $0.00-0.04$ | 4 |
| $00.4-0.08$ | 9 |
| $0.08-0.12$ | 9 |
| $0.12-0.16$ | 2 |
| $0.16-0.20$ | 4 |
| $0.20-0.24$ | 2 |
| Total | $\mathbf{3 0}$ |

(ii) In 8 days, the concentration of sulphur dioxide was more than 0.11 parts per million.

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6. Three coins were tossed 30 times simultaneously. Each time the number of heads occurring was noted down as follows:

| 0 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 0 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 | 3 | 1 | 1 | 2 | 2 | 0 | 1 | 2 | 1 |
| 3 | 0 | 0 | 1 | 1 | 2 | 3 | 2 | 2 | 0 |

Prepare a frequency distribution table for the data given above.
Sol. The frequency table is given below:

| Number of heads | Frequency |
| :---: | :---: |
| 0 | 6 |
| 1 | 10 |
| 2 | 9 |
| 3 | 5 |
| Total | $\mathbf{3 0}$ |

7. The value of $\pi$ upto 50 decimal places is given below:
3.14159265358979323846264338327950288419716939937510
(i) Make a frequency distribution of the digits from 0 to 9 after the decimal point.
(ii) What are the most and the least frequently occurring digits?

Sol. (i) The frequency table is given below:

| Number | Frequency |
| :---: | :---: |
| 0 | 2 |
| 1 | 5 |
| 2 | 5 |
| 3 | 8 |
| 4 | 4 |
| 5 | 5 |
| 6 | 4 |
| 7 | 4 |
| 8 | 5 |
| 9 | 8 |
| Total | $\mathbf{5 0}$ |

(ii) 3 and 9 are the most occurring digits and 0 is the least occurring digit.
8. Thirty children were asked about the number of hours they watched TV programmes in the previous week. The results were found as follows:

| 1 | 6 | 2 | 3 | 5 | 12 | 5 | 8 | 4 | 8 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 10 | 3 | 4 | 12 | 2 | 8 | 15 | 1 | 17 | 6 |
| 3 | 2 | 8 | 5 | 9 | 6 | 8 | 7 | 14 | 12 |

(i) Make a grouped frequency distribution table for this data, taking class width 5 and one of the class intervals as 5-10.
(ii) How many children watched television for 15 or more hours a week?

Sol. (i) According to data, the least time is 1 hour and the most time is 17 hours. Therefore, the class intervals are $0-$ $5,5-10,10-15$ etc. The grouped frequency distribution table is given below:

| Time for watching TV (in hours) | Number of children (Frequency) |
| :---: | :---: |
| $0-5$ | 10 |
| $5-10$ | 13 |
| $10-15$ | 5 |
| $15-20$ | 2 |
| Total | $\mathbf{3 0}$ |

(ii) Only 2 children watched television for 15 or more hours a week.
9. 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?

Sol. (i) Taking a suitable distance, the causes are taken on x -axis. The width of each bar and distance between the two bars constant. Taking number of seats won on y-axis and suitable scale the bar graph is drawn below. As the maximum number of seats won is 75 , so the scale is 1 units $=10$ seats.

(ii) Political party A won the maximum (75) number of seats.
10. The following number of goals were scored by a team in a series of 10 matches:
$2,3,4,5,0,1,3,3,4,3$
Find the mean, median and mode of these scores.
Sol. Mean $=\frac{\text { Sum of allobservations }}{\text { Total number of observations }}$
$=\frac{2+3+4+5+0+1+3+3+4+3}{10}=\frac{28}{10}=2.8$ goals
Arranging the data in ascending order:
$0, \quad 1, \quad 2, \quad 3, \quad 3, \quad 3, \quad 3, \quad 4,42, \quad 5$
Number of observations $=10$
10 is an even number. Therefore, the median $=$ Mean of $5^{\text {th }}\left[\left(\frac{n}{2}\right)^{t h}\right]$ term and $6^{\text {th }}\left[\left(\frac{n}{2}+1\right)^{t_{h}}\right]$ term.
Hence,
Median $=\frac{1}{2}\left(5^{\text {th }}\right.$ observation $+6^{\text {th }}$ observation $)=\frac{1}{2}(3+3)=3$
Mode is the observation having maximum frequency. Here, the number 3 occurs maximum (4) times. Hence, the mode of the observations is 3 .

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