CBSE NCERT Solutions for Class 8 Mathematics Chapter 5

Back of Chapter Questions

Exercise 5.1

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 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 reasons for each.

Solution:

If data can be represented in manner of class interval, then histogram can be used to show the data.

    (A)   In this case, data cannot be divided into class interval. So, we cannot use a histogram to show the data.

    (B)   In this case, data can be divided into class interval. So, we cannot use a histogram to show the data.

    (C)   In this case, data cannot be divided into class interval. So, we cannot use a histogram to show the data.

    (D)   In this case, data can be divided into class interval. So, we cannot use a histogram to show 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 in the first hour in the morning:

WWWGBWWMGGMMWWWWGBMWBGGMWWMMWWWMWBWG
MWWWWGWMMWWMWGWMGWMMBGGW

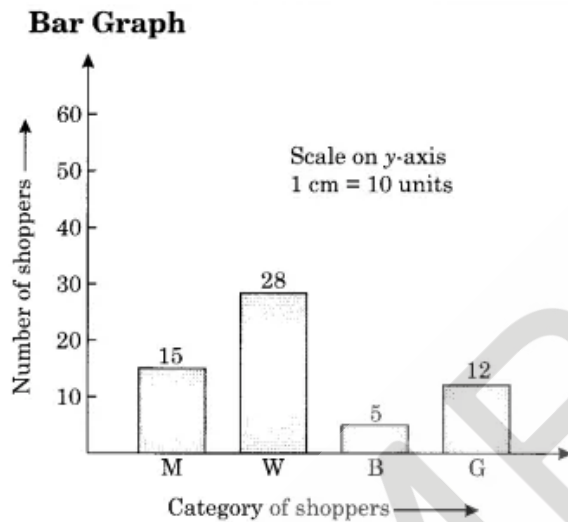Make a frequency distribution table using tally marks. Draw a bar graph to illustrate it.

Solution:

The frequency distribution table is as follows.

Shopper	Tally Marks	Number
W	𝍷𝍷𝍷 𝍷𝍷𝍷 𝍷𝍷𝍷 𝍷𝍷𝍷 𝍷𝍷𝍷 |||	28

M	⅃⅃⅃ ⅃⅃⅃ ⅃⅃⅃	15
B	⅃⅃⅃	5
G	⅃⅃⅃ ⅃⅃⅃ ‖	12

The illustration of data by bar graph is as follows.

Bar Graph

3. 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.

Solution:

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

Interval	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

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 rs 850 and more?

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

Solution:

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

| Interval	Tally marks	Frequency
$800 - 810$	|||	3
$810 - 820$	||	2
$820 - 830$			1
$830 - 840$	ℸℋℒ ||||	9
$840 - 850$	ℸℋℒ	5
$850 - 860$			1
$860 - 870$	|||	3
$870 - 880$			1
$880 - 890$			1
$890 - 900$	||||	4

	Total	30

(i)   830-840 group has the maximum number of workers

(ii)   10 workers earn more than 850

(iii)   20 workers earn less than 850
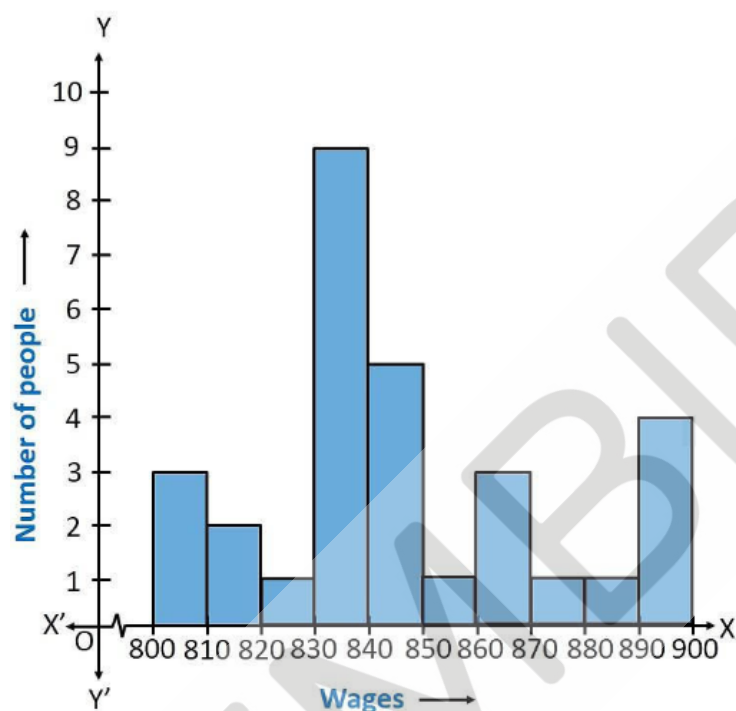
5.   The number of hours for which students of a particular class watched television during holidays is shown through the given graph.

Answer the following.

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

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

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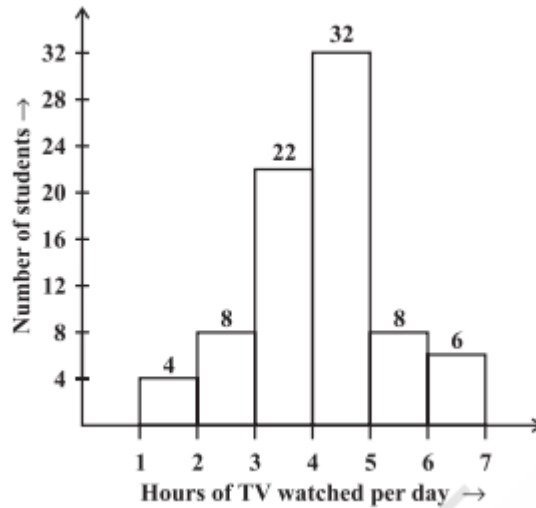
Solution:

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

(ii)   34 students watched TV for less than 4 hours.

(iii)   14 students spend more than 5 hours in watching TV.

Exercise 5.2

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:

If twenty people liked classical music, how many young people get 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?
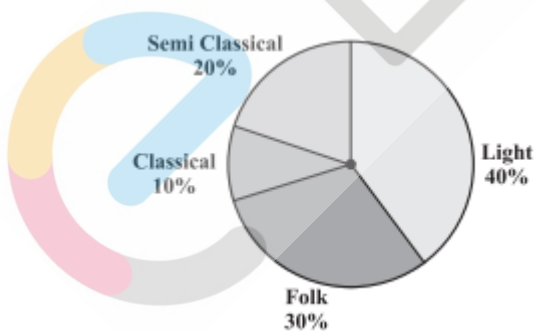
Solution:

(i)   Let the total number of people surveyed be x.

It is given that 10% of them like classical music.

10% of $x = 20$

$\Rightarrow x \times \dfrac{10}{100} = 20$

$$\Rightarrow \frac{x}{10} = 20$$

which gives $x = 200$

Hence, 200 people were surveyed.

(ii)   From the pie chart, it is clear that 40% people like light music.

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

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

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

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

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

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

Season		No. of votes
Summer		90
Rainy		120
Winter		150

(i)   which season got the most votes?

(ii)   Find the central angle of each sector?

(iii)   Draw a pie chart to show this information.

Solution:

(i)   From the given table it is clear that winter season got the maximum votes.

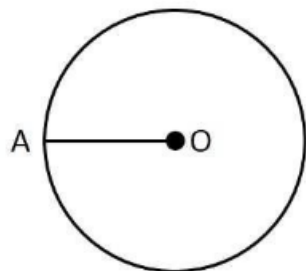(ii)   Total number of votes $= 90 + 120 + 150$

$= 360$

Central angle of summer season $= \left(\frac{90}{360}\right) \times 360° = 90°$

Central angle of winter season $= \left(\frac{150}{360}\right) \times 360° = 150°$

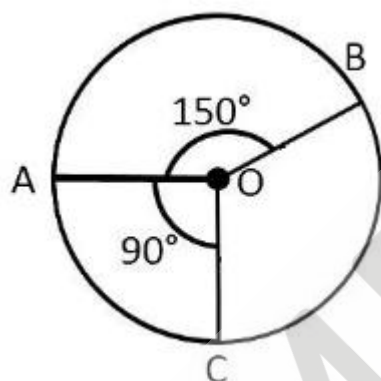Central angle of rainy season $= \left(\frac{120}{360}\right) \times 360° = 120°$

(iii)   Steps to draw a pie chart:

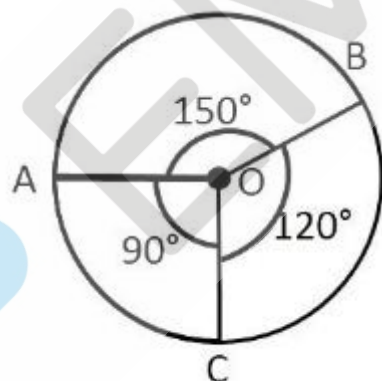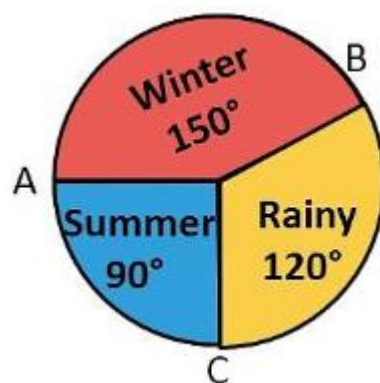Draw a circle of any radius. Mark radius as OA.

Now, using protractor draw OC 90° to OA and OB 150° to OA as shown.

The remaining portion will be 120°

Now label the pie chart as shown.

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:

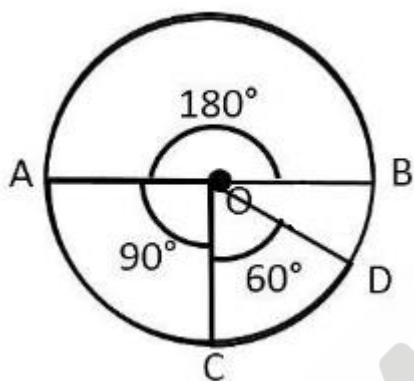| Colours	Number of people	In fraction	Central Angle
Blue	18	$\frac{18}{36} = \frac{1}{2}$	$\left(\frac{1}{2}\right) \times 360^o = 180^o$
Green	9	$\frac{9}{36} = \frac{1}{4}$	$\left(\frac{1}{4}\right) \times 360^o = 90^o$
Red	6	$\frac{6}{36} = \frac{1}{6}$	$\left(\frac{1}{6}\right) \times 360^o = 60^o$
Yellow	3	$\frac{3}{36} = \frac{1}{12}$	$\left(\frac{1}{12}\right) \times 360^o = 30^o$

Steps to draw a pie chart:
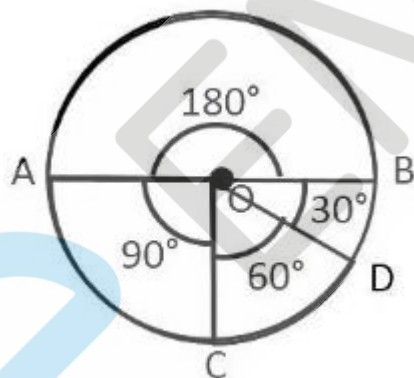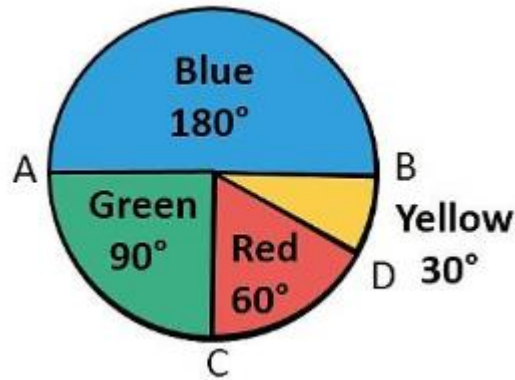
Draw a circle of any radius. Mark radius as OA.
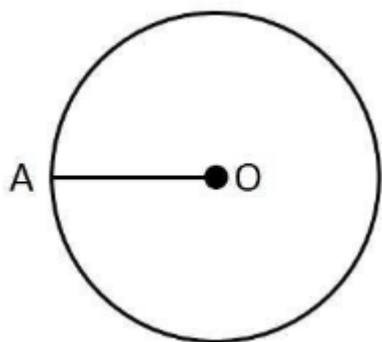
Now, using protractor draw OB 180° to OA, OC 90° to OA and OD 60° to OC as shown.


The remaining portion will be 30°

Now the label the pie chart

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 student is 540, answer the following questions.

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

   (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.
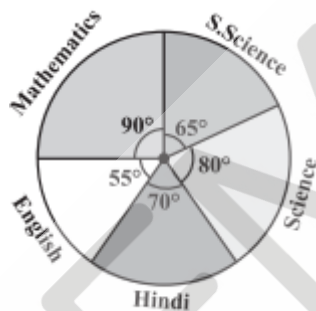
Solution:

Subject	Central Angle	Marks Obtained
Mathematics	90°	$(90°/360°) \times 540 = 135$
Social Science	65°	$(65°/360°) \times 540 = 97.5$
Science	80°	$(80°/360°) \times 540 = 120$
Hindi	70°	$(70°/360°) \times 540 = 105$
English	55°	$(55°/360°) \times 540 = 82.5$

   (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 $= 120 + 105 = 225$

Yes, the sum of 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.
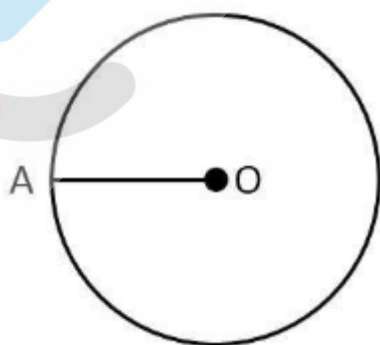
Display the data in a pie chart.

Language	Hindi	English	Marathi	Tamil	Bengali	Total
Number of students	40	12	9	7	4	72

Solution:

Language	Number of students	In fraction	Central Angle
Hindi	40	$40/72 = 5/9$	$(5/9) \times 360º = 200º$
English	12	$12/72 = 1/6$	$(1/6) \times 360º = 60º$
Marathi	9	$9/72 = 1/8$	$(1/8) \times 360º = 45º$
Tamil	7	$7/72 = 7/72$	$(7/72) \times 360º = 35º$
Bengali	4	$4/72 = 1/18$	$(1/18) \times 360º = 20º$
Total	72		

Steps to draw a pie chart:
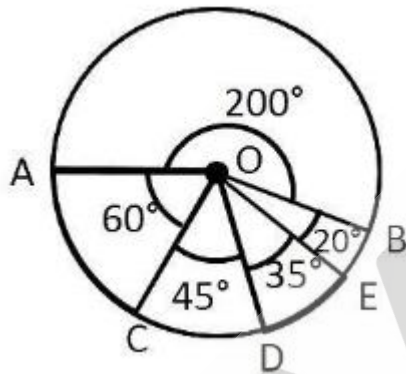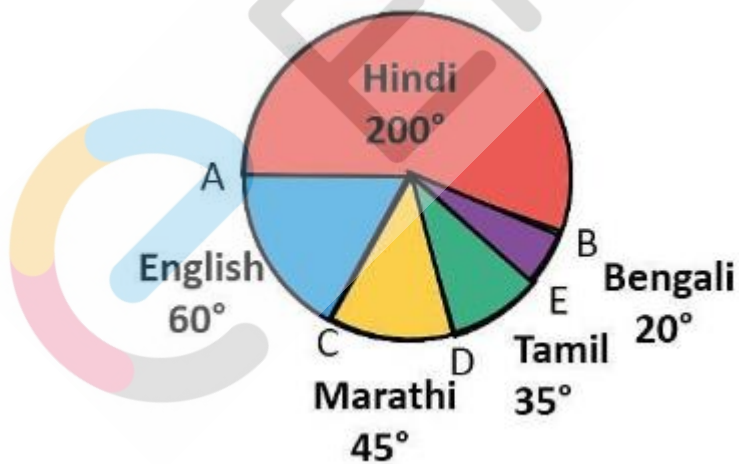

Draw a circle of any radius. Mark radius as OA.

Now, using protractor draw OB 200° with OA, OC 60° with OA, OD 45° with OC and OE 35° with OD as shown.
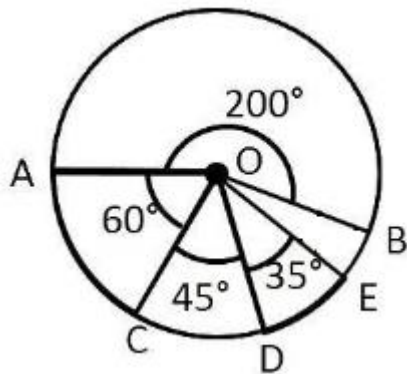
The remaining portion will be 20°.

Now label the pie chart

Exercise 5.3

1. list the outcomes you can see in these experiments

   Spinning a wheel (B) Tossing two coins together

Solution:

1 (A): There are four letters A, B, C, D in the spinning wheel. So, there are four outcomes.

1 (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

1 (A) a prime number (B) not a prime number

2 (A) a number greater than 5 (B) a number not greater than 5.

Solution:

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

1(A) When a die is thrown, outcomes of the event of getting a prime number are $2, 3$ and 5.

1(B) When a die is thrown, outcomes of event of not getting a prime number are $1, 4$ and 6.

2(A) When a die is thrown, outcomes of event of getting a number greater than 5 is 6.
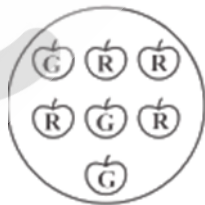
2(B) When a die is thrown, outcomes of event of getting a number not greater than 5 are $1, 2, 3, 4$ and 5.

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:

3(A) In the given spinning wheel, There are five pointers A, A, B, C and D. So, there are five outcomes. Pointer stops at D is an outcome.

Hence, the probability of the pointer stopping on D is $\frac{1}{5}$.

3(B) Total numbers of aces in a well shuffled deck of 52 playing cards is 4. So, there are four events of getting an ace.

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

3(C) Total number of apples $= 7$

Total number of red apples $= 4$

Probability of getting a red apple $= \frac{4}{7}$

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.

Getting a number 6?

Getting a number less than 6?

Getting a number greater than 6?

Getting a 1-digit number?

Solution:

4(1) Outcome of getting a number 6 from 10 separate slips is one.

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

4(2) $1, 2, 3, 4$ and 5 are the numbers which are less than 6. So, there are five outcomes.

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

4(3) $7, 8, 9$ and 10 are the four numbers which are greater than 6. So, there are four outcomes.

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

4(4) $1, 2, 3, 4, 5, 6, 7, 8$ and 9 are the nine one digit numbers out of ten.

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

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:

There are five sectors. Three sectors are green out of five sectors.

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

There is one blue sector out of five sectors.

Number of non blue sectors $= 5 - 1$ sectors

$= 4$ sectors

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

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

Solution:

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

Out of all possible outcomes $2, 3$ and 5 are the prime numbers. So, there are three outcomes out of six.

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

$1(B)$: Out of all possible outcomes $1, 4$ and 6 are not prime numbers. So, there are three outcomes out of six.

Therefore, probability of not getting a prime number $= \frac{3}{6} = \frac{1}{2}$

$2(A)$ Only 6 is greater than 5 out of all possible outcomes. So, there is one outcome out of six.

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

$2(B)$ $1, 2, 3, 4$ and 5 are the numbers not greater than 5. So, there are 5 outcomes out of 6.

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