

Unit Sixteen : Basic Geometrical Concepts



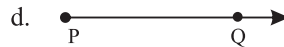
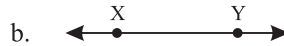
Exercise 16.1

1. Fill in the blanks :

- Ans.** a. A line has no end points.
 b. A line segment can be measured.
 c. A ray has one end point.
 d. Intersecting lines meet at a point.
 e. When two lines meet at a point forming a right angle, they are said to be perpendicular to each other.

2. Draw the following :

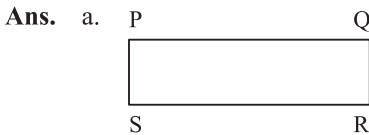
- Ans.** a. • B



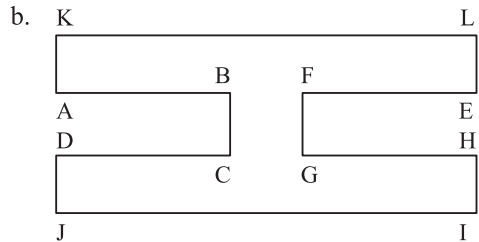
3. Name the figure shown below :

- Ans.** a. point P
 b. Line segment MN
 c. Ray LM
 d. Line AB

4. Name the line segments in each of the following :



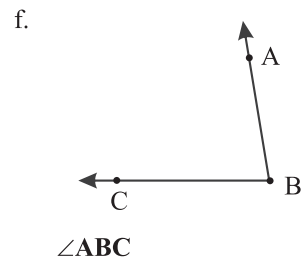
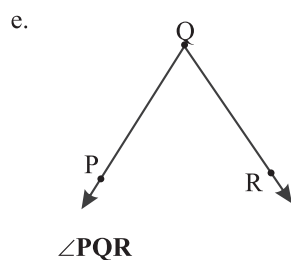
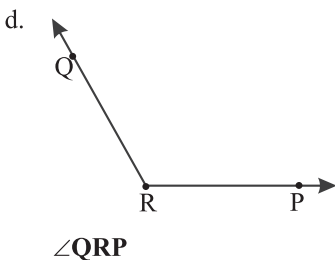
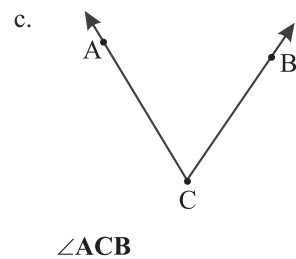
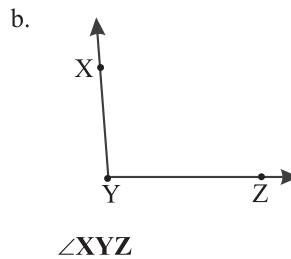
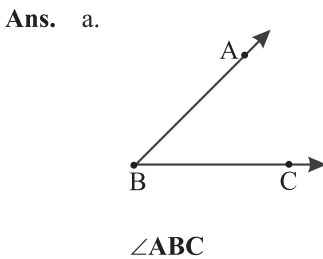
In fig. PQRS, line segments are PQ, QR, RS, SP.



In this figure, line segments are AB, BC, CD, DJ, JI, IH, HG, GF, FE, EL, LK, KA.

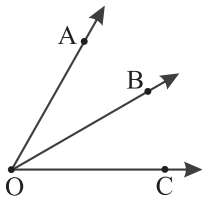
Exercise 16.2

1. Name the angles given below :



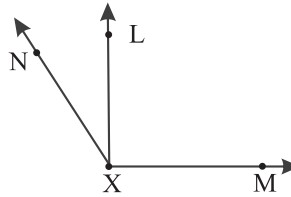
2. Name all the angles in the figures given below :

Ans. a.



$\angle AOB, \angle BOC, \angle AOC$

b.



$\angle NXL, \angle LXM, \angle NXM$

3. Three examples of angle from your surroundings. Hands of a clock, open scissor, wall of room.

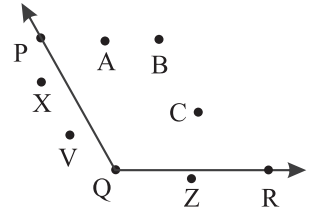
4. See the figure alongside and do the following :

Ans. a.

$\angle PQR$

b. Three points in the interior of the angle : A, B, C

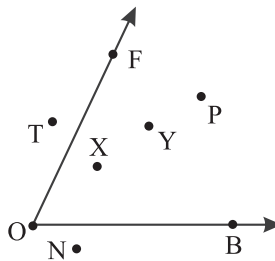
c. Three points in the exterior of the angle : X, Y, Z



5. Find the points which are interior and exterior of the angle :

Ans. Points in the interior : X, Y, P

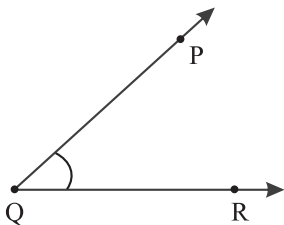
Points in the exterior : T, N



Exercise 16.3

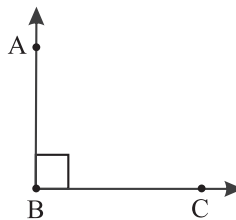
1. Measure the following angles with your protractor :

Ans. a.



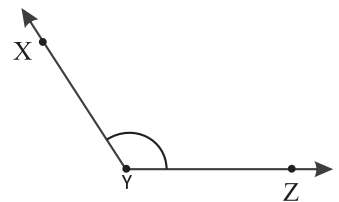
45°

b.



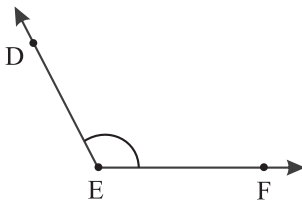
90°

c.



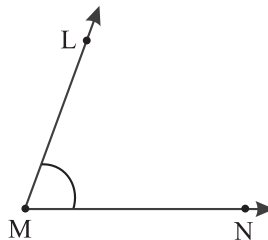
120°

d.



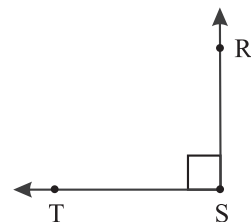
115°

e.



70°

f.



90°

2. Classify these angles according to their measurements :

Ans. a. 117° = obtuse angle

b. 28° = Acute angle

- | | | | | | |
|----------------|---|----------------|-----------------|---|----------------|
| c. 150° | = | obtuse angle | d. 270° | = | Reflex angle |
| e. 49° | = | Acute angle | f. 90.5° | = | Obtuse angle |
| g. 285° | = | Reflex angle | h. 90° | = | Right angle |
| i. 360° | = | complete angle | j. 180° | = | straight angle |
| k. 190° | = | Reflex angle | l. 60° | = | Acute angle |

3. Draw the following angles using a protractor :

Ans. Do it yourself

Mental Maths

Write 'T' for true and 'F' for false :

Ans. 1. F 2. T 3. F 4. T 5. T

Exercise 16.4

1. Answer the following questions :

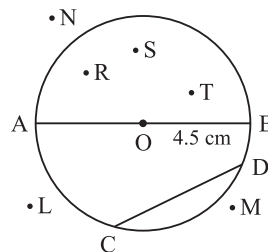
- Ans. a. We can draw infinite radii in one circle. b. Infinite number of diameters can be drawn in one circle.
- c. Yes, diameter is called the longest chord. d. No
- e. Diameter is double the radius.

2. Fill in the blanks :

- Ans. a. There is only one **centre** in a circle.
- b. The distance around a circle is called **circumference**.
- c. An **Arc** is named by 3 points.
- d. Half of a circle is called a **semicircle**.

3. Draw a circle with radius 4.5 cm. On it mark and name :

- Ans. a. The centre = O
- b. A radius = AO or OB
- c. A diameter = AB
- d. A chord = CD
- e. An arc = CD
- f. The circumference = ACDBA
- g. Interior points = R, S, T
- h. Exterior points = L, M, N



4. Draw the circles of the following radii with the help of a compass :

- Ans. a. b. c. d.

Project

Ans. Do it yourself

Let's Review

1. Tick (✓) the correct choice :

- Ans. a. ii. b. iii. c. ii. d. i. e. iii.

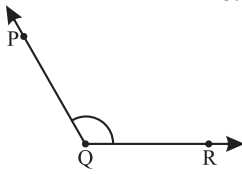
2. Fill in the blanks :

- Ans. a. A line has no end points. b. A line segment can be measured.
- c. A ray has one end point. d. The longest chord of a circle is the diameter.

3. Identify the angles as acute, right, obtuse, straight, reflex or complete angle :

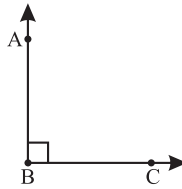
Ans.

a.



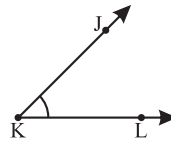
Obtuse angle

b.



Right angle

c.



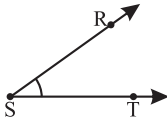
Acute angle

d.



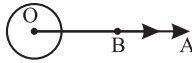
Straight angle

e.



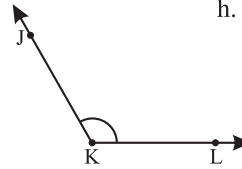
Acute angle

f.



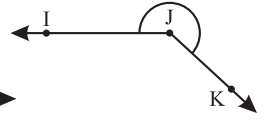
Complete angle

g.



Obtuse angle

h.



Reflex angle

Unit Seventeen : Triangles and Quadrilaterals

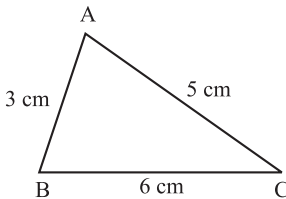
Exercise 17.1

1. In $\triangle PQR$, name :

- Ans. a. Sides of the triangle : PQ, QR, RP
 b. Angles of the triangle : $\angle P, \angle Q, \angle R$

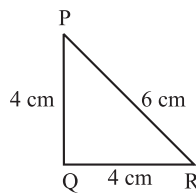
2. Classify the triangle according to the measurement of their sides :

Ans. a.



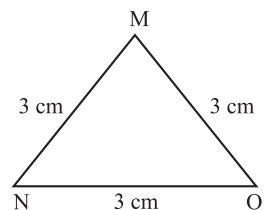
$AB \neq BC \neq CA$
 \therefore Scalene triangle

b.



$PQ = QR \neq RP$
 \therefore Isosceles triangle

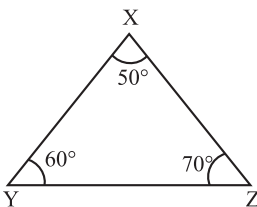
c.



$MN = NO = OM$
 \therefore Equilateral triangle

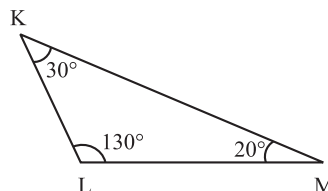
3. Identify the types of triangles and write their names :

Ans. a.



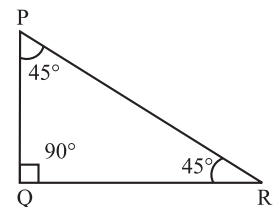
Since all the angle are acute, so it is an **acute angled triangle**.

b.



Since one angle (i.e., $\angle L$) is more than 90° .
 So, it is an **obtuse angled triangle**.

c.

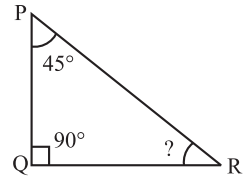


Since one angle is 90° , so it is a **right-angled triangle**.

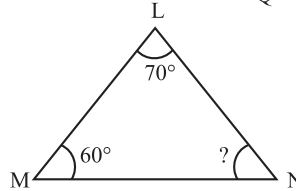
4. Find the missing angle in each triangle :

Ans. a. We know that the sum of angles of a triangle is 180° .

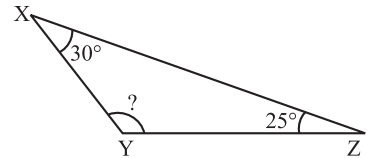
$$\begin{aligned}\angle P + \angle Q + \angle R &= 180^\circ \\ 45^\circ + 90^\circ + \angle R &= 180^\circ \\ 135^\circ + \angle R &= 180^\circ \\ \angle R &= 180^\circ - 135^\circ \\ \angle R &= 45^\circ\end{aligned}$$



$$\begin{aligned}\text{b. } \angle M + \angle L + \angle N &= 180^\circ \\ 60^\circ + 70^\circ + \angle N &= 180^\circ \\ 130^\circ + \angle N &= 180^\circ \\ \angle N &= 180 - 130 \\ \angle N &= 50^\circ\end{aligned}$$



$$\begin{aligned}\text{c. } \angle X + \angle Y + \angle Z &= 180^\circ \\ 30^\circ + \angle Y + 25^\circ &= 180^\circ \\ \angle Y + 55^\circ &= 180^\circ \\ \angle Y &= 180^\circ - 55^\circ \\ \angle Y &= 125^\circ\end{aligned}$$



5. Find out whether a triangle can be formed with the given angles or not :

Ans. a. **$52^\circ, 68^\circ, 60^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 52^\circ + 68^\circ + 60^\circ = 180^\circ \\ \therefore \text{Triangle is possible.}\end{aligned}$$

b. **$54^\circ, 75^\circ, 36^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 54^\circ + 75^\circ + 36^\circ = 165^\circ \\ \text{Since, sum of all the angles is not equal to } 180^\circ. \\ \therefore \text{Triangle is not possible.}\end{aligned}$$

c. **$105^\circ, 35^\circ, 40^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 105^\circ + 35^\circ + 40^\circ = 180^\circ \\ \text{Since, sum of all the angles is equal to } 180^\circ. \\ \therefore \text{Triangle is possible.}\end{aligned}$$

d. **$90^\circ, 25^\circ, 50^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 90 + 25 + 50 = 165^\circ \\ \text{Since, sum of all the angles } \neq 180^\circ \\ \therefore \text{Triangle is not possible.}\end{aligned}$$

e. **$68^\circ, 110^\circ, 22^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 68^\circ + 110^\circ + 22^\circ = 200^\circ \\ \text{Since, sum of all the angles } \neq 180^\circ \\ \therefore \text{Triangle is not possible.}\end{aligned}$$

f. **$115^\circ, 15^\circ, 95^\circ$**

$$\begin{aligned}\text{Sum of all the angles} &= 115^\circ + 15^\circ + 95^\circ = 225^\circ \\ \text{Since, sum of all the angles } \neq 180^\circ \\ \therefore \text{Triangle is not possible.}\end{aligned}$$

6. Find out whether a triangle can be formed with the given sides or not :

Ans. a. **6 cm, 7 cm, 8 cm**

\therefore The sum of the lengths of two sides of a triangle is always $>$ the third side.

$$6 \text{ cm} + 7 \text{ cm} > 8 \text{ cm} \qquad 7 \text{ cm} + 8 \text{ cm} > 6 \text{ cm} \qquad 6 \text{ cm} + 8 \text{ cm} > 7 \text{ cm}$$

Thus, a triangle can be formed with these given sides.

b. **5 cm, 11 cm, 9 cm**

$5\text{ cm} + 11\text{ cm} > 9\text{ cm}$, $11\text{ cm} + 9\text{ cm} > 5\text{ cm}$, $5\text{ cm} + 9\text{ cm} > 11\text{ cm}$
 Thus, a triangle can be formed with these given sides.

c. **2 cm, 8 cm, 4 cm**

$2\text{ cm} + 8\text{ cm} > 4\text{ cm}$, $8\text{ cm} + 4\text{ cm} > 2\text{ cm}$, $2\text{ cm} + 4\text{ cm} < 8\text{ cm}$
 Since, $2\text{ cm} + 4\text{ cm} < 8\text{ cm}$

Thus, a triangle can't be formed with these sides.

d. **12 cm, 14 cm, 30 cm**

$12\text{ cm} + 14\text{ cm} < 30\text{ cm}$, $14\text{ cm} + 30\text{ cm} > 12\text{ cm}$, $12\text{ cm} + 30\text{ cm} > 14\text{ cm}$
 Since, the sum of any two sides is not greater than the third side.

Thus, a triangle can't be formed with these sides.

e. **13 cm, 15 cm, 20 cm**

$13\text{ cm} + 15\text{ cm} > 20\text{ cm}$, $15\text{ cm} + 20\text{ cm} > 13\text{ cm}$, $13\text{ cm} + 20\text{ cm} > 15\text{ cm}$
 Thus, a triangle can be formed with these given sides.

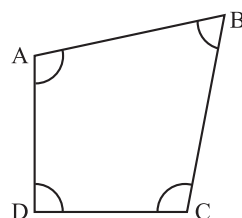
f. **8 cm, 5 cm, 10 cm**

$8\text{ cm} + 5\text{ cm} > 10\text{ cm}$, $5\text{ cm} + 10\text{ cm} > 8\text{ cm}$, $8\text{ cm} + 10\text{ cm} > 5\text{ cm}$
 Thus, a triangle can be formed with these given sides.

Exercise 17.2

1. In the given figure. ABCD is a quadrilateral. Name :

- Ans. a. Sides of the quadrilateral : **AB, BC, CD, DA**
 b. Angles of the quadrilateral : **$\angle A, \angle B, \angle C, \angle D$**
 c. Opposite sides : **AB, CD**



2. Fill in the blanks :

- Ans. a. Each angle of a rectangle is right angle.
 b. A rhombus has all its sides equal.
 c. The sum of the angles of a quadrilateral is 360° .
 d. A trapezium having two sides equal is called isosceles trapezium.
 e. All sides and angles are equal in square.

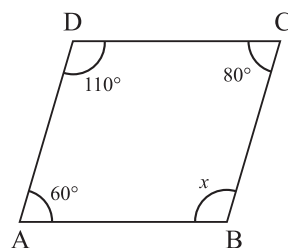
3. State true (T) or false (F) :

- Ans. a. False b. True c. False d. True e. True f. True

4. In each of the following quadrilateral, find the unknown angle.

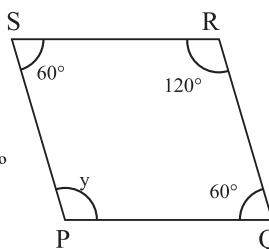
Ans. a. In quadrilateral, ABCD

$$\begin{aligned} \angle A + \angle B + \angle C + \angle D &= 360^\circ \\ 60^\circ + x + 80^\circ + 110^\circ &= 360^\circ \\ x + 250^\circ &= 360^\circ \\ x &= 360^\circ - 250^\circ \\ x &= 110^\circ \end{aligned}$$



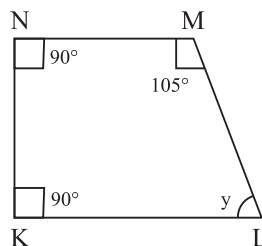
b. In quadrilateral, PQRS

$$\begin{aligned} \angle P + \angle Q + \angle R + \angle S &= 360^\circ \\ y + 60^\circ + 120^\circ + 60^\circ &= 360^\circ \\ y + 240^\circ &= 360^\circ \\ y &= 360^\circ - 240^\circ \\ y &= 120^\circ \end{aligned}$$



c. In quadrilateral, KLMN

$$\begin{aligned} \angle K + \angle L + \angle M + \angle N &= 360^\circ \\ 90^\circ + y + 105^\circ + 90^\circ &= 360^\circ \\ y + 285^\circ &= 360^\circ \\ y &= 360^\circ - 285^\circ \\ y &= 75^\circ \end{aligned}$$



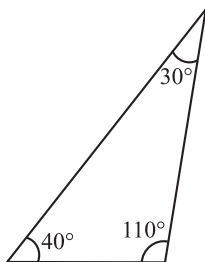
Let's Review

1. Tick (✓) the correct choice :

Ans. a. iii. b. ii. c. i. d. iii. e. i.

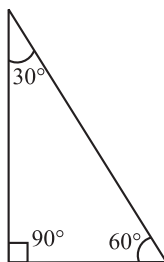
2. Classify the triangles according to their angles :

Ans. a.



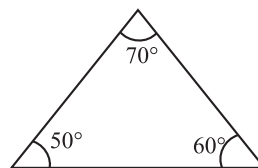
Obtuse-angled triangle

b.



Right-angled triangle

c.



Acute-angled triangle

3. Fill in the blanks :

- Ans. a. If two sides of a triangle are equal to each other, then the triangle is called an isosceles triangle.
 b. Sum of all the angles of a quadrilateral is 360°.
 c. In a rectangle, opposite sides are equal and parallel.
 d. Opposite angles in a parallelogram are equal.
 e. Every rhombus is a parallelogram.

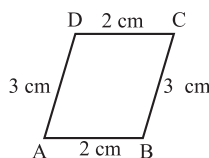
Unit Eighteen : Perimeter, Area and Volume



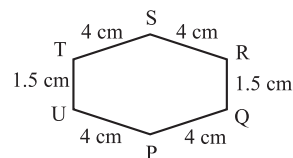
Exercise 18.1

1. Find the perimeter of the following figures :

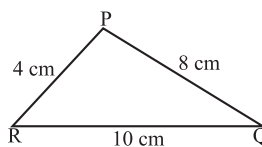
- Ans. a. Perimeter = $AB + BC + CD + DA$
 $= 2 \text{ cm} + 3 \text{ cm} + 2 \text{ cm} + 3 \text{ cm}$
 $= 10 \text{ cm}$



- b. Perimeter = $PQ + QR + RS + ST + TU + UP$
 $= 4 \text{ cm} + 1.5 \text{ cm} + 4 \text{ cm} + 4 \text{ cm} + 1.5 \text{ cm} + 4 \text{ cm}$
 $= 19 \text{ cm}$



- c. Perimeter = $PQ + QR + RP$
 $= 8 \text{ cm} + 10 \text{ cm} + 4 \text{ cm}$
 $= 22 \text{ cm}$



2. The length and breadth of some rectangles are given. Find their perimeter using the formula :

- Ans. a. $l = 6.5 \text{ cm}$, $b = 5 \text{ cm}$
 Perimeter = $2(l + b)$
 $= 2(6.5 + 5)$
 $= 2 \times 11.5 = 23 \text{ cm}$
- c. $l = 18 \text{ cm}$, $b = 11 \text{ cm}$
 Perimeter = $2(l + b)$
 $= 2(16.5 + 11)$

- b. $l = 18 \text{ cm}$, $b = 12 \text{ cm}$
 Perimeter = $2(l + b)$
 $= 2(18 + 12)$
 $= 2 \times 30 = 60 \text{ cm}$
- d. $l = 19 \text{ m}$, $b = 17 \text{ m}$
 Perimeter = $2(l + b)$
 $= 2(19 + 17)$

$$\begin{aligned}
 &= 2 \times 27.5 = 55 \text{ m} & &= 2 \times 36 = 72 \text{ m} \\
 \text{e. } l = 25.185 \text{ km, } b = 14.50 \text{ km} & & \text{f. } l = 65 \text{ cm, } b = 35 \text{ cm} \\
 \text{Perimeter} &= 2(l + b) & \text{Perimeter} &= 2(l + b) \\
 &= 2(25.185 + 14.50) & &= 2(65 + 35) \\
 &= 2 \times 39.685 = 79.37 \text{ km} & &= 2 \times 100 = 200 \text{ cm}
 \end{aligned}$$

3. Find the perimeter of the square whose dimensions are given below :

Ans. a. Side = 16 cm

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 16 \text{ cm} \\
 &= 64 \text{ cm}
 \end{aligned}$$

b. Side = 7.8 cm

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 7.8 \text{ cm} \\
 &= 31.2 \text{ cm}
 \end{aligned}$$

c. Side = 5 cm

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 5 \text{ cm} \\
 &= 20 \text{ cm}
 \end{aligned}$$

d. Side = 9.5 cm

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 9.5 \text{ cm} \\
 &= 38 \text{ cm}
 \end{aligned}$$

e. Side = 185 m

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 185 \text{ m} \\
 &= 740 \text{ m}
 \end{aligned}$$

f. Side = 6.4 m

$$\begin{aligned}
 \text{Perimeter of square} &= 4 \times \text{side} \\
 &= 4 \times 6.4 \text{ m} \\
 &= 25.6 \text{ m}
 \end{aligned}$$

4. Find the perimeter of the triangle whose dimensions are given below :

Ans. a. a = 4 cm, b = 5 cm, c = 6 cm

$$\begin{aligned}
 \text{Perimeter} &= \text{Side} + \text{Side} + \text{Side} \\
 &= 4 \text{ cm} + 5 \text{ cm} + 6 \text{ cm} \\
 &= 15 \text{ cm}
 \end{aligned}$$

b. a = 8 cm, b = 11 cm, c = 13 cm

$$\begin{aligned}
 \text{Perimeter} &= \text{Side} + \text{Side} + \text{Side} \\
 &= 8 \text{ cm} + 11 \text{ cm} + 13 \text{ cm} \\
 &= 32 \text{ cm}
 \end{aligned}$$

c. a = 14 cm, b = 16 cm, c = 18 cm

$$\begin{aligned}
 \text{Perimeter} &= \text{Side} + \text{Side} + \text{Side} \\
 &= 14 \text{ cm} + 16 \text{ cm} + 18 \text{ cm} \\
 &= 48 \text{ cm}
 \end{aligned}$$

d. a = 21 cm, b = 23 cm, c = 30 cm

$$\begin{aligned}
 \text{Perimeter} &= a + b + c \\
 &= 21 \text{ m} + 23 \text{ m} + 30 \text{ m} \\
 &= 74 \text{ m}
 \end{aligned}$$

5. Find the measure of the indicated line segment in the following figures :

Ans. a. Perimeter = 18.6 cm (given)

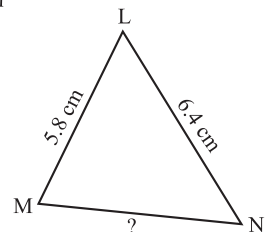
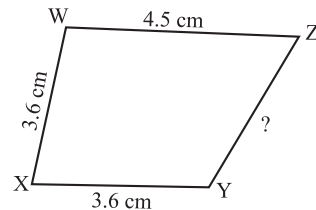
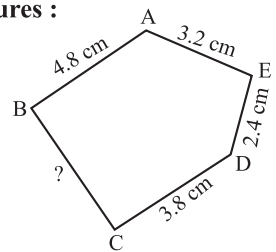
$$\begin{aligned}
 \text{Perimeter} &= AB + BC + CD + DE + EA \\
 18.6 \text{ cm} &= 4.8 \text{ cm} + ? + 3.8 \text{ cm} + 2.4 \text{ cm} + 3.2 \text{ cm} \\
 18.6 \text{ cm} &= 14.2 \text{ cm} + ? \\
 18.6 \text{ cm} - 14.2 \text{ cm} &= ? \\
 4.4 \text{ cm} &= ? \\
 \therefore BC &= 4.4 \text{ cm}
 \end{aligned}$$

b. Perimeter = 20.5 cm (given)

$$\begin{aligned}
 \text{Perimeter} &= XY + YZ + ZW + WX \\
 20.5 \text{ cm} &= 3.6 \text{ cm} + YZ + 4.5 \text{ cm} + 3.6 \text{ cm} \\
 20.5 \text{ cm} &= 11.7 \text{ cm} + YZ \\
 20.5 \text{ cm} - 11.7 \text{ cm} &= YZ \\
 8.8 \text{ cm} &= YZ \\
 \therefore YZ &= 8.8 \text{ cm}
 \end{aligned}$$

c. Perimeter = 17 cm (given)

$$\begin{aligned}
 \text{Perimeter} &= LM + MN + NL \\
 17 \text{ cm} &= 5.8 \text{ cm} + MN + 6.4 \text{ cm} \\
 17 \text{ cm} &= 12.2 \text{ cm} + MN \\
 17 \text{ cm} - 12.2 \text{ cm} &= MN \\
 4.8 \text{ cm} &= MN \\
 \therefore MN &= 4.8 \text{ cm}
 \end{aligned}$$

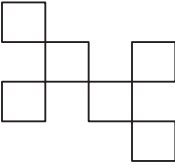
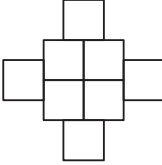
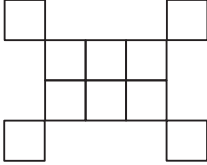


6. Solve :

- Ans.** a. Side of square park = 110 m
 Perimeter of square park = $4 \times \text{side}$
 = $4 \times 110 \text{ m}$ = 440 m
 \therefore Cost of fencing 1 m square park = ₹15
 \therefore Cost of fencing 440 m square park = $₹15 \times 440$ = ₹6600
 Thus, the cost of fencing a square park is ₹6600.
- b. $l = 25.5 \text{ cm}$, $b = 14.8 \text{ cm}$
 Perimeter of frame = $2(l + b)$ = $2(25.5 + 14.8) \text{ cm}$
 = 2×40.3 = 80.6 cm
 Perimeter of 4 such frames = $4 \times 80.6 \text{ cm}$
 = 322.4 cm
 \therefore The length of the ribbon is 322.4 cm.
- c. $l = 15 \text{ cm}$, $b = 4 \text{ cm}$
 Perimeter of the lace = $2(l + b)$ = $2(15 \text{ cm} + 4 \text{ cm})$
 = $2 \times 19 \text{ cm}$ = 38 cm
 Thus, required length of the lace is 38 cm.

Exercise 18.2

1. Find the area of the following figures by counting squares. Each square has area = 1 sq. cm.

- Ans.** a. 
 Area of the figure = 6 sq. cm.
- b. 
 Area of the figure = 8 sq. cm.
- c. 
 Area of the figure = 10 sq. cm.

2. Find the area of the rectangles with following measurements :

- Ans.** a. **Length = 7 cm, Breadth = 5 cm**
 Area of rectangle = $l \times b$ = 7×5 = 35 sq. cm.
- b. **Length = 8.5 m, Breadth = 6.5 m**
 Area of rectangle = $l \times b$ = 8.5×6.5 = 55.25 sq. m
- c. **Length = 10 cm, Breadth = 7.5 cm**
 Area of rectangle = $l \times b$ = $10 \text{ cm} \times 7.5 \text{ cm}$ = 75 sq. cm
- d. **Length = 11.7 m, Breadth = 9 m**
 Area of rectangle = $l \times b$ = 11.7×9 = 105.3 sq. m
- e. **Length = 16 m, Breadth = 9 m**
 Area of rectangle = $l \times b$ = 16×9 = 144 sq. m
- f. **Length = 2.2 km, Breadth = 2 km**
 Area of rectangle = $l \times b$ = 2.2×2 = 4.4 sq. km

3. Find the area of each of the following squares :

- Ans.** a. **Side = 9 m**
 Area of square = side \times side = $9 \text{ m} \times 9 \text{ m}$ = 81 sq. m
- b. **Side = 18.5 cm**
 Area of square = side \times side = $18.5 \text{ cm} \times 18.5 \text{ cm}$ = 342.25 sq. cm
- c. **Side = 4.5 cm**
 Area of square = side \times side = $4.5 \text{ cm} \times 4.5 \text{ cm}$ = 20.25 sq. cm

- d. **Side= 9.3 km**
 Area of square = side \times side = 9.3×9.3 = 86.49 sq. km
- e. **Side = 6.4 m**
 Area of square = side \times side = $6.4 \text{ m} \times 6.4 \text{ m}$ = 40.96 sq. m
- f. **Side = $27 \frac{1}{2}$ cm**
 Area of square = side \times side = 27.5×27.5 = 756.25 sq. cm

4. Solve :

Ans. a. Area of the floor of rectangle room = $l \times b$ = $16 \text{ m} \times 11 \text{ m}$
 = $1600 \text{ cm} \times 1100 \text{ m}$ = 1760000 sq. cm
 Area of squared floor = side \times side
 = 40×40 = 1600 sq. cm
 Number of tiles = $\frac{\text{Area of floor of rectangle room}}{\text{Area of squared floor}}$
 = $\frac{1760000}{1600}$ = $\frac{17600}{16}$ = 1100

Thus, 1100 tiles required.

b. Perimeter of square park = 176 m
 Area of square park = ?
 Side of the square park = $\frac{\text{Perimeter}}{4}$ = $\frac{176}{4}$ = 44 m
 Area of square field = side \times side
 = 44×44 = 1936 sq. m
 Cost of laying grass on 1 sq m = ₹5.50
 Cost of laying grass on 1936 sq. m = $₹5.50 \times 1936$ = ₹10648
 Thus, the cost of laying grass on it is ₹10648.

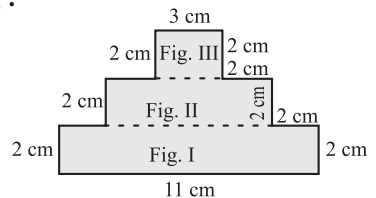
c. The area of a rectangular mat = 5.6 sq. m.
 The length of the mat = 3.5 m
 breadth = ?
 Area = length \times breadth
 5.6 = $3.5 \times b$
 b = $\frac{5.6 \text{ sq. m}}{3.5 \text{ m}}$ = 1.6 m

d. Area of a sheet of paper = $l \times b$ = 324×144 = 46656 sq. cm
 Area of a piece of paper = $l \times b$ = 16×12 = 192 sq. cm.
 Number of cards = $\frac{\text{Area of a sheet of paper}}{\text{Area of a piece of paper}}$ = $\frac{46656}{192}$
 = 243

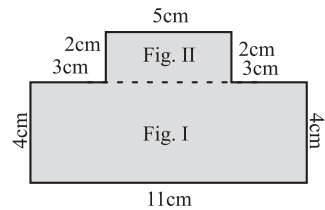
Exercise 18.3

1. Find the area of the shaded region in each of the following :

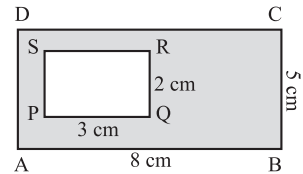
Ans. a. Area of fig. I = $l \times b$ = 11×2
 = 22 sq. cm
 Area of fig. II = $l \times b$ = $(11 - 4) \times 2$
 = 7×2 = 14 sq. cm
 Area of fig. III = $l \times b$ = 3×2
 = 6 sq. cm
 Total area of the fig. (I + II + III) = $22 + 14 + 6$ = 42 sq. cm



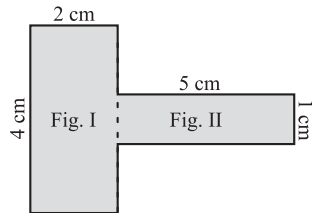
b. Area of fig. I = $l \times b$
 = 11×4
 = 44 sq. cm
 Area of fig. II = $l \times b$
 = 5×2
 = 10 sq. cm
 Total area of fig. (I + II) = $44 + 10 = 54$ sq. cm



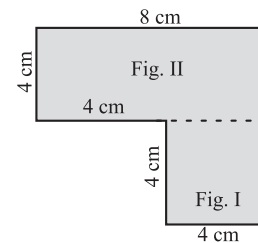
c. Area of ABCD = Length \times Breadth
 = $8 \text{ cm} \times 5 \text{ cm} = 40$ sq. cm.
 Area of PQRS = Length \times Breadth
 = $3 \text{ cm} \times 2 \text{ cm} = 6$ sq. cm.



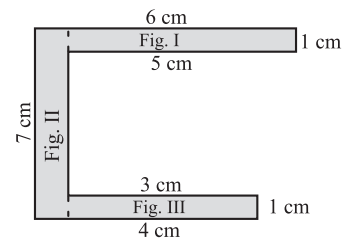
d. Area of fig. I. = Length \times Breadth
 = $4 \text{ cm} \times 2 \text{ cm} = 8$ sq. cm
 Area of fig. II = Length \times Breadth
 = $5 \text{ cm} \times 1 \text{ cm} = 5$ sq. cm
 Total Area of fig. I + II = $8 \text{ sq. cm} + 5 \text{ sq. cm} = 13$ sq. cm



e. Area of fig. I = Length \times Breadth
 = $4 \text{ cm} \times 4 \text{ cm} = 16$ sq. cm
 Area of fig. II = Length \times Breadth
 = $8 \text{ cm} \times 4 \text{ cm} = 32$ sq. cm
 Total Area of fig. I + II = $16 \text{ sq. cm} + 32 \text{ sq. cm} = 48$ sq. cm



f. Area of fig. I = Length \times Breadth
 = $5 \times 1 = 5$ sq. cm
 Area of fig. II = Length \times Breadth
 = $7 \times 1 = 7$ sq. cm
 Area of fig. III = Length \times Breadth
 = $3 \times 1 = 3$ sq. cm
 Area of fig. I + II + III = $5 \text{ sq. cm} + 7 \text{ sq. cm} + 3 \text{ sq. cm} = 15$ sq. cm



Hots

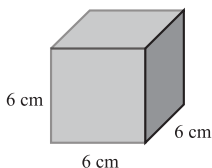
Ans. Area of the wall = $\frac{\text{Total cost of white washing}}{\text{Cost of per sq. metre}}$
 = $\frac{\text{₹}12150}{\text{₹} 25} = \text{₹}486$
 Length of the wall = 27 m
 Breadth of the wall = ?
 Area of the wall = Length \times Breadth
 486 = $27 \times \text{Breadth}$
 Breadth = $\frac{486}{27} = 18$ m

Thus, breadth of the wall is 18 m.

Exercise 18.4

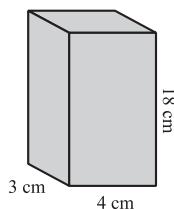
1. Calculate the volume of the following :

Ans. a.



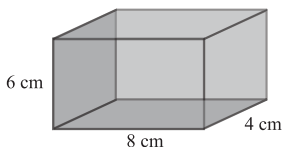
$$\begin{aligned} \text{Volume of cube} &= \text{side} \times \text{side} \times \text{side} \\ &= 6 \times 6 \times 6 \\ &= 216 \text{ sq. cm} \end{aligned}$$

b.



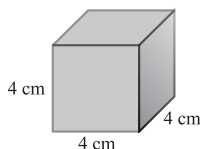
$$\begin{aligned} \text{Volume of cuboid} &= l \times b \times h \\ &= 4 \times 3 \times 18 \\ &= 216 \text{ sq. cm} \end{aligned}$$

c.



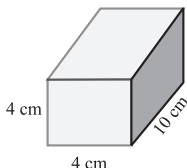
$$\begin{aligned} \text{Volume of cuboid} &= l \times b \times h \\ &= 8 \times 4 \times 6 \\ &= 192 \text{ sq. cm} \end{aligned}$$

d.



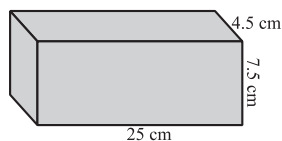
$$\begin{aligned} \text{Volume of cube} &= \text{side} \times \text{side} \times \text{side} \\ &= 4 \times 4 \times 4 \\ &= 64 \text{ cubic cm} \end{aligned}$$

e.



$$\begin{aligned} \text{Volume of cuboid} &= l \times b \times h \\ &= 4 \times 4 \times 10 \\ &= 160 \text{ cubic cm} \end{aligned}$$

f.



$$\begin{aligned} \text{Volume of cuboid} &= l \times b \times h \\ &= 25 \times 4.5 \times 7.5 \\ &= 843.75 \text{ cubic cm} \end{aligned}$$

2. Find the volume of each of the following :

Ans. a. Given : $l = 11 \text{ mm}$, $b = 8 \text{ mm}$, $h = 5 \text{ mm}$

$$\begin{aligned} \text{Volume} &= l \times b \times h \\ &= 11 \times 8 \times 5 = 440 \text{ cubic mm} \end{aligned}$$

b. Given : $l = 12.5 \text{ cm}$, $b = 11 \text{ cm}$, $h = 9 \text{ cm}$

$$\begin{aligned} \text{Volume} &= l \times b \times h \\ &= 12.5 \times 11 \times 9 = 1237.5 \text{ cubic cm} \end{aligned}$$

c. Given : $l = 9.6 \text{ m}$, $b = 8 \text{ m}$, $h = 6 \text{ m}$

$$\begin{aligned} \text{Volume} &= l \times b \times h \\ &= 9.6 \times 8 \times 6 = 460.8 \text{ cubic m} \end{aligned}$$

d. Given : $l = 12.4 \text{ m}$, $b = 9 \text{ m}$, $h = 7 \text{ m}$

$$\begin{aligned} \text{Volume} &= l \times b \times h \\ &= 12.4 \times 9 \times 7 = 781.2 \text{ cubic m} \end{aligned}$$

3. Find the area of the following :

Ans.

a. Side = 4 cm
 Volume = side \times side \times side
 = $4 \times 4 \times 4$
 = 64 cubic cm.

b. Side = 8 m
 Volume = side \times side \times side
 = $8 \times 8 \times 8$
 = 512 cubic m.

c.	Side	=	2.5 dm	d.	Side	=	12 cm
	Volume	=	side × side × side		Volume	=	side × side × side
		=	2.5 × 2.5 × 2.5			=	12 × 12 × 12
		=	15.625 cubic dm			=	1728 cubic cm
e.	Side	=	20 cm				
	Volume	=	side × side × side	=	20 × 20 × 20	=	8000 cubic cm

4. Solve the following :

Ans.

a. Here given : $l = 110$ cm, $b = 68$ cm, $h = 45$ cm
 Volume of the aquarium = $l \times b \times h$
 $= 110 \times 68 \times 45 = 336600$ cubic cm

b. Here given : side of cube = 10.5 cm
 Volume of cube = side × side × side
 $= 10.5 \times 10.5 \times 10.5 = 1157.625$ cubic cm.

c. Dimensions of an iron box : $l = 180$ cm, $b = 120$ cm, $h = 100$ cm
 Volume of an iron box = $l \times b \times h$
 $= 180 \times 120 \times 100$ cubic cm.
 \therefore Side of the cube = 60 cm
 so, volume of the cube = side × side × side
 $= 60 \times 60 \times 60$ cubic cm
 Now, number of cubes = $\frac{\text{Volume of Iron Box}}{\text{Volume of the cube}}$
 $= \frac{180 \times 120 \times 100}{60 \times 60 \times 60} = 2 \times 5 = 10$
 Thus, 10 cubes are formed.

d. Volume of brick = $20 \times 16 \times 8$ cubic cm
 Dimensions of walls : $l = 10$ m = 10×100 cm = 1000 cm
 $b = 64$ cm
 $h = 5$ m = 5×100 cm = 500 cm
 Volume of the wall = $l \times b \times h$
 $= 1000 \times 64 \times 500$ cubic cm
 Number of bricks = $\frac{\text{Volume of wall}}{\text{Volume of brick}}$
 $= \frac{1000 \times 64 \times 500}{20 \times 16 \times 8} = 125 \times 4 \times 25 = 12500$

e. Volume of an iron box = 140 m³
 breadth = 7 m, height = 2 m, length = ?
 Volume of iron box = $l \times b \times h$
 $140 = l \times 7 \times 2$
 $l = \frac{140}{14} = 10$ m

f. Volume of cubical box = 512 cubic metres.
 Let side of cubical box = a metre
 \therefore Volume of cubical box = side × side × side
 $512 = a \times a \times a$
 $512 = a^3$
 or $a^3 = 512$
 $a = \sqrt[3]{512} = 8$
 Thus, side of cubical box will be 8 m.

Science		9
Computer		16

- a. computer is most popular subject. b. Hindi is least popular subject.
c. 11 children
d. Total number of students = $6 + 4 + 11 + 9 + 16 = 46$

2. **Mayank bought balloons and he distributed these balloons among 5 children. He gave 11 balloons to Akshay, 7 balloons to Rishabh, 6 balloons to Gaurav, 8 balloons to Pradeep and 5 balloons to Vijay. Make a frequency table for this data.**


Ans. **Frequency Table**

Name of students	Tally marks	No. of Balloons
Akshay		11
Rishabh		7
Gaurav		6
Pradeep		8
Vijay		5

The above table represents distribution of balloons to five children.

3. **The number of students who come to school by different mode of transport. Study the graph and answer the questions which follow.**





























Ans. a. Number of students come by bus = $15 \times 10 = 150$ students


[∴ 1  = 10 students]

- b. Walk is used by minimum number of students.
c. Bus is used by maximum number of students.
d. Total number of students = $(4 + 6 + 12 + 10 + 15) \times 10$
= $47 \times 10 = 470$

4. **The following table shows the daily productions of colour TV sets in a factory for 7 days.**

Ans. Production of colour TV sets in a factory for 7 days.

Days	Production						
Mon							
Tue							
Wed							
Thu							
Fri							
Sat							
Sun							

Here 1  = 50 TV sets

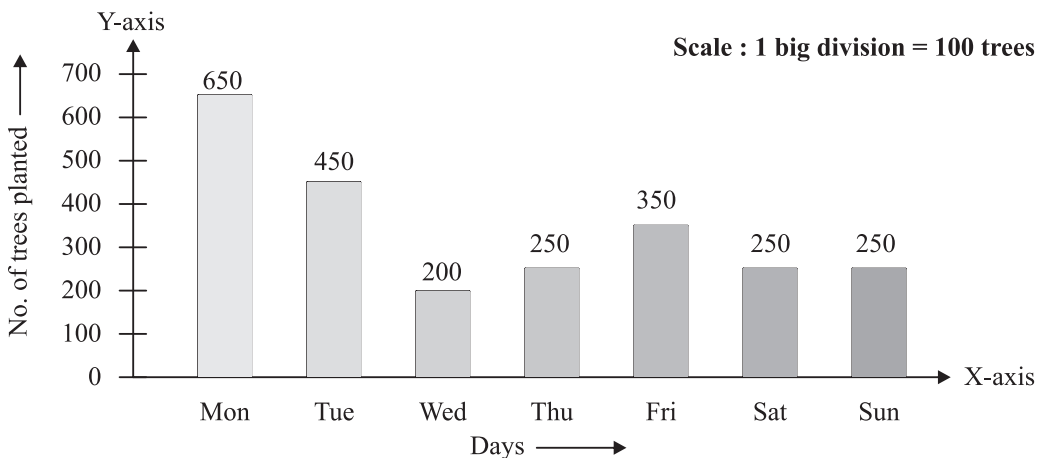
Exercise 19.2

1. Read the following bar graph and answer the questions that follow :

- Ans. a. This graph depicts the price of sugar since 2007.
 b. In year 2010 c. ₹30 per kg
 d. The required increase in price = price in 2010 – price in 2007
 = ₹40 – ₹15 = ₹25

2. The table given below shows the number of trees planted in a town in a particular week.

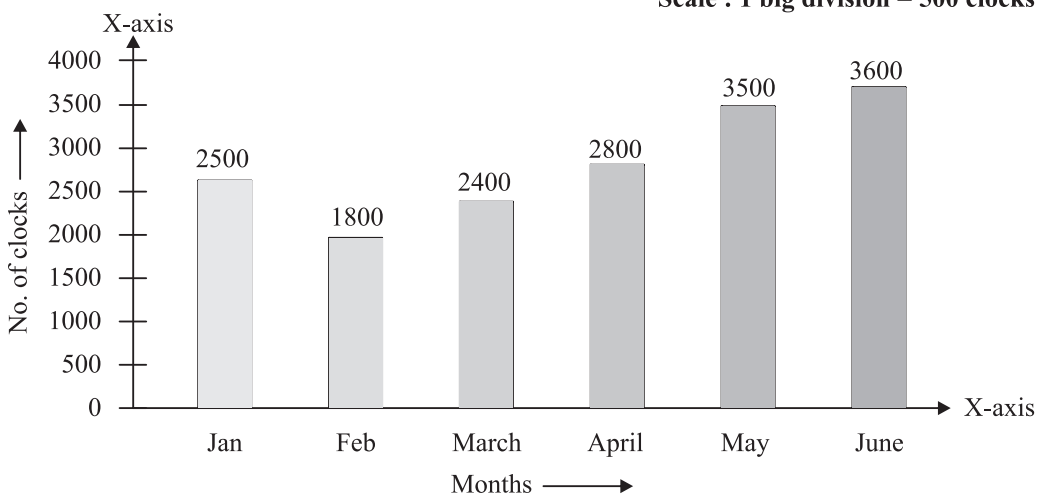
Ans.



- a. On Monday b. On Wednesday
 c. Total number of trees planted = 650 + 450 + 200 + 250 + 350 + 250 + 250 = 2400

3. The following table shows the number of clocks manufactured by a company in the first six months.

Ans.



- a. June was the most productive month. b. February was the least productive month.

Exercise 19.3

1. Examine the given pie chart showing the number of books sold of different subjects by a bookseller. Answer the following questions with the help of the given pie chart.

- Ans. a. Number of books sold by the book seller = 15,000 + 5000 + 10,000 + 5,000 + 5,000
 = 40,000



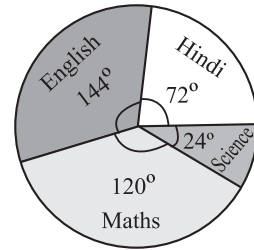
- b. Social Studies
d. Social Studies

- c. Maths, computer and GK
e. Science (i.e., 15000 – 5000 = 10000 books)

2. A library has the following books :

Ans. Total no. of books = $60 + 120 + 100 + 20 = 300$
 Angle covered = $\frac{\text{Name of subject}}{\text{Total no. of books}} \times 360^\circ$

Subject	No. of books	Angle covered
Hindi	60	$\frac{60}{300} \times 360^\circ = 72^\circ$
English	120	$\frac{120}{300} \times 360^\circ = 144^\circ$
Maths	100	$\frac{100}{300} \times 360^\circ = 120^\circ$
Science	20	$\frac{20}{300} \times 360^\circ = 24^\circ$

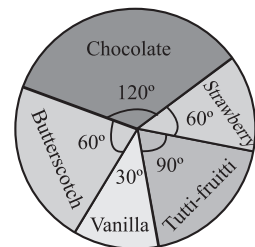


Now, we will make a pie chart from the above table.

3. The table below given information about the different flavours of ice cream liked by different students. Draw a pie chart for given information:

Ans. First we find the covered angle by each type of ice cream.
 Total no. of students = $20 + 10 + 15 + 10 + 5 = 60$
 Angle covered = $\frac{\text{Ice cream name}}{\text{Total no. of students}} \times 360^\circ$

Ice cream	No. of students	Angle covered
Chocolate	20	$\frac{20}{60} \times 360^\circ = 120^\circ$
Strawberry	10	$\frac{10}{60} \times 360^\circ = 60^\circ$
Tutti-fruitti	15	$\frac{15}{60} \times 360^\circ = 90^\circ$
Butterscotch	10	$\frac{10}{60} \times 360^\circ = 60^\circ$
Vanilla	5	$\frac{5}{60} \times 360^\circ = 30^\circ$



Let's Review

1. Tick (✓) the correct choice :

Ans. a. iii. b. iii. c. i. d. ii.

2. The following bar chart shows the runs scored in six overs bowled by a spinner in a cricket match :

Ans. a. 8 runs b. over 111 c. 1 run
 d. Average runs scored = $\frac{5+8+0+4+6+1}{6} = \frac{24}{6} = 4$

3. The book shop sells a certain number of books on five days of the week as follows :

Ans. First we find the covered angle.
 Total number of books = $60 + 50 + 70 + 55 + 65 = 300$

Day	No. of books	Angle covered
Monday	60	$\frac{60}{300} \times 360^\circ = 72^\circ$
Tuesday	50	$\frac{50}{300} \times 360^\circ = 60^\circ$
Wednesday	70	$\frac{70}{300} \times 360^\circ = 84^\circ$
Thursday	55	$\frac{55}{300} \times 360^\circ = 66^\circ$
Friday	65	$\frac{65}{300} \times 360^\circ = 78^\circ$

