20. Circles, Triangles and Quadrilaterals

Exercise 20.1

1. (a) Centre of the circle is ***O***.

(b) A radius of the circle is ***OP*** **or** ***OQ***.

(c) A diameter of the circle is ***PQ***.

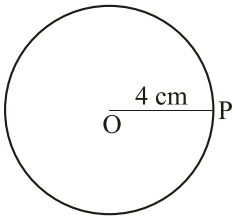
(d) A chord of the circle is ***AB*** **and** ***PQ***.

(e) A minor arc of the circle is ***ACB***.

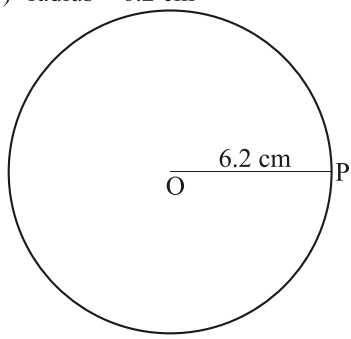
(f) A major arc of the circle is ***ARB***.

(g) Points on the interior of the circle are ***X, O*** **and** ***S***.

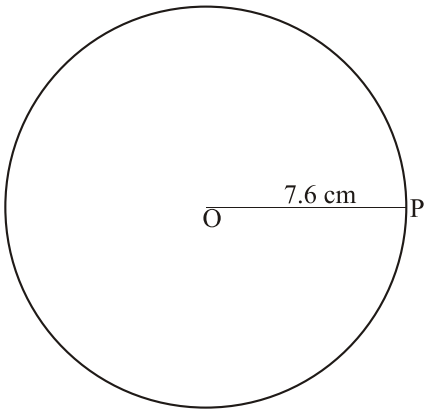
2. (a) radius = 4 cm



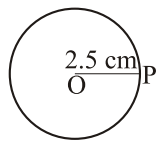
(b) radius = 6.2 cm



(c) 7.6 cm



(d) 2.5



3. (i) Radius = 5 cm

Diameter = 2 × radius = $2 \times 5 = 10$ cm.

(ii) Diameter = 16 mm

Radius = $\frac{\text{Diameter}}{2} = \frac{16}{2} = 8$ mm.

(iii) Diameter = 27 cm

Radius = $\frac{\text{Diameter}}{2} = \frac{27}{2} = 13.5$

(iv) Radius = 6.1 cm.

Diameter = $2 \times$ radius = $2 \times 6.1 = 12.2$ cm.

(v) Radius = 12.4 cm.

Diameter = $2 \times$ radius = $2 \times 12.4 = 24.8$ cm.

$\therefore$

Diameter	10 cm	16 mm	27 cm	12.2 cm	24.8 cm
Radius	5 cm	8 mm	13.5 cm	6.1 cm	12.4 cm

Exercise 20.2

1. (a) Sides of the triangle are AB, BC and CA.

(b) Vertices of the triangle are A, B and C.

(c) Angle of the triangle are $\angle A, \angle B$ and $\angle C$.

2. (a) Equilateral traingle (b) Isosceles triangle

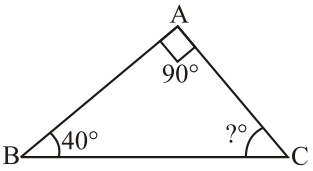
(c) Scalene traingle (d) Isosceles triangle.

3. (a) Obtused angled triangle (b) Right angled triangle

(c) Acute angled triangle (d) Right angled triangle

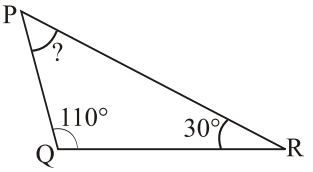
4. (a) We know that

$$\angle A + \angle B + \angle C = 180°$$
$$90° + 40° + \angle C = 180°$$
$$130° + \angle C = 180°$$
$$\angle C = 180° - 130°$$
$$\angle C = 50°$$



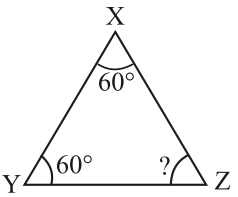
(b) We know that

$$\angle P + \angle Q + \angle R = 180°$$
$$\angle P + 110° + 30° = 180°$$
$$\angle P + 140° = 180°$$
$$\angle P = 180° - 140°$$
$$\angle P = 40°$$



(c) We know that

$$\angle X + \angle Y + \angle Z = 180°$$
$$60° + 60° + \angle Z = 180°$$
$$120° + \angle Z = 180°$$
$$\angle Z = 180° - 120°$$
$$\angle Z = 60°$$



5. (a) $6 + 5 = 11 > 10$

$5 + 10 = 15 > 6$

$6 + 10 = 16 > 15$

Since sum of 2 sides is greater than the third side, therefore, this triangle is possible to construct.

(b) $9 + 18 = 27 > 24$

$18 + 24 = 42 > 9$

$9 + 24 = 33 > 18$

Since the sum of two sides is greater than the third side, therefore to construct the triangle is possible.

(c) $4.5 + 3.5 = 8.0 > 6$

$3.5 + 6 = 9.5 > 4.5$

$4.5 + 6 = 10.5 > 3.5$

Since, the sum of two sides is greater than the third side, therefore the triangle is possible.

(d) $2.5 + 2.5 = 5 < 6$
Since the sum of two sides is smaller than the third side,
Therefore to construct this triangle is impossible.

(e) $7 + 3.5 = 10.5 < 12$
Since the sum of two sides is smaller than the third side,
therefore the construct the triangle is possible.

(f) $8 + 4 = 12 > 11$
$4 + 11 = 15 > 8$
$8 + 11 = 19 > 4$
Since the sum of two sides is smaller than the third side,
therefore to construct this triangle is possible.

6. Let the third angle $= x°$

The first angle $= 95°$
and the second angle $= 72°$
We know that Sum of the three angles = 180°

$$x + 95 + 72 = 180°$$
$$\Rightarrow \quad x + 167° = 180°$$
$$x = 180° - 167°$$
$$\Rightarrow \quad x = 13°$$

So, the third angle is 13°.

7. Let the other acute angle $= x°$

the first angle = 42°
the second angle = 90°
We know that Sum of the three angles = 180°

$$x + 42° + 90° = 180°$$
$$\Rightarrow \quad x + 132° = 180°$$
$$x = 180° - 132°$$
$$\Rightarrow \quad x = 48°$$

So, other acute angle is 48°.

8. Let the measure of each of the equal angle is $x°$
and the third angle = 116°
We know that Sum of the three angles = 180°

$$x + x + 116° = 180°$$
$$\Rightarrow \quad 2x + 116° = 180°$$
$$2x = 180° - 116°$$
$$\Rightarrow \quad 2x = 64°$$
$$x = 32°$$

So, the measure of each of the equal angles is 32°.

Exercise 20.3

1. (a) Side of the quadrilateral are AB, BC, CD and DA.
(b) Angles of the quadrilateral are $\angle A, \angle B, \angle C$ and $\angle D$.
(c) A pair of opposite sides are AB, CD and AD, BC.

2. (a) $ABCD$ is a rhombus.
(b) $ABCD$ is a rectangle.
(c) $ABCD$ is a square.

3. (a) $\angle A = 100°, \angle B = 65°, C = \angle 80°$

In quad. $ABCD$

$$\angle A + \angle B + \angle C + \angle D = 360°$$
$$100° + 65° + 80° + \angle D = 360°$$
$$245° + \angle D = 360°$$
$$\angle D = 360° - 245° = 115°$$

(b) $\angle P = 75°, \angle Q = 75°, \angle R = 105°$

In quad. $PQRS$

$$\angle P + \angle Q + \angle R + \angle S = 360°$$
$$75° + 75° + 105° + \angle S = 360°$$
$$255° + \angle S = 360°$$
$$\angle S = 360° - 255°$$
$$\angle S = 105°.$$

(c) $W = 64°, X = 138°, \angle Y = 110°$

In quad. $WXYZ$

$$\angle W + \angle X + \angle Y + \angle Z = 360°$$
$$64° + 138° + 110° + \angle Z = 360°$$
$$312° + \angle Z = 360°$$
$$\angle Z = 360° - 312°$$
$$\angle Z = 48°.$$

(d) $\angle L = 90°, \angle M = 90°, \angle N = 90°$

In quad. $\angle MNO$

$$\angle L + \angle M + \angle N + \angle O = 360°$$
$$90° + 90° + 90° + \angle O = 360°$$
$$270° + \angle O = 360$$
$$\angle O = 360° - 270°$$
$$\angle O = 90°$$

Exercise 20.3

1. (a) Sides of the quadrilateral are AB, BC, CD and DA.

(b) Angles of the qudrilateral are $\angle A, \angle B, \angle C$ and $\angle D$.

(c) AB and CD is a pair of two opposite sides.

2. (a) $ABCD$ is a rhombus.

(b) $ABCD$ is a rectangle.

(c) $ABCD$ is a square.

3. (a) $\angle A = 100°, \angle B = 65°, \angle C = 80°, \angle D = ?$

We know that

Sum of the angles in a quadrilateral = 360°

$$100° + 65° + 80° + \angle D = 360°$$
$$345° + \angle D = 360°$$
$$\angle D = 360° - 345°$$
$$\angle D = 15°$$

(b) $\angle P = 75°, \angle Q = 75°, \angle R = 105°, \angle S = ?$

We know that

Sum of the angles in a quadrilateral = 360°

$$\angle P + \angle Q + \angle R + \angle S = 360°$$

$75° + 75° + 105° + \angle S = 360°$

$255° + \angle S = 360°$

$\angle S = 360° - 255°$

$\angle S = 105°$

(c) $\angle W = 64°, \angle X = 138°, \angle Y = 110°, \angle Z = ?$

We know that

Sum of the angles in a quadrilateral = 360°

$\angle W + \angle X + \angle Y + \angle Z = 360°$

$64° + 138° + 110° + \angle Z = 360°$

$312° + \angle Z = 360°$

$\angle Z = 360° - 312°$

$\angle Z = 48°$

(d) $\angle L = 90°, \angle M = 90°, \angle N = 90°, \angle O = ?$

We know that

Sum of the angles in a quadrilateral = 360°

$\angle L + \angle M + \angle N + \angle O = 360°$

$90° + 90° + 90° + \angle O = 360°$

$270° + \angle O = 360°$

$\angle O = 360° - 270°$

$\angle O = 90°$

4. (a) **Steps of Construction :**

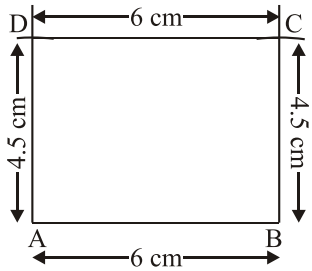
(i) Draw a line segment $AB = 6$ cm.

(ii) Draw angles of 90° at A and B with the help of protector.

(iii) Taking A and B as a centre and 4.5 cm as a radius, draw an arc which cut at D and C respectively.

(iv) Join CD.

Thus $ABCD$ is a required rectangle.



(b) **Steps of Construction :**

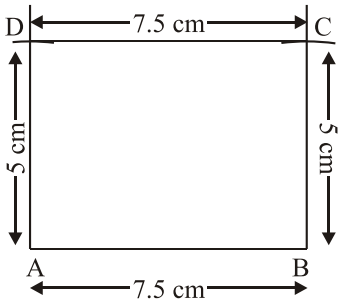
(i) Draw a line segment $AB = 7.5$ cm.

(ii) Draw angles of 90° at A and B with the help of protector.

(iii) Taking A and B as a centre and 5 cm as a radius, draw an arc which cut at D and C respectively.

(iv) Join CD.

Thus $ABCD$ is a required rectangle.



(c) **Steps of Construction :**

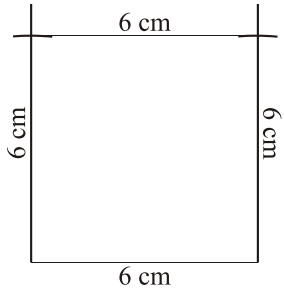
(i) Draw a line segment $PQ = 6$ cm.

(ii) Draw angles of 90° at P and Q with the help of protector.

(iii) Taking P and Q as a centre and 6 cm as a radius, draw an arc which cut at S and R respectively.

(iv) Join RS.

Thus $PQRS$ is a required rectangle.



(d) **Steps of Construction :**

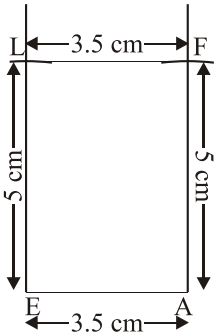
(i) Draw a line segment $EA = 3.5$ cm.

(ii) Draw angles of 90° at E and A with the help of protector.

(iii) Taking E and A as a centre and 5 cm as a radius, draw an arc which cut at L and F respectively.

(iv) Join LF.

Thus $LEAF$ is a required rectangle.



MCQ's

1. (a) **2.** (c) **3.** (b) **4.** (c)

21. Perimeter, Area and Volume

Exercise 21.1

1. (a) $\overline{AB} = 6$ cm, $\overline{BC} = 11$ cm, $\overline{CA} = 9$ cm.

Perimeter of $ABC = \overline{AB} + \overline{BC} + \overline{CA}$

$= 6 + 11 + 9 = 26$ cm.

(b) $\overline{PQ} = \overline{QR} = \overline{RP} = 8.3$

Perimeter of $\Delta PQR = \overline{PQ} + \overline{QR} + \overline{RP}$

$= 8.3 + 8.3 + 8.3 = 24.9$ cm.

(c) $\overline{XY} = \overline{YZ} = 7.5$ cm, $\overline{ZX} = 12$ cm.

Perimeter of $\Delta XYZ = XY + YZ + ZX$

$= 7.5 + 7.5 + 12 = 15 + 12 = 27$ cm.

2. (a) length $(l) = 6$ cm.

breadth $(b) = 4$ cm.

Perimeter of the rectangle $= 2(l + b) = 2(6 + 4)$

$= 2 \times 10 = 20$ cm.

(b) length $(l) = 5$ cm.

breadth $(b) = 2.5$ cm.

Perimeter of the rectangle $= 2(l + b) = 2(5 + 2.5)$

$= 2 \times 7.5 = 15$ cm.

(c) length $(l) = 3$ cm.

breadth $(b) = 1.2$ cm.

Perimeter of the rectangle $= 2(l + b) = 2(3 + 1.2)$

$= 2 \times 4.2 = 8.4$ cm.

3. (a) Side of the square = 6 cm.

Perimeter of the square $= 4 \times$ side

$= 4 \times 6 = 24$ cm.

(b) Side of the square = 5 cm.

Perimeter of the square $= 4 \times$ side

$= 4 \times 5 = 20$ cm.

(c) Side of the square = 8.5 cm.

Perimeter of the square $= 4 \times$ side

$= 4 \times 8.5 = 34$ cm.

4. (i) For square

Side of the square = 4.5 cm.

Perimeter of the square $= 4 \times$ side

$= 4 \times 4.5 = 18$ cm.

(ii) Perimeter of the square = 624 m.

Side of the square $= \dfrac{\text{Perimeter}}{4}$

$= \dfrac{624}{4} = 156$ m.

(iii) Side of the square = 9.25 cm.

Perimeter of the square $= 4 \times$ side

$= 4 \times 9.25 = 37$ cm.

(iv) Perimeter of the square = 216 m.

Side of the square $= \dfrac{\text{Perimeter}}{4} = \dfrac{216}{4} = 54$ m.

Side of the square	Perimeter
4.5 cm.	18 cm.
156 m	624 m
9.25 cm	37 cm
54 m	216 m

(v) For rectangle

$l = 140$ cm, $p = 400$ cm,

$b = \dfrac{p}{2} - l \quad \Rightarrow \quad b = \dfrac{400}{2} - 140$

$b = 200 - 140 \quad \Rightarrow \quad b = 60$ cm.

(vi) $l = 4.3$, $b = 2.8$ m.

$p = 2(l + b) \quad \Rightarrow \quad p = 2(4.3 + 2.8)$

$p = 2 \times 7.1 \quad \Rightarrow \quad p = 14.2$ m.

(vii) $b = 30$ m, $p = 190$ m.

$l = \dfrac{p}{2} - b \quad \Rightarrow \quad l = \dfrac{190}{2} - 30$

$l = 95 - 30 \quad \Rightarrow \quad l = 65$ m.

(viii) $b = 15$ m, $p = 68$ m.

$l = \dfrac{p}{2} - b \quad \Rightarrow \quad l = \dfrac{68}{2} - 15$

$l = 34 - 15 \quad \Rightarrow \quad l = 19$ m.

Length	Breadth	Perimeter of rectangle
140 cm.	60 cm.	400 cm.
4.3 m.	2.8 m.	14.2 m.
65 m.	30 m.	190 m.
19 m.	15 m.	68 m.

5. Perimeter of the square = 64 m.

$$\text{Side of the square} = \frac{\text{Perimeter}}{4}$$

$$= \frac{64}{4} = 16 \text{ m.}$$

So, sides of the square are 16 m.

6. Length of the table $(l) = 25$ cm.

Breadth of the table $(b) = 16$ cm.

Perimeter of the table $(p) = 2(l + b)$

$= 2(25 + 16)$

$= 2 \times 41 = 82$ cm.

So, the length of the lace is 82 cm.

7. Side of the square = 110 m.

Perimeter of the square $= 4 \times 110 = 440$ m.

$\because$ Cost of fencing 1 m = ₹ 15

$\therefore$ Cost of fencing 440 m. $= 15 \times 440 =$ ₹ 6600

So, the cost of fencing the park is ₹ 6600.

8. Length of two equal sides = 25 cm.

Length of the third side = 36 cm.

Perimeter of the triangle = sum of 3 sides

$= 25 + 25 + 36$

$= 50 + 36 = 86$ cm.

So, the perimeter of the triangle is 86 cm.

9. Length of the frame = 5.5 cm.

Breadth of the frame = 4.8 cm.

Perimeter of the frame $= 2(l + b)$

$= 2(5.5 + 4.8)$

$= 2 \times 10.3 = 20.6$

So, required length of the ribbon will be 20.6 cm.

Length of the ribbon required to 4 such pictures $= 4 \times 20.6 = 8.24$ cm.

So, required length of the ribbon to frame 4 such pictures is 8.24 cm.

Exercise 21.2

1. (a) Side of the square = 2.2 cm.

Area of the square = side × side

$= 2.2 \times 2.2 = 4.84 \text{ cm}^2$

(b) Length of the rectangle = 4.7 cm.

Breadth of the rectangle = 2.5 cm.

Area of the rectangle $= l \times b$

$= 4.7 \times 2.5 = 11.75 \text{ cm}^2$

(c) Base of the triangle = 4 cm.

Height of the triangle = 2.5 cm.

$$\text{Area of the triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$= \frac{1}{2} \times 4 \times 2.5$$

$$= 2 \times 2.5 = 5 \text{ cm}^2$$

(d) Side of the square = 3.9 cm.

Area of the square $= 3.9 \times 3.9 = 15.21\,\text{cm}^2$.

2. (a) $l = 9\,\text{cm}$. $b = 4.5\,\text{cm}$

$\text{Area} = l \times b = 9 \times 4.5 = 40.5\,\text{cm}^2$

(b) $l = 16.5\,\text{cm}$, $b = 8\,\text{cm}$

$\text{Area} = l \times b = 16.5 \times 8 = 132\,\text{cm}^2$

(c) $l = 27\,\text{cm}$, $b = 12\,\text{cm}$.

$\text{Area} = l \times b = 27 \times 12 = 324\,\text{cm}^2$

3. Height of the tile = 24 cm $= 24 \times 10\,\text{mm} = 240$ mm.

Base of the tile = 40 cm. $= 40 \times 10\,\text{mm} = 400$ mm.

$$\text{Area of the tile} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 400 \times 240$$

$$= 200 \times 240 = 48000\,\text{mm}^2$$

So, the area of tile is $48000\,\text{mm}^2$.

4. Length of the field = 256 m.

$$\text{Breadth of the field} = \frac{1}{4} \times \text{length}$$

$$= \frac{1}{4} \times 256 = 64\,\text{m}.$$

$\text{Area of the field} = l \times b = 256 \times 64 = 16384\,\text{m}^2$

So, the area of the rectangular field is $16384\,\text{m}^2$.

5. Length of the room = 16 m.

Breadth of the room = 11 m.

$\text{Area of the room} = l \times b = 16 \times 11 = 176\,\text{m}^2$

$$\text{Side of the square tile} = 40\,\text{cm.} = \frac{40}{100}\,\text{m.} = \frac{2}{5}$$

$$\text{Area of the square tile} = \text{side} \times \text{side} = \frac{2}{5} \times \frac{2}{5}$$

$$\text{No. of tiles} = \frac{\text{Area of the room}}{\text{Area of square tile}} = \frac{16 \times 11}{\frac{2}{5} \times \frac{2}{5}}$$

$$= \frac{16 \times 11 \times 5 \times 5}{2 \times 2}$$

$$= 4 \times 11 \times 25 = 1100\,\text{tiles}.$$

So, the required no. of tiles are 1100.

6. Perimeter of the square field = 176 m.

$$\text{Side of the square field} = \frac{\text{Perimeter}}{4}$$

$$= \frac{176}{4} = 44\,\text{m}.$$

$$\text{Area of the square field} = \text{side} \times \text{side}$$

$$= 44 \times 44 = 1936\,\text{m}^2$$

$\because$ The cost of laying grass 1 m^2 = ₹ 5.50

$\therefore$ The cost of laying grass 1936 m^2 = 1936×5.5 = ₹ 10,648

So, the area of the field is 1936 m^2 and the cost of laying the grass on it is ₹ 10,648.

7. The area of the rectangular mat = 5.6 m^2

The length of the rectangular mat = 3.5 m

$\therefore$ The breadth of the rectangular mat $= \frac{\text{Area}}{\text{length}}$

$$= \frac{5.6}{3.5} = \frac{\overset{8}{\cancel{56}}}{\underset{5}{\cancel{35}}} = 1.6\,\text{m}.$$

So, the breadth of the rectangular mat is 1.6 m.

8. Area of the sheet of the paper = 324×144 cm^2

Area of the card = 16×12 cm^2

$$\text{No. of cards} = \frac{\overset{81}{\cancel{324}} \times \overset{3}{\cancel{144}}}{\underset{4}{\cancel{16}} \times \cancel{12}}$$

$$= 81 \times 3 = 243 \text{ cards.}$$

9. The distance covered by the boy = 800 m.

No. of rounds = 5

So, the perimeter of the square park $= \frac{800}{5} = 160\,\text{m}.$

Side of the square park $= \frac{\text{Perimeter}}{4}$

$$= \frac{160}{4} = 40\,\text{m}.$$

So, the area of the park = $40 \times 40 = 1600\,m^2$.

10. Length of the rectangle = 50 cm.

Beadth of the rectangle = 45 cm.

Area of the rectangle = 50×45

$= 2250\,cm^2$

Side of the square = 48 cm.

Area of the square = 48×48

$= 2304\,cm^2$

So, the square has more area.

Difference between these areas = $2304 - 2250$

$= 54\,cm^2$

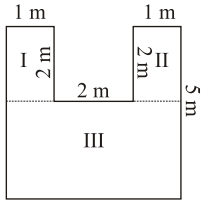
Thus square has more area by 54 cm^2.

11. (a) Area of fig. I = $l \times b = 2 \times 1 = 2\,m^2$

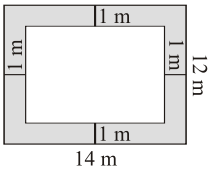
Area of fig. II = $l \times b = 2 \times 1 = 2\,m^2$

Area of fig. III = $l \times b = 4 \times 3 = 12\,m^2$

So, the area of the given fig. = $2 + 2 + 12 = 16\,m^2$



(b) Area of bigger square $= l \times b = 14 \times 12 = 168\,\text{m}^2$



Area of smaller square $= l \times b$

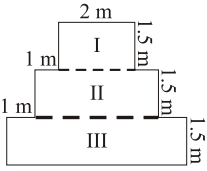
$= (14-2)(12-2)$

$= 12 \times 10$

$= 120\,\text{m}^2$

$\therefore$ Area of shaded region $= 168 - 120 = 48\,\text{m}^2$

(c) Area of fig. I $= l \times b = 2 \times 1.5 = 3\,\text{m}^2$



Area of fig. II $= l \times b = (1+2+1) \times 1.5$

$= 4 \times 1.5 = 6\ \text{m}^2$

Area of fig. III $= l \times b$

$= (1+1+2+1+1) \times 1.5$

$= 6 \times 1.5 = 9\,\text{m}^2$

So, Area of the given fig. $= 3 + 6 + 9 = 18\,\text{m}^2$

Exercise 21.3

1. (a) Length of the cuboid $(l) = 4$ cm.

Breadth of the cuboid $(b) = 1$ cm.

Height of the cuboid = 2 cm.

Volume of the cuboid $= l \times b \times h$

$= 4 \times 1 \times 2 = 8\,\text{cm}^3$.

(b) Length of the cuboid = 5 cm.

Breadth of the cuboid = 5 cm.

Height of the cuboid = 7 cm.

Volume of the cuboid $= l \times b \times h$

$= 5 \times 5 \times 7$

$= 25 \times 7 = 175\,\text{cm}^3$.

(c) Side of the cube = 1.5 cm.

Volume of the cube $= (\text{side})^3$

$= (1.5)^3 = 3.375\,\text{cm}^3$.

2. Base of the cuboid = 24 cm.

Length of the cuboid = 7 cm.

Height of the cuboid = 5 cm.

Volume of the cuboid = length × base × height

$= 7 \times 24 \times 5 = 840\,\text{cm}^3$

So, the volume of the cuboid is 840 cm^3.

3. Length of the tank = 12 m.

Breadth of the tank = 8 m.

Depth of the tank = 7 m.

Volume of the tank = length × breadth × depth

$= 12 \times 8 \times 7 = 672\,\text{m}^3$

So, the volume of the tank is 672 m^3.

4. Length of the brick = 20 cm.

Breadth of the brick = 16 cm.

Height of the brick = 8 cm.

Volume of the brick $= l \times b \times h$

$= 20 \times 16 \times 8\,\text{cm}^3$

Length of the wall = 10 m.

$= 10 \times 100\,\text{cm} = 1000\,\text{cm}$

Breadth of the wall = 64 cm.

Height of the wall = 5 m.

$= 5 \times 100\,\text{cm.} = 500\ \text{cm.}$

Volume of the wall $= l \times b \times h$

$= 1000 \times 64 \times 500\,\text{cm}^3$

$$\text{No. of bricks} = \frac{\text{Volume of the wall}}{\text{Volume of the brick}}$$

$$\text{No. of bricks} = \frac{1000 \times \overset{8}{\cancel{64}} \times 500}{20 \times 16 \times \underset{1}{\cancel{8}}} = \frac{\overset{250}{\cancel{500}} \times \overset{1}{\cancel{8}} \times 50}{\underset{1}{\cancel{2}} \times \underset{1}{\cancel{16}}}$$

$= 250 \times 50 = 12500$ bricks.

So, 12500 bricks will be required to build the wall.

5. Length of the tank = 160 cm.

Depth of the tank = 45 cm.

Capacity of the tank containing water $= 576\,l = 576 \times 1000\,\text{cm}^3$

Now, volume of the tank = Length × Width × Height

$$\text{Width} = \frac{\text{Volume of the tank}}{\text{Length} \times \text{Height}}$$

$$= \frac{\overset{36}{\cancel{144}}}{\cancel{576} \times 1000} = \frac{\overset{4}{\cancel{36}} \times \overset{20}{\cancel{100}}}{\cancel{160} \times 5} = \frac{\cancel{36} \times \cancel{100}}{\cancel{45}}$$

$= 4 \times 20 = 80\,\text{cm.}$

So, the width of the tank is 80 cm.

6. Volume of the metal box $= 180 \times 120 \times 100\,\text{cm}^3$

Length of the cube = 60 cm.

Volume of the cube $= (\text{length})^3$

$= (60)^3 = 60 \times 60 \times 60\,\text{cm}^3$

$$\text{No. of cubes} = \frac{\text{Volume of the metal box}}{\text{Volume of the cube}}$$

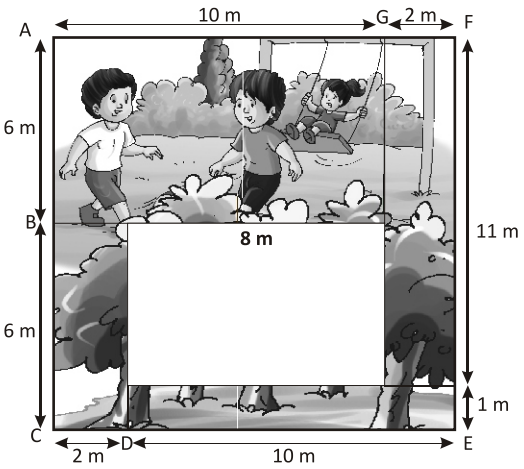
$$= \frac{\overset{3}{\cancel{180}} \times \overset{2}{\cancel{120}} \times 100}{\underset{1}{\cancel{60}} \times \underset{1}{\cancel{60}} \times 60} = \frac{3 \times 2 \times 10}{6} = 10\ \text{cubes.}$$

MCQ's

1. (c) **2.** (b) **3.** (c) **4.** (b).

Worksheet

All the paths are of the same size, hence, there is no shortest path.

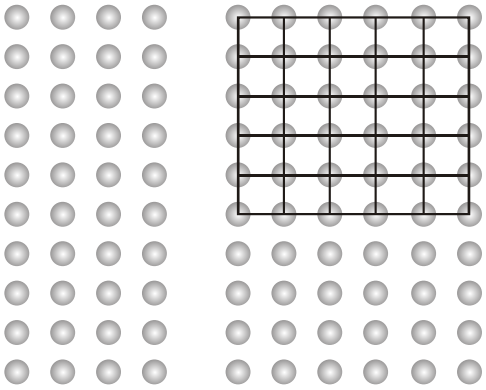


Yes, we can find the measure of the missing side.

22. Patterns

Exercise 22.1

1.



2. (a)

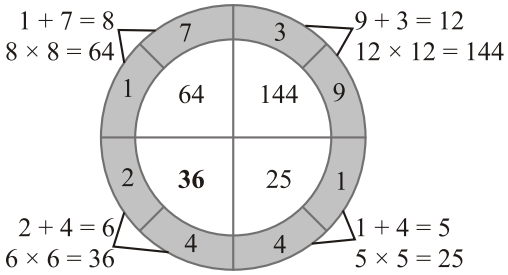
8	**1**	6
3	**5**	**7**
4	9	2

(b)

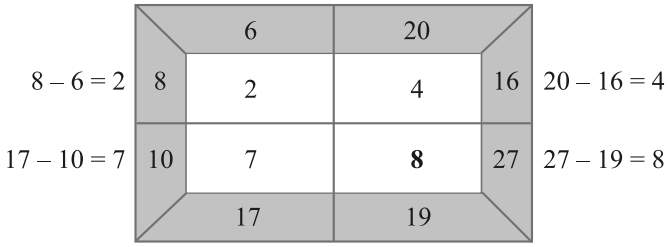
22	29	6	13	20
28	**10**	**12**	19	**21**
9	11	18	25	27
15	17	24	26	**8**
16	**23**	30	7	14

3. (a) 21 can be arranged in a triangular pattern.
(b) 5 cannot be arranged in a triangular pattern.
(c) 10 can be arrange in a triangular pattern.
(d) 45 can be arranged in a triangular pattern.
(e) 77 cannot be arranged in a triangular pattern.
(f) 108 cannot be arranged in a triangular pattern.

4. (a)



(b)



MCQ's

1. (b) **2.** (b) **3.** (c).

23.Data Handling

Exercise 23.1

1. (a) 13 books are issued on Monday.
(b) On Tuesday and Thursday, the same number of books were issued.
(c) The maximum books were issued on Friday.
(d) 97 books were issued in the week.

2. 1, 2, 3, 1, 2, 2, 2, 3, 1, 1, 1, 1, 3, 2, 2, 1, 1, 1, 2, 2

(a)

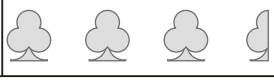
Number of children in 20 families		
Number of children	**Tally marks**	**Frequency**
1	𝍸 ||||	9
2	𝍸 |||	8
3	|||	3

(b) 9 students have no brother or sister.
(c) 3 families have three children.
(d) 9 families have one child.
(e) 8 families have two children.

Exercise 23.2

1. Here 1  = 50 trees

1  = 25 trees

Tree	No. of trees
Mango	
Neem	
Banyan	
Peepal	
Palm	

2. Here 1  = 8 ice-creams

Day	Number of Ice-cream
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

(a) On Wednesday and Thursday, the same number of ice-creams were sold.
(b) 240 ice-creams were sold in the week.
(c) On Friday, maximum ice-creams were sold.

Average sell of ice-creams $= \dfrac{\text{Total ice-creams}}{\text{Total days}}$

$= \dfrac{32+48+40+40+80}{5}$ ice-creams.

$= \dfrac{240}{5} = 48$

So, the average sell of ice-creams in a week is 48.

3. Here 1  = 10 marks

and  = 5 marks

Subject	Marks
Hindi	
English	
Mathematics	
Science	
Social Studies	

(a) In Mathematics, he got the highest marks.
(b) In Social Studies, he got the minimum marks.
(c) He secured 385 marks in the annual exams.
(d) His average score $= \dfrac{\text{Total marks}}{\text{Total subjects}}$

$= \dfrac{385}{5}$

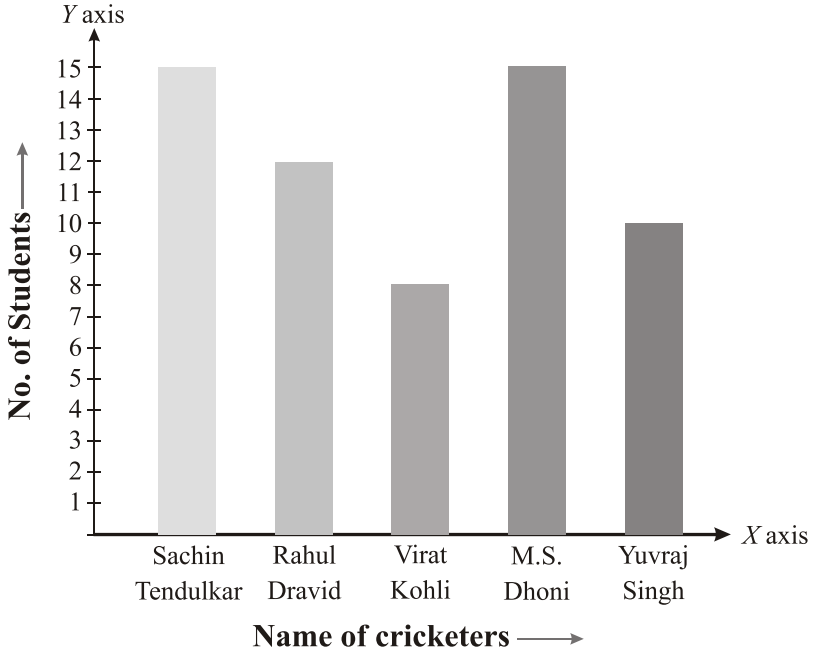
$= 77$

So, his average score in annual marks is 77.

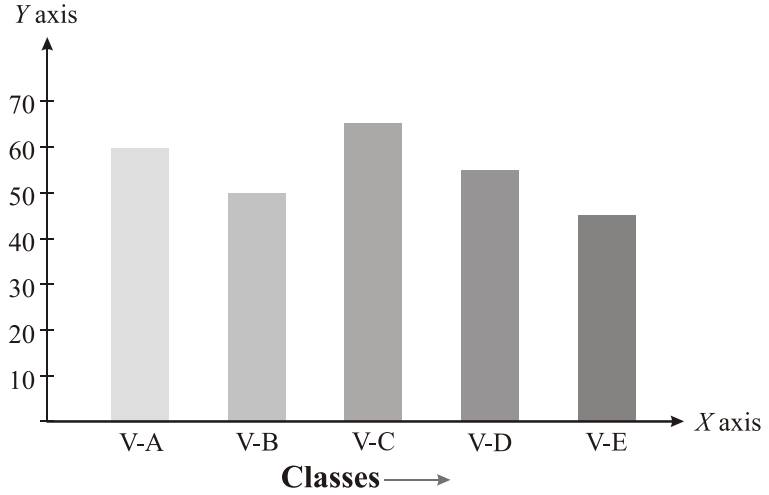
Exercise 23.3

1. (a) On Wednesday, the minimum number of students were present. The minimum number of students were 20.
(b) On Friday, the maximum number of students were present the maximum number of students were 90.
(c) On Tuesday, more students were present.
(d) 60 students were present on Thursdsay.
(e) The total attendance marked during the week is 300.

2.



3.



Exercise 23.4

1. (a) Chocolate flavour is most popular.
(b) Straw-berry flavour is most popular.
(c) Vanilla flavour is more popular than Mango flavour.
(d) The flavours in ascending order of their popularly are :
Straw-berry < Mango < Vanilla < Chocolate.

2. (a) Pizza is liked by maximum number of students.
(b) Chips is liked by minimum number of students.
(c) Biscuits is liked more.
(d) The snacks in descending order of their popularity are :
Pizza > Biscuits > Samosas > Burger > Chips

MCQ's

1. (b) **2.** (a) **3.** (a) **4.** (c).

Formative Assessment-4

1. (b) **2.** (c) **3.** (a) **4.** (c) **5.** (a). **6.** (a) height (b) same (c) right (d) triangular (e) 5.
7. (a) True (b) False (c) True (d) False (e) False.

Summative Assessment-2

1. (a) 46°C into °F

$$°F = \frac{9}{5}°C + 32°$$

$$\Rightarrow \quad °F = \frac{9}{5} \times 46° + 32°$$

$$°F = \frac{414°}{5} + 32°$$

$$\Rightarrow \quad °F = \frac{414° + 5 \times 32°}{5}$$

$$°F = \frac{414° + 160°}{5}$$

$$\Rightarrow \quad °F = \frac{574°}{5}$$

$$°F = 114.8°$$

$$\therefore \quad 46°C = 114.8°F$$

(b) 310°F into °C

$$°C = \frac{5}{9}(°F - 32°)$$

$$\Rightarrow \quad °C = \frac{5}{9}(310° - 32°)$$

$$°C = \frac{5}{9} \times 278°$$

$$\Rightarrow \quad °C = 154.44°$$

$\therefore$ 310°F = 154.44°C

(c) 80 km/hr into m/sec

$$80 \text{ km/hr} = \overset{40}{\cancel{80}} \times \frac{5}{\cancel{18}_{9}} = \frac{200}{9} = 22.22 \text{ m/sec.}$$

(d) $50l\,650ml$ into ml

$1l = 1000ml$

$$50l\,650ml = 50l + 650ml$$
$$= 50 \times 1000ml + 650ml$$
$$= 50000ml + 650ml$$
$$= 50650ml.$$

2. (a) C.P. = ₹ 225 and S.P. = ₹ 312.50

Profit = S.P. – C.P

= 312.5 – 225 = 87.5

3. Length of the rope = 25 m 84 cm. = 2584 cm.

No. of pieces = 8

Length of each piece $= \dfrac{\text{Length of the rope}}{\text{No. of pieces}}$

$= \dfrac{2584}{8} = 323$ cm.

The length of each piece is 323 cm.

4. No. of chairs = 6

$\because$ Cost of one chair = ₹ 325.75

$\therefore$ Cost of 6 chairs = 325.75 × 6

= ₹ 1954.5

So, Fatima paid ₹ 1954.5 for 6 chairs.

5. School time = 7:43 a.m. = 0743 hours

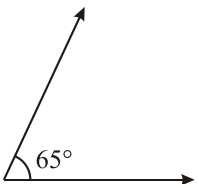
Leaving time = 1:13 p.m. = 1313 hours

hrs	min
12	60 + 13 = 73
~~13~~	~~13~~
− 07	43
5	30

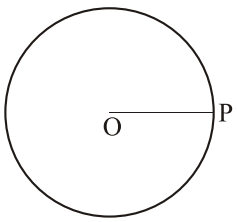
Duration of time = 5 hours 30 minutes

So, he spends 5 hours 30 minutes in the school.

6. (a) $\angle 65°$



(b) A circle with 6 cm. radius.



7. Length of the cuboid = 40 cm.

Breadth of the cuboid = 27 cm.

Height of the cuboid = 18 cm.

Volume of the cuboid $= l \times b \times h$

$= 40 \times 27 \times 18$

$= 19440\ \text{cm}^3$

8. Distance covered by the car = 186 km.

Time taken by the car = 4 hours

Speed of the car $= \dfrac{\text{Distance}}{\text{Time}}$

$$= \frac{186}{4} = 46.5 \text{ km/hr.}$$

Distance covered by the bus = 140 km.

Time taken by the bus = 3 hours

$$\text{Speed of the bus} = \frac{\text{Distance}}{\text{Time}}$$

$$= \frac{140}{3} = 46.66 \text{ km/hr.}$$

So, Bus is running faster than car.

9. $P = ₹\ 16{,}000,\ R = 2\%,\ T = 2$ years

$$\text{S.I.} = \frac{P \times R \times T}{100}$$

$$= \frac{16000 \times 2 \times 2}{100}$$

$$= 160 \times 4 = ₹\ 640$$

$$\text{Amount} = P + \text{S.I.}$$

$$= 16{,}000 + 640 = ₹\ 16640$$

So, the amount payable after 2 years was ₹ 16,640.

10.