

CHAPTER 13

PERIMETER AND AREA

1. The length and breadth of a rectangular piece of land are 500 m and 300 m, respectively. Find

(i) Its area (ii) the cost of the land, if 1 m² of the land costs ₹ 10,000.

Solution:-

From the question, it is given that

Length of the rectangular piece of land = 500 m

Breadth of the rectangular piece of land = 300 m

Then,

(i) Area of rectangle = Length $\times$ Breadth

$$= 500 \times 300$$

$$= 150000 \text{ m}^2$$

(ii) Cost of the land for 1 m² = ₹ 10000

$$\text{Cost of the land for } 150000 \text{ m}^2 = 10000 \times 150000$$

$$= ₹ 1500000000$$

2. Find the area of a square park whose perimeter is 320m.

Solution:-

From the question, it is given that

Perimeter of the square park = 320 m

$$4 \times \text{Length of the side of park} = 320 \text{ m}$$

Then,

$$\text{Length of the side of the park} = 320/4$$

$$= 80 \text{ m}$$

So, the area of the square park = (Length of the side of the park)²

$$= 80^2$$

$$= 6400 \text{ m}^2$$

3. Find the breadth of a rectangular plot of land if its area is 440 m² and the length is 22 m. Also, find its perimeter.

Solution:-

From the question, it is given that

$$\text{Area of the rectangular plot} = 440 \text{ m}^2$$

$$\text{Length of the rectangular plot} = 22 \text{ m}$$

We know that,

$$\text{Area of the rectangle} = \text{Length} \times \text{Breadth}$$

$$440 = 22 \times \text{Breadth}$$

$$\text{Breadth} = 440/22$$

$$\text{Breadth} = 20 \text{ m}$$

Then,

$$\text{Perimeter of the rectangle} = 2(\text{Length} + \text{Breadth})$$

$$= 2 (22 + 20)$$

$$= 2(42)$$

$$= 84 \text{ m}$$

∴ Perimeter of the rectangular plot is 84 m.

4. The perimeter of a rectangular sheet is 100 cm. If the length is 35 cm, find its breadth.

Also, find the area.

Solution:-

From the question, it is given that

Perimeter of the rectangular sheet = 100 cm

Length of the rectangular sheet = 35 cm

We know that,

Perimeter of the rectangle = 2 (Length + Breadth)

$$100 = 2 (35 + \text{Breadth})$$

$$(100/2) = 35 + \text{Breadth}$$

$$50 - 35 = \text{Breadth}$$

$$\text{Breadth} = 15 \text{ cm}$$

Then,

Area of the rectangle = Length $\times$ Breadth

$$= 35 \times 15$$

$$= 525 \text{ cm}^2$$

$\therefore$ Area of the rectangular sheet is 525 cm²

5. The area of a square park is the same as that of a rectangular park. If the side of the square park is 60 m and the length of the rectangular park is 90 m, find the breadth of the rectangular park.

Solution:-

From the question, it is given that

The area of a square park is the same as that of a rectangular park.

Side of the square park = 60 m

Length of the rectangular park = 90 m

We know that,

Area of the square park = (One of the sides of the square)²

$$= 60^2$$

$$= 3600 \text{ m}^2$$

Area of the rectangular park = 3600 m^2 ... [$\because$ given]

$$\text{Length} \times \text{Breadth} = 3600$$

$$90 \times \text{Breadth} = 3600$$

$$\text{Breadth} = 3600/90$$

$$\text{Breadth} = 40 \text{ m}$$

6. A wire is in the shape of a rectangle. Its length is 40 cm, and its breadth is 22 cm. If the same wire is rebent in the shape of a square, what will be the measure of each side?

Also, find which shape encloses more area.

Solution:-

By reading the question, we can conclude that the perimeter of the square is the same as the perimeter of the rectangle.

From the question, it is given that

$$\text{Length of the rectangle} = 40 \text{ cm}$$

$$\text{Breadth of the square} = 22 \text{ cm}$$

Then,

$$\text{Perimeter of the rectangle} = \text{Perimeter of the Square}$$

$$2 (\text{Length} + \text{Breadth}) = 4 \times \text{side}$$

$$2 (40 + 22) = 4 \times \text{side}$$

$$2 (62) = 4 \times \text{side}$$

$$124 = 4 \times \text{side}$$

$$\text{Side} = 124/4$$

$$\text{Side} = 31 \text{ cm}$$

$$\text{So, the area of the rectangle} = (\text{Length} \times \text{Breadth})$$

$$= 40 \times 22$$

$$= 880 \text{ cm}^2$$

$$\text{Area of square} = \text{side}^2$$

$$= 31^2$$

$$= 31 \times 31$$

$$= 961 \text{ cm}^2$$

$\therefore$ Square-shaped wire encloses more area.

7. The perimeter of a rectangle is 130 cm. If the breadth of the rectangle is 30 cm, find its length. Also, find the area of the rectangle.

Solution:-

From the question, it is given that

$$\text{Perimeter of the rectangle} = 130 \text{ cm}$$

$$\text{Breadth of the rectangle} = 30$$

We know that

$$\text{Perimeter of rectangle} = 2 (\text{Length} + \text{Breadth})$$

$$130 = 2 (\text{length} + 30)$$

$$130/2 = \text{length} + 30$$

$$\text{Length} + 30 = 65$$

$$\text{Length} = 65 - 30$$

$$\text{Length} = 35 \text{ cm}$$

Then,

$$\text{Area of the rectangle} = \text{Length} \times \text{Breadth}$$

$$= 35 \times 30$$

$$= 1050 \text{ cm}^2$$

8. A door of length 2 m and breadth 1 m is fitted in a wall. The length of the wall is 4.5 m, and the breadth is 3.6 m (Fig). Find the cost of whitewashing the wall if the rate of whitewashing the wall is ₹ 20 per m².



Solution:-

From the question, it is given that

Length of the door = 2 m

Breadth of the door = 1 m

Length of the wall = 4.5 m

Breadth of the wall = 3.6 m

Then,

Area of the door = Length $\times$ Breadth

$$= 2 \times 1$$

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

Area of the wall = Length $\times$ Breadth

$$= 4.5 \times 3.6$$

$$= 16.2 \text{ m}^2$$

$$\text{So, area to be whitewashed} = 16.2 - 2 = 14.2 \text{ m}^2$$

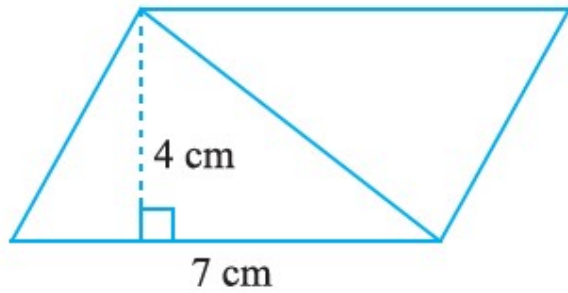
Cost of whitewashing 1 m² area = ₹ 20

Hence, the cost of whitewashing 14.2 m² area = 14.2×20

$$= ₹ 284$$

9. Find the area of each of the following parallelograms.

(a)



Solution:-

From the figure,

Height of parallelogram = 4 cm

Base of parallelogram = 7 cm

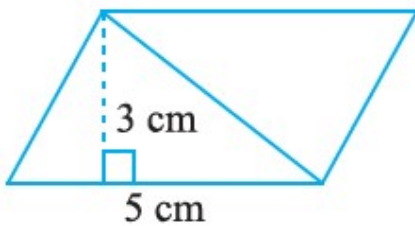
Then,

Area of parallelogram = Base $\times$ Height

$$= 7 \times 4$$

$$= 28 \text{ cm}^2$$

(b)



Solution:-

From the figure,

Height of parallelogram = 3 cm

Base of parallelogram = 5 cm

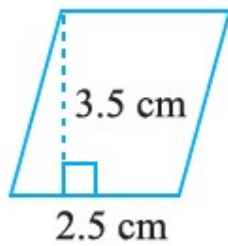
Then,

Area of parallelogram = Base $\times$ Height

$$= 5 \times 3$$

$$= 15 \text{ cm}^2$$

(c)



Solution:-

From the figure,

Height of parallelogram = 3.5 cm

Base of parallelogram = 2.5 cm

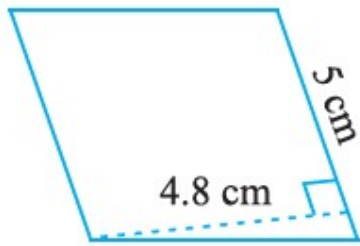
Then,

Area of parallelogram = Base $\times$ Height

$$= 2.5 \times 3.5$$

$$= 8.75 \text{ cm}^2$$

(d)



Solution:-

From the figure,

Height of parallelogram = 4.8 cm

Base of parallelogram = 5 cm

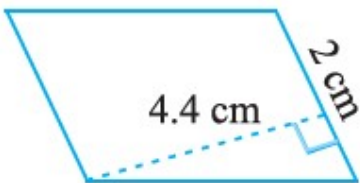
Then,

Area of parallelogram = Base $\times$ Height

$$= 5 \times 4.8$$

$$= 24 \text{ cm}^2$$

(e)



Solution:-

From the figure,

Height of parallelogram = 4.4 cm

Base of parallelogram = 2 cm

Then,

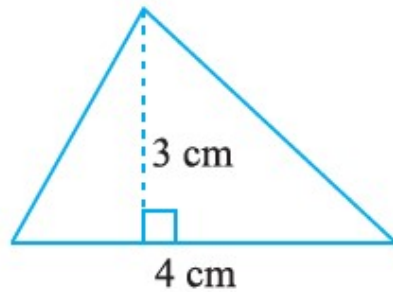
Area of parallelogram = Base $\times$ Height

$$= 2 \times 4.4$$

$$= 8.8 \text{ cm}^2$$

10. Find the area of each of the following triangles.

(a)



Solution:-

From the figure,

Base of triangle = 4 cm

Height of height = 3 cm

Then,

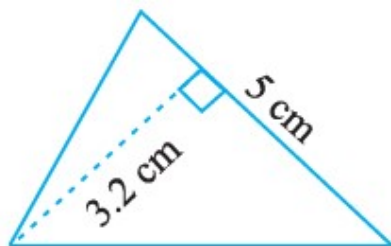
Area of triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$

$$= \frac{1}{2} \times 4 \times 3$$

$$= 1 \times 2 \times 3$$

$$= 6 \text{ cm}^2$$

(b)



Solution:-

From the figure,

Base of triangle = 3.2 cm

Height of height = 5 cm

Then,

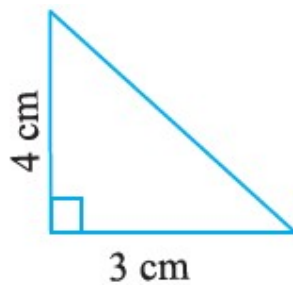
Area of triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$

$$= \frac{1}{2} \times 3.2 \times 5$$

$$= 1 \times 1.6 \times 5$$

$$= 8 \text{ cm}^2$$

(c)



Solution:-

From the figure,

Base of triangle = 3 cm

Height of height = 4 cm

Then,

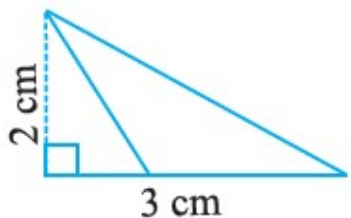
Area of triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$

$$= \frac{1}{2} \times 3 \times 4$$

$$= 1 \times 3 \times 2$$

$$= 6 \text{ cm}^2$$

(d)



Solution:-

From the figure,

Base of triangle = 3 cm

Height of height = 2 cm

Then,

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

$$= \frac{1}{2} \times 3 \times 2$$

$$= 1 \times 3 \times 1$$

$$= 3 \text{ cm}^2$$

11. Find the missing values.

S.No.	Base	Height	Area of the Parallelogram
a.	20 cm		246 cm ²
b.		15 cm	154.5 cm ²
c.		8.4 cm	48.72 cm ²
d.	15.6 cm		16.38 cm ²

Solution:-

(a)

From the table,

Base of parallelogram = 20 cm

Height of parallelogram =?

Area of the parallelogram = 246 cm^2

Then,

Area of parallelogram = Base $\times$ Height

$$246 = 20 \times \text{height}$$

$$\text{Height} = 246/20$$

$$\text{Height} = 12.3 \text{ cm}$$

$\therefore$ Height of the parallelogram is 12.3 cm.

(b)

From the table,

Base of parallelogram =?

Height of parallelogram = 15 cm

Area of the parallelogram = 154.5 cm^2

Then,

Area of parallelogram = Base $\times$ Height

$$154.5 = \text{base} \times 15$$

$$\text{Base} = 154.5/15$$

$$\text{Base} = 10.3 \text{ cm}$$

$\therefore$ Base of the parallelogram is 10.3 cm.

(c)

From the table,

Base of parallelogram =?

Height of parallelogram = 8.4 cm

Area of the parallelogram = 48.72 cm^2

Then,

Area of parallelogram = Base $\times$ Height

$$48.72 = \text{base} \times 8.4$$

$$\text{Base} = 48.72/8.4$$

$$\text{Base} = 5.8 \text{ cm}$$

$\therefore$ Base of the parallelogram is 5.8 cm.

(d)

From the table,

Base of parallelogram = 15.6 cm

Height of parallelogram = ?

Area of the parallelogram = 16.38 cm^2

Then,

Area of parallelogram = Base $\times$ Height

$$16.38 = 15.6 \times \text{height}$$

$$\text{Height} = 16.38/15.6$$

$$\text{Height} = 1.05 \text{ cm}$$

$\therefore$ Height of the parallelogram is 1.05 cm.

S.No.	Base	Height	Area of the Parallelogram
a.	20 cm	12.3 cm	246 cm^2
b.	10.3 cm	15 cm	154.5 cm^2
c.	5.8 cm	8.4 cm	48.72 cm^2
d.	15.6 cm	1.05	16.38 cm^2

12. Find the missing values.

Base	Height	Area of Triangle
15 cm		87 cm ²
	31.4 mm	1256 mm ²
22 cm		170.5 cm ²

Solution:-

(a)

From the table,

Height of triangle =?

Base of triangle = 15 cm

Area of the triangle = 16.38 cm²

Then,

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

$$87 = \frac{1}{2} \times 15 \times \text{height}$$

$$\text{Height} = (87 \times 2)/15$$

$$\text{Height} = 174/15$$

$$\text{Height} = 11.6 \text{ cm}$$

$\therefore$ Height of the triangle is 11.6 cm.

(b)

From the table,

Height of triangle = 31.4 mm

Base of triangle =?

Area of the triangle = 1256 mm²

Then,

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

$$1256 = \frac{1}{2} \times \text{base} \times 31.4$$

$$\text{Base} = (1256 \times 2)/31.4$$

$$\text{Base} = 2512/31.4$$

$$\text{Base} = 80 \text{ mm} = 8 \text{ cm}$$

$\therefore$ Base of the triangle is 80 mm or 8 cm.

(c)

From the table,

$$\text{Height of triangle} = ?$$

$$\text{Base of triangle} = 22 \text{ cm}$$

$$\text{Area of the triangle} = 170.5 \text{ cm}^2$$

Then,

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

$$170.5 = \frac{1}{2} \times 22 \times \text{height}$$

$$170.5 = 1 \times 11 \times \text{height}$$

$$\text{Height} = 170.5/11$$

$$\text{Height} = 15.5 \text{ cm}$$

$\therefore$ Height of the triangle is 15.5 cm.