

# CHAPTER-11

## Perimeter and Area

### Ex 11.1:-

#### Question 1

The length and the 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 m<sup>2</sup> of the land costs ₹ 10,000

**Solution:**

Given:  $l = 500$  m,  $b = 300$  m

(i)  $\text{Area} = l \times b$

$$= 500 \text{ m} \times 300 \text{ m} = 150000 \text{ m}^2$$

(ii)  $\text{Cost of land} = ₹ 10,000 \times 150000 = ₹ 15,00,000,000$

#### Question 2

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

**Solution:**

Given: Perimeter = 320 m

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

$$= \frac{320 \text{ m}}{4} = 80 \text{ m}$$

Area of the square = Side  $\times$  Side

$$= 80 \text{ m} \times 80 \text{ m} = 6400 \text{ m}^2$$

#### Question 3

Find the breadth of a rectangular plot of land, if its area is 440 m<sup>2</sup> and the length is 22 m. Also, find its perimeter.

**Solution:**

Given: Area = 440 m<sup>2</sup>

Length = 22 m

$$\text{Breadth} = \frac{\text{Area}}{\text{Length}} = \frac{440 \text{ m}^2}{22 \text{ m}} = 20 \text{ m}$$

$$\text{Perimeter} = 2[l + b] = 2 [22 \text{ m} + 20 \text{ m}]$$

$$= 2 \times 42 \text{ m} = 84 \text{ m}$$

#### Question 4

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

**Solution:**

Given: Perimeter = 100 cm

Length = 35 cm

$$\text{Perimeter} = 2(l + b)$$

$$100 = 2(35 + b)$$

$$100 = 70 + 2b$$

$$\Rightarrow 30 = 2b$$

$$\Rightarrow b = 50 - 35 = 15 \text{ cm}$$

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

$$\text{Area} = l \times b = 35 \text{ cm} \times 15 \text{ cm}$$

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

### Question 5

The area of a square park is same as 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:**

Given: Side of the square park = 60 m Length of the rectangular park = 90 m Area of the rectangular park = Area of the square park

$$90 \text{ m} \times b = 60 \text{ m} \times 60 \text{ m}$$

$$\Rightarrow b = \frac{60 \text{ m} \times 60 \text{ m}}{90}$$

$$\Rightarrow b = 40 \text{ m}$$

Hence, the required breadth = 40 m.

### Question 6

A wire is in the shape of a rectangle. Its length is 40 cm and 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:**

Given: Length = 40 cm, Breadth = 22 cm Perimeter of the rectangle

= Length of the wire

$$= 2(l + b) = 2(40 \text{ cm} + 22 \text{ cm})$$

$$= 2 \times 62 \text{ cm} = 124 \text{ cm}$$

Now, the wire is rebent into a square.

Perimeter = 124 cm

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

$$\therefore \text{side} = \frac{124 \text{ cm}}{4} = 31 \text{ cm}$$

So, the measure of each side = 31 cm

Area of rectangular shape =  $l \times b$

$$= 40 \text{ cm} \times 22 \text{ cm}$$

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

Area of square shape =  $(\text{Side})^2$

$$= (31)^2 = 961 \text{ cm}^2$$

$$\text{Since } 961 \text{ cm}^2 > 880 \text{ cm}^2$$

Hence, the square encloses more area.

### Question 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:**

Given: Perimeter = 130 cm

Breadth = 30 cm

Perimeter =  $2(l + b)$

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

$$\Rightarrow 130 \text{ cm} = l + 30 \text{ cm}$$

$$\Rightarrow 65 \text{ cm} = l + 30 \text{ cm}$$

$$\Rightarrow 65 \text{ cm} - 30 \text{ cm} = l$$

$$\therefore l = 35 \text{ cm}$$

Area of the rectangle =  $l \times b = 35 \text{ cm} \times 30 \text{ cm}$   
 $= 1050 \text{ cm}^2$

**Question 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. Find the cost of white washing the wall, if the rate of white washing the wall is ₹ 20 per  $\text{m}^2$ .

**Solution:**

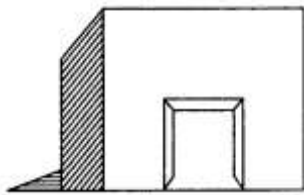
Given: Length of wall = 4.5 m

Breadth of the wall = 3.6 m

Length of the door = 2 m

Breadth of the door = 1 m

Area of the wall =  $l \times b = 4.5 \text{ m} \times 3.6 \text{ m} = 16.20 \text{ m}^2$   
 $= 16.20 \text{ m}^2$



Area of the door =  $l \times b = 2 \text{ m} \times 1 \text{ m} = 2 \text{ m}^2$

$\therefore$  Area of the wall to be white washed = Area of the wall – Area of the door  
 $= 16.20 \text{ m}^2 - 2 \text{ m}^2 = 14.20 \text{ m}^2$

Cost of white washing

$= ₹ 14.20 \times 20 = ₹ 284.00$

Hence, the required area =  $14.20 \text{ m}^2$  and the required cost = ₹ 284

**Question 1:**

The length and the 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 m<sup>2</sup> of the land costs Rs 10,000.

Answer:

$$(i) \text{ Area} = \text{Length} \times \text{Breadth}$$

$$= 500 \times 300$$

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

$$(ii) \text{ Cost of } 1 \text{ m}^2 \text{ land} = \text{Rs } 10000$$

$$\text{Cost of } 150000 \text{ m}^2 \text{ land} = 10000 \times 150000 = \text{Rs } 1500000000$$

**Question 2:**

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

Answer:

$$\text{Perimeter} = 320 \text{ m}$$

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

$$\text{Length of the side of park} = \frac{320}{4} = 80 \text{ m}$$

$$\text{Area} = (\text{Length of the side of park})^2 = (80)^2 = 6400 \text{ m}^2$$

**Question 3:**

Find the breadth of a rectangular plot of land, if its area is 440 m<sup>2</sup> and the length is 22 m. Also find its perimeter.

Answer:

$$\text{Area} = \text{Length} \times \text{Breadth} = 440 \text{ m}^2$$

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

$$\text{Breadth} = \frac{440}{22} = 20 \text{ m}$$

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

$$= 2 (22 + 20) = 2 (42) = 84 \text{ m}^2$$

**Question 4:**

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

Answer:

$$\text{Perimeter} = 2 (\text{Length} + \text{Breadth}) = 100 \text{ cm}$$

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

$$35 + B = 50$$

$$B = 50 - 35 = 15 \text{ cm}$$

$$\text{Area} = \text{Length} \times \text{Breadth} = 35 \times 15 = 525 \text{ cm}^2$$

**Question 5:**

The area of a square park is the same as 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.

Answer:

$$\text{Area of square park} = (\text{One of its sides})^2 = (60)^2 = 3600 \text{ m}^2$$

$$\text{Area of rectangular park} = \text{Length} \times \text{Breadth} = 3600$$

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

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

**Question 6:**

A wire is in the shape of a rectangle. Its length is 40 cm and 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?

Answer:

$$\text{Perimeter of rectangle} = \text{Perimeter of square}$$

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

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

$$2 \times 62 = 4 \times \text{Side}$$

$$\text{Side} = \frac{124}{4} = 31 \text{ cm}$$

$$\text{Area of rectangle} = 40 \times 22 = 880 \text{ cm}^2$$

$$\text{Area of square} = (\text{Side})^2 = 31 \times 31 = 961 \text{ cm}^2$$

Therefore, the square-shaped wire encloses more area.

**Question 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.

Answer:

$$\text{Perimeter} = 2 (\text{Length} + \text{Breadth}) = 130$$

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

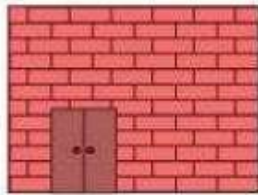
$$\text{Length} + 30 = 65$$

$$\text{Length} = 65 - 30 = 35 \text{ cm}$$

$$\text{Area} = \text{Length} \times \text{Breadth} = 35 \times 30 = 1050 \text{ cm}^2$$

**Question 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 (see the given figure). Find the cost of white washing the wall, if the rate of white washing the wall is Rs 20 per  $\text{m}^2$ .



Answer:

$$\text{Area of wall} = 4.5 \times 3.6 = 16.2 \text{ m}^2$$

$$\text{Area of door} = 2 \times 1 = 2 \text{ m}^2$$

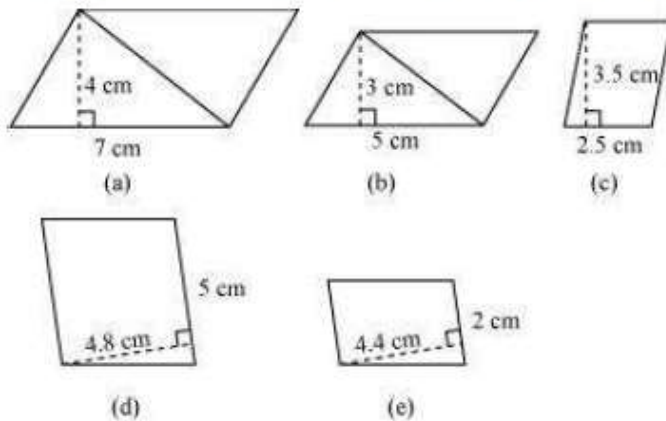
$$\text{Area to be white-washed} = 16.2 - 2 = 14.2 \text{ m}^2$$

$$\text{Cost of white-washing } 1 \text{ m}^2 \text{ area} = \text{Rs } 20$$

$$\therefore \text{Cost of white-washing } 14.2 \text{ m}^2 \text{ area} = 14.2 \times 20 = \text{Rs } 284$$

**Question 1:**

Find the area of each of the following parallelograms:



Answer:

Area of parallelogram = Base  $\times$  Height

(a) Height= 4 cm

Base = 7 cm

Area of parallelogram =  $7 \times 4 = 28 \text{ cm}^2$

(b) Height= 3 cm

Base = 5 cm

Area of parallelogram =  $5 \times 3 = 15 \text{ cm}^2$

(c) Height= 3.5 cm

Base = 2.5 cm

Area of parallelogram =  $2.5 \times 3.5 = 8.75 \text{ cm}^2$

(d) Height= 4.8 cm

Base = 5 cm

Area of parallelogram =  $5 \times 4.8 = 24 \text{ cm}^2$

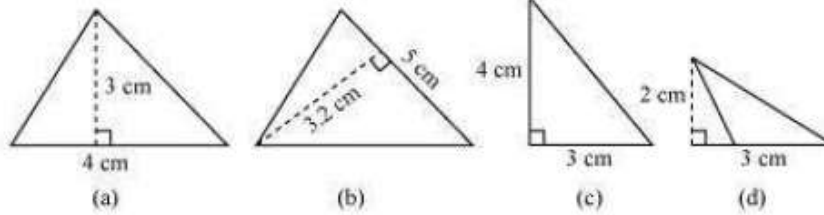
(e) Height= 4.4 cm

Base = 2 cm

Area of parallelogram =  $2 \times 4.4 = 8.8 \text{ cm}^2$

**Question 2:**

Find the area of each of the following triangles:



Answer:

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

(a) Base = 4 cm, height = 3 cm

$$\text{Area} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

(b) Base = 5 cm, height = 3.2 cm

$$\text{Area} = \frac{1}{2} \times 5 \times 3.2 = 8 \text{ cm}^2$$

(c) Base = 4 cm, height = 3 cm

$$\text{Area} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

(d) Base = 3 cm, height = 2 cm

$$\text{Area} = \frac{1}{2} \times 2 \times 3 = 3 \text{ cm}^2$$

### Question 3:

Find the missing values:

So No	Base	Height	Area of parallelogram
a.	20 cm	-	246 cm <sup>2</sup>
b.	-	15 cm	154.5 cm <sup>2</sup>
c.	-	8.4 cm	48.72 cm <sup>2</sup>
d.	15.6 cm	-	16.38 cm <sup>2</sup>

Answer:

$$\text{Area of parallelogram} = \text{Base} \times \text{Height}$$



(a)  $b = 20 \text{ cm}$

$h = ?$

Area =  $246 \text{ cm}^2$

$20 \times h = 246$

$h = \frac{246}{20} = 12.3 \text{ cm}$

Therefore, the height of such parallelogram is 12.3 cm.

(b)  $b = ?$

$h = 15 \text{ cm}$

Area =  $154.5 \text{ cm}^2$

$b \times 15 = 154.5$

$b = 10.3 \text{ cm}$

Therefore, the base of such parallelogram is 10.3 cm.

(c)  $b = ?$

$h = 8.4 \text{ cm}$

Area =  $48.72 \text{ cm}^2$

$b \times 8.4 = 48.72$

$b = \frac{48.72}{8.4} = 5.8 \text{ cm}$

Therefore, the base of such parallelogram is 5.8 cm.

(d)  $b = 15.6 \text{ cm}$

$h = ?$

Area =  $16.38 \text{ cm}^2$

$15.6 \times h = 16.38$

$h = \frac{16.38}{15.6} = 1.05 \text{ cm}$

Therefore, the height of such parallelogram is 1.05 cm.

**Question 4:**

Find the missing values:

Base	Height	Area of triangle
15 cm	_____	$87 \text{ cm}^2$

_____	31.4 mm	1256 mm <sup>2</sup>
22 cm	_____	170.5 cm <sup>2</sup>

Answer:

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

(a)  $b = 15 \text{ cm}$

$h = ?$

$$\text{Area} = \frac{1}{2} \times b \times h = 87 \text{ cm}^2$$

$$\frac{1}{2} \times 15 \times h = 87 \text{ cm}^2$$

$$h = \frac{87 \times 2}{15} = 11.6 \text{ cm}$$

Therefore, the height of such triangle is 11.6 cm.

(b)  $b = ?$

$h = 31.4 \text{ mm}$

$$\text{Area} = \frac{1}{2} \times b \times h = 1256 \text{ mm}^2$$

$$\frac{1}{2} \times b \times 31.4 = 1256$$

$$b = \frac{1256 \times 2}{31.4} = 80 \text{ mm}$$

Therefore, the base of such triangle is 80 mm.

(c)  $b = 22 \text{ cm}$

$h = ?$

$$\text{Area} = \frac{1}{2} \times b \times h = 170.5 \text{ cm}^2$$

$$\frac{1}{2} \times 22 \times h = 170.5 \text{ cm}^2$$

$$h = \frac{170.5 \times 2}{22} = 15.5 \text{ cm}$$

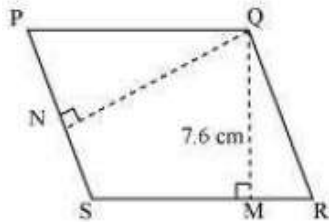
Therefore, the height of such triangle is 15.5 cm.

**Question 5:**

PQRS is a parallelogram (see the given figure). QM is the height from Q to SR and QN is the height from Q to PS. If SR = 12 cm and QM = 7.6 cm. Find:

(a) the area of the parallelogram PQRS

(b) QN, if PS = 8 cm



Answer:

(a) Area of parallelogram = Base  $\times$  Height = SR  $\times$  QM

$$= 7.6 \times 12 = 91.2 \text{ cm}^2$$

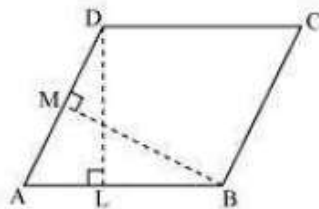
(b) Area of parallelogram = Base  $\times$  Height = PS  $\times$  QN =  $91.2 \text{ cm}^2$

$$\text{QN} \times 8 = 91.2$$

$$\text{QN} = \frac{91.2}{8} = 11.4 \text{ cm}$$

**Question 6:**

DL and BM are the heights on sides AB and AD respectively of parallelogram ABCD (see the given figure). If the area of the parallelogram is  $1470 \text{ cm}^2$ , AB = 35 cm and AD = 49 cm, find the length of BM and DL.



Answer:

Area of parallelogram = Base  $\times$  Height = AB  $\times$  DL

$$1470 = 35 \times \text{DL}$$

$$\text{DL} = \frac{1470}{35} = 42 \text{ cm}$$

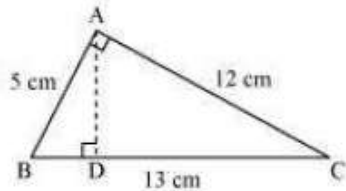
Also,  $1470 = \text{AD} \times \text{BM}$

$$1470 = 49 \times \text{BM}$$

$$BM = \frac{1470}{49} = 30 \text{ cm}$$

**Question 7:**

$\triangle ABC$  is right angled at A (see the given figure). AD is perpendicular to BC. If AB = 5 cm, BC = 13 cm and AC = 12 cm, Find the area of  $\triangle ABC$ . Also find the length of AD.



Answer:

$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$$

$$\text{Also, area of triangle} = \frac{1}{2} \times AD \times BC$$

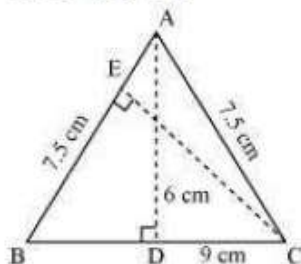
$$30 = \frac{1}{2} \times AD \times 13$$

$$\frac{30 \times 2}{13} = AD$$

$$AD = 4.6 \text{ cm}$$

**Question 8:**

$\triangle ABC$  is isosceles with AB = AC = 7.5 cm and BC = 9 cm (see the given figure). The height AD from A to BC, is 6 cm. Find the area of  $\triangle ABC$ . What will be the height from C to AB i.e., CE?



Answer:

$$\begin{aligned}\text{Area of } \triangle ABC &= \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times BC \times AD \\ &= \frac{1}{2} \times 9 \times 6 = 27 \text{ cm}^2\end{aligned}$$

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

$$27 = \frac{1}{2} \times 7.5 \times CE$$

$$CE = 7.2 \text{ cm}$$

**Question 1:**

Find the circumference of the circles with the following radius: (Taken  $= \frac{22}{7}$  )

(a) 14 cm (b) 28 mm (c) 21 cm

Answer:

(a)  $r = 14$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 14 = 88 \text{ cm}$$

(b)  $r = 28$  mm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 28 = 176 \text{ mm}$$

(c)  $r = 21$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 21 = 132 \text{ cm}$$

**Question 2:**

Find the area of the following circles, given that:

(a) radius = 14 mm (Taken  $= \frac{22}{7}$  ) (b) diameter = 49 m

(c) radius = 5 cm

Answer:

(a)  $r = 14$  mm

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 14 \times 14 = 616 \text{ mm}^2$$

(b)  $d = 49$  m

$$r = \frac{49}{2} \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

(c)  $r = 5$  cm

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 5 \times 5 = \frac{550}{7} = 78.57 \text{ cm}^2$$

**Question 3:**

If the circumference of a circular sheet is 154m, find its radius. Also find the area of the sheet. (Taken  $= \frac{22}{7}$ )

Answer:

$$\text{Circumference} = 2\pi r = 154 \text{ m}$$

$$2 \times \frac{22}{7} \times r = 154$$

$$r = 154 \times \frac{7}{44} = \frac{49}{2} = 24.5 \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times r^2$$

$$= \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

**Question 4:**

A gardener wants to fence a circular garden of diameter 21 m. Find the length of the rope he needs to purchase, if he makes 2 rounds of fence. Also find the costs of the

rope, if it cost Rs 4 per meter. (Taken  $= \frac{22}{7}$ )

Answer:

$$d = 21 \text{ m}$$

$$r = \frac{21}{2} \text{ m}$$

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times \frac{21}{2} = 66 \text{ m}$$

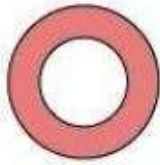
$$\text{Length of rope required for fencing} = 2 \times 66 \text{ m} = 132 \text{ m}$$

$$\text{Cost of 1 m rope} = \text{Rs } 4$$

$$\text{Cost of 132 m rope} = 4 \times 132 = \text{Rs } 528$$

**Question 5:**

From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Taken = 3.14)



Answer:

Outer radius of circular sheet = 4 cm

Inner radius of circular sheet = 3 cm

Remaining area =  $3.14 \times 4 \times 4 - 3.14 \times 3 \times 3$

=  $50.24 - 28.26$

=  $21.98 \text{ cm}^2$

**Question 6:**

Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one meter of the lace costs Rs 15. (

Taken = 3.14)

Answer:

Circumference =  $2\pi r$

$$= 2 \times 3.14 \times \frac{d}{2}$$

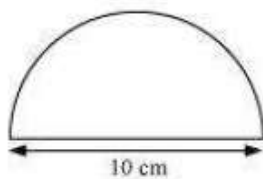
$$= 2 \times 3.14 \times \frac{1.5}{2} = 4.71 \text{ m}$$

Cost of 1 m lace = Rs 15

Cost of 4.71 m lace =  $4.71 \times 15 = \text{Rs } 70.65$

**Question 7:**

Find the perimeter of the adjoining figure, which is a semicircle including its diameter.



Answer:

Radius = 5 cm

Length of curved part =  $\pi r$

$$= \frac{22}{7} \times 5$$



$$= 15.71 \text{ cm}$$

Total perimeter = Length of curved part + Length of diameter

$$= 15.71 + 10 = 25.71 \text{ cm}$$

**Question 8:**

Find the cost of polishing a circular table-top of diameter 1.6 m, if the rate of polishing is Rs 15/m<sup>2</sup>. (Take  $\pi = 3.14$ )

Answer:

$$\text{Diameter} = 1.6 \text{ m}$$

$$\text{Radius} = \frac{1.6}{2} = 0.8 \text{ m}$$

$$\text{Area} = 3.14 \times 0.8 \times 0.8$$

$$= 2.0096 \text{ m}^2$$

Cost for polishing 1 m<sup>2</sup> area = Rs 15

$$\text{Cost for polishing } 2.0096 \text{ m}^2 \text{ area} = 15 \times 2.0096 = 30.14$$

Therefore, it will cost Rs 30.14 for polishing such circular table.

**Question 9:**

Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the

square? (Taken  $\pi = \frac{22}{7}$ )

Answer:

$$\text{Circumference} = 2\pi r = 44 \text{ cm}$$

$$2 \times \frac{22}{7} \times r = 44$$

$$r = 7 \text{ cm}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

If the wire is bent into a square, then the length of each side would be  $= \frac{44}{4} = 11 \text{ cm}$

$$\text{Area of square} = (11)^2 = 121 \text{ cm}^2$$

Therefore, circle encloses more area.

**Question 10:**

From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed (as shown in the following figure). Find

the area of the remaining sheet. (Taken  $= \frac{22}{7}$  )



Answer:

$$\text{Area of bigger circle} = \frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$$

$$\text{Area of 2 small circles} = 2 \times \pi r^2 = 2 \times \frac{22}{7} \times 3.5 \times 3.5 = 77 \text{ cm}^2$$

$$\text{Area of rectangle} = \text{Length} \times \text{Breadth} = 3 \times 1 = 3 \text{ cm}^2$$

$$\text{Remaining area of sheet} = 616 - 77 - 3 = 536 \text{ cm}^2$$

**Question 11:**

A circle of radius 2 cm is cut out from a square piece of an aluminium sheet of side 6 cm. What is the area of the left over aluminium sheet? (Take  $\pi = 3.14$ )

Answer:

$$\text{Area of square-shaped sheet} = (\text{Side})^2 = (6)^2 = 36 \text{ cm}^2$$

$$\text{Area of circle} = 3.14 \times 2 \times 2 = 12.56 \text{ cm}^2$$

$$\text{Remaining area of sheet} = 36 - 12.56 = 23.44 \text{ cm}^2$$

**Question 12:**

The circumference of a circle is 31.4 cm. Find the radius and the area of the circle? (Take  $\pi = 3.14$ )

Answer:

$$\text{Circumference} = 2\pi r = 31.4 \text{ cm}$$

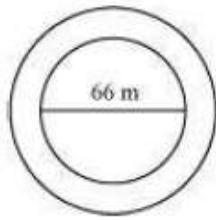
$$2 \times 3.14 \times r = 31.4$$

$$r = 5 \text{ cm}$$

$$\text{Area} = 3.14 \times 5 \times 5 = 78.50 \text{ cm}^2$$

**Question 13:**

A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? ( $\pi = 3.14$ )



Answer:

$$\text{Radius of flower bed} = \frac{66}{2} = 33 \text{ m}$$

$$\text{Radius of flower bed and path together} = 33 + 4 = 37 \text{ m}$$

$$\text{Area of flower bed and path together} = 3.14 \times 37 \times 37 = 4298.66 \text{ m}^2$$

$$\text{Area of flower bed} = 3.14 \times 33 \times 33 = 3419.46 \text{ m}^2$$

$$\begin{aligned} \text{Area of path} &= \text{Area of flower bed and path together} - \text{Area of flower bed} \\ &= 4298.66 - 3419.46 = 879.20 \text{ m}^2 \end{aligned}$$

**Question 14:**

A circular flower garden has an area of  $314 \text{ m}^2$ . A sprinkler at the centre of the garden can cover an area that has a radius of 12 m. Will the sprinkler water the entire garden? (Take  $\pi = 3.14$ )

Answer:

$$\text{Area} = \pi r^2 = 314 \text{ m}^2$$

$$3.14 \times r^2 = 314$$

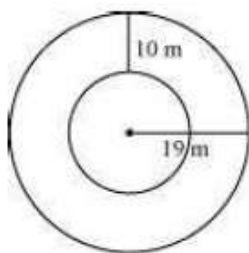
$$r^2 = 100$$

$$r = 10 \text{ m}$$

Yes, the sprinkler will water the whole garden.

**Question 15:**

Find the circumference of the inner and the outer circles, shown in the adjoining figure? (Take  $\pi = 3.14$ )



Answer:

Radius of outer circle = 19 m

Circumference =  $2\pi r = 2 \times 3.14 \times 19 = 119.32$  m

Radius of inner circle =  $19 - 10 = 9$  m

Circumference =  $2\pi r = 2 \times 3.14 \times 9 = 56.52$  m

**Question 16:**

How many times a wheel of radius 28 cm must rotate to go 352 m?

(Take  $n = \frac{22}{7}$ )

Answer:

$r = 28$  cm

Circumference =  $2\pi r = 2 \times \frac{22}{7} \times 28 = 176$  cm

Number of rotations =  $\frac{\text{Total distance to be covered}}{\text{Circumference of wheel}} = \frac{352\text{m}}{176\text{cm}} = \frac{35200}{176} = 200$

Therefore, it will rotate 200 times.

**Question 17:**

The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour. (Take  $n = 3.14$ )

Answer:

Distance travelled by the tip of minute hand = Circumference of the clock

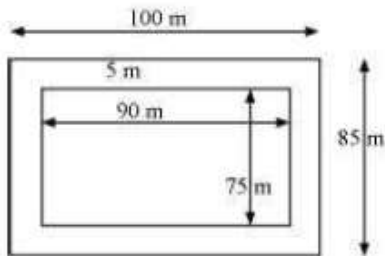
$= 2\pi r = 2 \times 3.14 \times 15$

$= 94.2$  cm

**Question 1:**

A garden is 90 m long and 75 m broad. A path 5 m wide is to be built outside and around it. Find the area of the path. Also find the area of the garden in hectare.

Answer:



Length ( $l$ ) of garden = 90 m

Breadth ( $b$ ) of garden = 75 m

Area of garden =  $l \times b = 90 \times 75 = 6750 \text{ m}^2$

From the figure, it can be observed that the new length and breadth of the garden, when path is also included, are 100m and 85m respectively.

Area of the garden including the path =  $100 \times 85 = 8500 \text{ m}^2$

Area of path = Area of the garden including the path – Area of garden  
 $= 8500 - 6750 = 1750 \text{ m}^2$

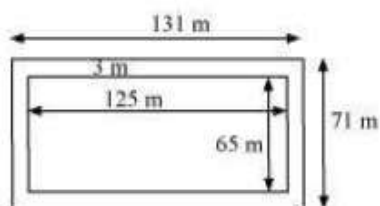
1 hectare =  $10000 \text{ m}^2$

Therefore, area of garden in hectare =  $\frac{6750}{10000} = 0.675 \text{ hectare}$

**Question 2:**

A 3 m wide path runs outside and around a rectangular park of length 125 m and breadth 65 m. Find the area of the path.

Answer:



Length ( $l$ ) of park = 125 m

Breadth ( $b$ ) of park = 65 m

Area of park =  $l \times b = 125 \times 65 = 8125 \text{ m}^2$



From the figure, it can be observed that the new length and breadth of the park, when path is also included, are 131 m and 71 m respectively.

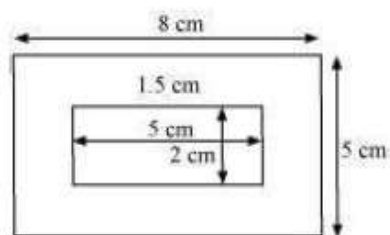
$$\text{Area of the park including the path} = 131 \times 71 = 9301 \text{ m}^2$$

$$\begin{aligned}\text{Area of path} &= \text{Area of the park including the path} - \text{Area of park} \\ &= 9301 - 8125 = 1176 \text{ m}^2\end{aligned}$$

**Question 3:**

A picture is painted on a cardboard 8 cm long and 5 cm wide such that there is a margin of 1.5 cm along each of its sides. Find the total area of the margin.

Answer:



$$\text{Length } (l) \text{ of cardboard} = 8 \text{ cm}$$

$$\text{Breadth } (b) \text{ of cardboard} = 5 \text{ cm}$$

$$\text{Area of cardboard including margin} = l \times b = 8 \times 5 = 40 \text{ cm}^2$$

From the figure, it can be observed that the new length and breadth of the cardboard, when margin is not included, are 5 cm and 2 cm respectively.

$$\text{Area of the cardboard not including the margin} = 5 \times 2 = 10 \text{ cm}^2$$

$$\begin{aligned}\text{Area of the margin} &= \text{Area of cardboard including the margin} - \text{Area of cardboard not including the margin} \\ &= 40 - 10 = 30 \text{ cm}^2\end{aligned}$$

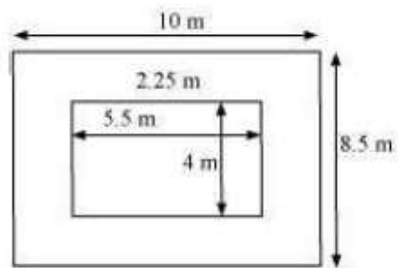
**Question 4:**

A verandah of width 2.25 m is constructed all along outside a room which is 5.5 m long and 4 m wide. Find:

(i) the area of the verandah

(ii) the cost of cementing the floor of the verandah at the rate of Rs 200 per  $\text{m}^2$ .

Answer:



(i)

Length ( $l$ ) of room = 5.5 m

Breadth ( $b$ ) of room = 4 m

Area of room =  $l \times b = 5.5 \times 4 = 22 \text{ m}^2$

From the figure, it can be observed that the new length and breadth of the room, when verandah is also included, are 10 m and 8.5 m respectively.

Area of the room including the verandah =  $10 \times 8.5 = 85 \text{ m}^2$

Area of verandah = Area of the room including the verandah – Area of room  
 $= 85 - 22 = 63 \text{ m}^2$

(ii)

Cost of cementing  $1 \text{ m}^2$  area of the floor of the verandah = Rs 200

Cost of cementing  $63 \text{ m}^2$  area of the floor of the verandah =  $200 \times 63$   
 $= \text{Rs } 12600$

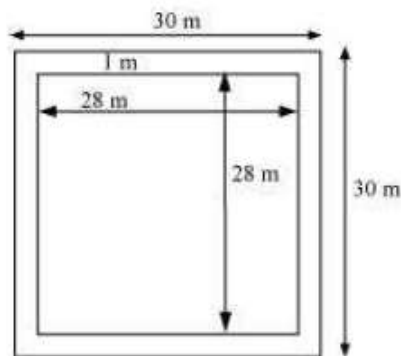
#### Question 5:

A path 1 m wide is built along the border and inside a square garden of side 30 m. Find:

(i) the area of the path

(ii) the cost of planting grass in the remaining portion of the garden at the rate of Rs 40 per  $\text{m}^2$ .

Answer:



(i)

Side ( $a$ ) of square garden = 30 m

Area of square garden including path =  $a^2 = (30)^2 = 900 \text{ m}^2$

From the figure, it can be observed that the side of the square garden, when path is not included, is 28 m.

Area of the square garden not including the path =  $(28)^2 = 784 \text{ m}^2$

Area of path = Area of the square garden including the path – Area of square garden not including the path

=  $900 - 784 = 116 \text{ m}^2$

(ii)

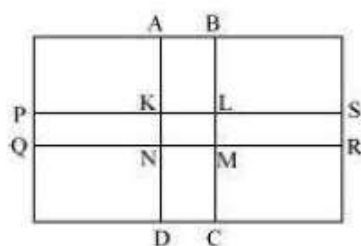
Cost of planting grass in  $1 \text{ m}^2$  area of the garden = Rs 40

Cost of planting grass in  $784 \text{ m}^2$  area of the garden =  $784 \times 40 = \text{Rs } 31360$

#### Question 6:

Two cross roads, each of width 10 m, cut at right angles through the centre of a rectangular park of length 700 m and breadth 300 m and parallel to its sides. Find the area of the roads. Also find the area of the park excluding cross roads. Give the answer in hectares.

Answer:



Length ( $l$ ) of park = 700 m

Breadth ( $b$ ) of park = 300 m



$$\text{Area of park} = 700 \times 300 = 210000 \text{ m}^2$$

$$\text{Length of road PQRS} = 700 \text{ m}$$

$$\text{Length of road ABCD} = 300 \text{ m}$$

$$\text{Width of each road} = 10 \text{ m}$$

$$\text{Area of the roads} = \text{ar (PQRS)} + \text{ar (ABCD)} - \text{ar (KLMN)}$$

$$= (700 \times 10) + (300 \times 10) - (10 \times 10)$$

$$= 7000 + 3000 - 100$$

$$= 10000 - 100 = 9900 \text{ m}^2 = 0.99 \text{ hectare}$$

$$\text{Area of park excluding roads} = 210000 - 9900 = 200100 \text{ m}^2 = 20.01 \text{ hectare}$$

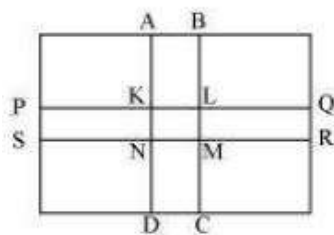
#### Question 7:

Through a rectangular field of length 90 m and breadth 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the fields. If the width of each road is 3 m, find

(i) the area covered by the roads.

(ii) the cost of constructing the roads at the rate of Rs 110 per  $\text{m}^2$ .

Answer:



$$\text{Length (l) of field} = 90 \text{ m}$$

$$\text{Breadth (b) of field} = 60 \text{ m}$$

$$\text{Area of field} = 90 \times 60 = 5400 \text{ m}^2$$

$$\text{Length of road PQRS} = 90 \text{ m}$$

$$\text{Length of road ABCD} = 60 \text{ m}$$

$$\text{Width of each road} = 3 \text{ m}$$

$$\text{Area of the roads} = \text{ar (PQRS)} + \text{ar (ABCD)} - \text{ar (KLMN)}$$

$$= (90 \times 3) + (60 \times 3) - (3 \times 3)$$

$$= 270 + 180 - 9 = 441 \text{ m}^2$$

$$\text{Cost for constructing 1 m}^2 \text{ road} = \text{Rs } 110$$

$$\text{Cost for constructing 441 m}^2 \text{ road} = 110 \times 441 = \text{Rs } 48510$$

**Question 8:**

Pragya wrapped a cord around a circular pipe of radius 4 cm (adjoining figure) and cut off the length required of the cord. Then she wrapped it around a square box of side 4 cm (also shown). Did she have any cord left? ( $\pi = 3.14$ ).



Answer:

Perimeter of the square =  $4 \times \text{Side of the square} = 4 \times 4 = 16 \text{ cm}$

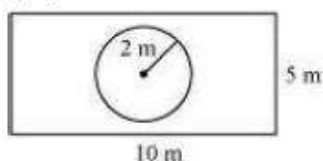
Perimeter of circular pipe =  $2\pi r = 2 \times 3.14 \times 4 = 25.12 \text{ cm}$

Length of chord left with Pragya =  $25.12 - 16 = 9.12 \text{ cm}$

**Question 9:**

The adjoining figure represents a rectangular lawn with a circular flower bed in the middle. Find:

- (i) the area of the whole land
- (ii) the area of the flower bed
- (iii) the area of the lawn excluding the area of the flower bed
- (iv) the circumference of the flower bed.



Answer:

(i) Area of whole land = Length  $\times$  Breadth =  $10 \times 5 = 50 \text{ m}^2$

(ii) Area of flower bed =  $\pi r^2 = 3.14 \times 2 \times 2 = 12.56 \text{ m}^2$

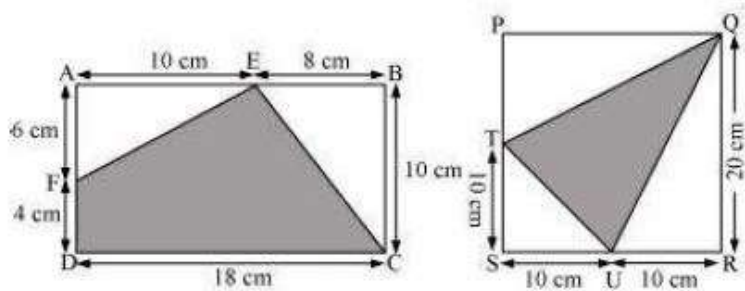
(iii) Area of lawn excluding the flower bed = Area of whole land – Area of flower bed

=  $50 - 12.56 = 37.44 \text{ m}^2$

(iv) Circumference of flower bed =  $2\pi r = 2 \times 3.14 \times 2 = 12.56 \text{ m}$

**Question 10:**

In the following figures, find the area of the shaded portions:



Answer:

(i)

Area of EFDC = ar (ABCD) – ar (BCE) – ar (AFE)

$$\begin{aligned}
 &= (18 \times 10) - \frac{1}{2} (10 \times 8) - \frac{1}{2} (6 \times 10) \\
 &= 180 - 40 - 30 = 110 \text{ cm}^2
 \end{aligned}$$

(ii)

ar (QTU) = ar (PQRS) – ar (TSU) – ar (RUQ) – ar (PQT)

$$\begin{aligned}
 &= (20 \times 20) - \frac{1}{2} (10 \times 10) - \frac{1}{2} (20 \times 10) - \frac{1}{2} (20 \times 10) \\
 &= 400 - 50 - 100 - 100 = 150 \text{ cm}^2
 \end{aligned}$$

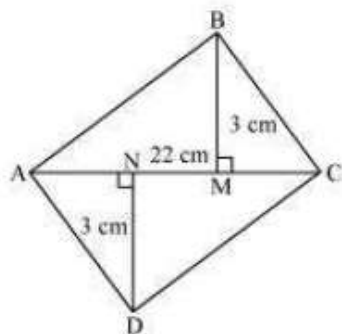
**Question 11:**

Find the area of the quadrilateral ABCD.

Here, AC = 22 cm, BM = 3 cm,

DN = 3 cm, and

BM ⊥ AC, DN ⊥ AC



Answer:

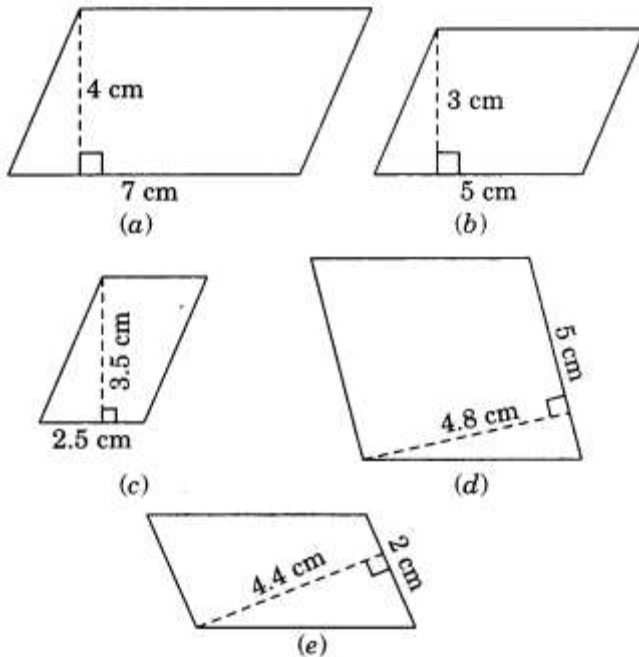
ar (ABCD) = ar (ABC) + ar (ADC)

$$\begin{aligned}
 &= \frac{1}{2} (3 \times 22) + \frac{1}{2} (3 \times 22) \\
 &= 33 + 33 = 66 \text{ cm}^2
 \end{aligned}$$

### Ex 11.2:-

#### Question 1

Find the area of each of the following parallelograms:

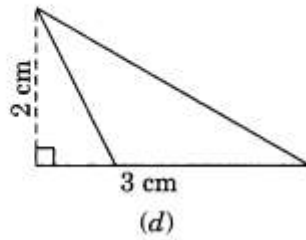
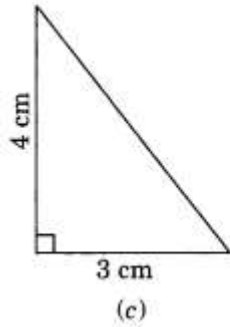
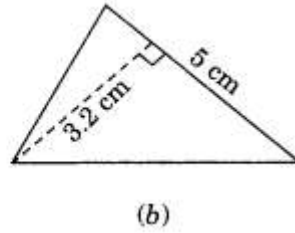
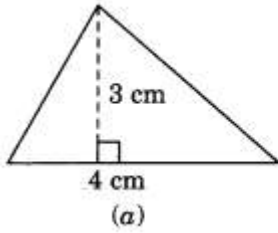


**Solution:**

- (a) Area of the parallelogram  
= base  $\times$  altitude = 7 cm  $\times$  4 cm  
= 28 cm<sup>2</sup>
- (b) Area of the parallelogram  
= base  $\times$  altitude = 5 cm  $\times$  3 cm  
= 15 cm<sup>2</sup>
- (c) Area of the parallelogram  
= base  $\times$  altitude = 2.5 cm  $\times$  3.5 cm  
= 8.75 cm<sup>2</sup>
- (d) Area of the parallelogram  
= base  $\times$  altitude = 5 cm  $\times$  4.8 cm  
= 24.0 cm<sup>2</sup>
- (e) Area of the parallelogram  
= base  $\times$  altitude = 2 cm  $\times$  4.4 cm  
= 8.8 cm<sup>2</sup>

## Question 2

Find the area of each of the following triangles:



**Solution:**

$$\begin{aligned}\text{Area of the triangle} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 4 \text{ cm} \times 3 \text{ cm} \\ &= 6 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{(b) Area of the triangle} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 5 \text{ cm} \times 3.2 \text{ cm} \\ &= 8.0 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(c) Area of the triangle} &= \frac{1}{2} \times b \times l \\ &= \frac{1}{2} \times 3 \text{ cm} \times 4 \text{ cm} \\ &= 6 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(d) Area of the triangle} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 3 \text{ cm} \times 2 \text{ cm} \\ &= 3 \text{ cm}^2\end{aligned}$$

**Question 3**

Find the missing values:

S.No.	Base	Height	Area of the parallelogram
(a)	20 cm		246 cm <sup>2</sup>
(6)		15 cm	154.5 cm <sup>2</sup>
(c)		8.4 cm	48.72 cm <sup>2</sup>
(d)	15.6		16.38 cm <sup>2</sup>

**Solution:**(a) Area of the parallelogram =  $b \times h$ 

$$246 = 20 \times h$$

$$\therefore h = \frac{246}{20} \text{ cm} = \frac{123}{10} \text{ cm} = 12.3 \text{ cm}$$

(b) Area of the parallelogram =  $b \times h$ 

$$154.5 = b \times 15$$

$$\begin{aligned} \therefore b &= \frac{154.5}{15} = \frac{309^{103}}{15 \times 10} \\ &= \frac{103}{10} \text{ cm} = 10.3 \text{ cm} \end{aligned}$$

(c) Area of the parallelogram =  $b \times h$   
 $48.72 = b \times 8.4$

$$\therefore b = \frac{48.72}{8.4} = \frac{1218 \overset{486}{\cancel{4872}}}{84 \times 10} = \frac{58}{10} \text{ cm}$$

$$= 5.8 \text{ cm}$$

(d) Area of the parallelogram =  $b \times h$   
 $16.38 = 15.6 \times h$

$$\therefore h = \frac{16.38}{15.6} = \frac{819 \overset{273}{\cancel{1638}}}{156 \times 10} \text{ cm}$$

$$= \frac{273}{260} = 1.05 \text{ cm}$$

#### Question 4

Find the missing values:

Base	Height	Area of the triangle
15 cm	—	87 cm <sup>2</sup>
—	31.4 mm	1256 mm <sup>2</sup>
22 cm	—	170.5 cm <sup>2</sup>

**Solution:**

(i) Area of the triangle =  $12 \times b \times h$

$$87 \text{ cm}^2 = \frac{1}{2} \times 15 \times h$$

$$\therefore h = \frac{87 \times 2}{15} \text{ cm}$$

$$= \frac{174}{15} \text{ cm} = 11.6 \text{ cm}$$

So, the height = 11.6 cm

(ii) Area of the triangle =  $\frac{1}{2} \times b \times h$

$$1256 \text{ mm}^2 = \frac{1}{2} \times b \times 31.4 \text{ mm}$$

$$\therefore b = \frac{1256 \times 2}{31.4} \text{ mm} = 40 \times 2 = 80 \text{ mm}$$

So, the required base = 80 mm.

(iii) Area of the triangle =  $\frac{1}{2} \times b \times h$

$$170.5 \text{ cm}^2 = \frac{1}{2} \times 22 \times h$$

$$\therefore h = \frac{170.5 \times 2}{22} = 15.5 \text{ cm}$$

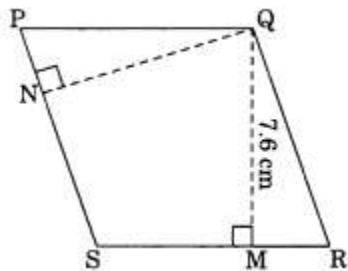
So, the required height = 15.5 cm

### Question 5

PQRS is a parallelogram. QM is the height of Q to SR and QN is the height from Q to PS. If SR = 12 cm and QM = 7.6 cm. Find:

(a) the area of the parallelogram PQRS

(b) QN, if PS = 8 cm



**Solution:**

(a) Area of the parallelogram PQRS

= SR  $\times$  QM ( $\because$  Area = Base  $\times$  Height)

= 12 cm  $\times$  7.6 cm

= 91.2 cm<sup>2</sup>



(b) Area of the parallelogram PQRS

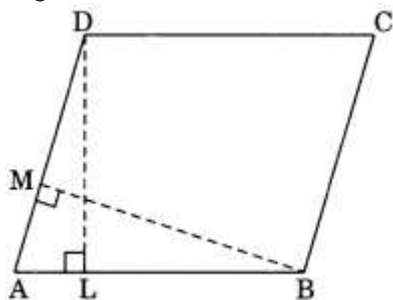
$$= \frac{1}{2} \times PS \times QN$$

$$91.2 \text{ cm}^2 = \frac{1}{2} \times 8 \text{ cm} \times QN$$

$$\Rightarrow QN = \frac{91.2 \times 2}{8} = 22.8 \text{ cm}$$

### Question 6

DL and BM are the heights on sides AB and AD respectively of parallelogram ABCD. If the area of the parallelogram is  $1470 \text{ cm}^2$ ,  $AB = 35 \text{ cm}$  and  $AD = 49 \text{ cm}$ , find the length of BM and DL.



**Solution:**

Area of the parallelogram ABCD

$$= AB \times DL$$

$$\Rightarrow 1470 \text{ cm}^2 = 35 \text{ cm} \times DL$$

$$\Rightarrow 147035 = DL$$

$$\therefore DL = 42 \text{ cm}$$

Area of the parallelogram ABCD =  $AD \times BM$

$$1470 \text{ cm}^2 = 49 \text{ cm} \times BM$$

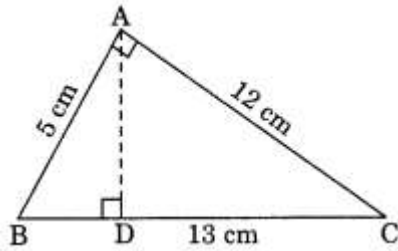
$$\Rightarrow 147049 = 30 \text{ cm}$$

$$\therefore BM = 30 \text{ cm}$$

Hence,  $BM = 30 \text{ cm}$  and  $DL = 42 \text{ cm}$

### Question 7

$\triangle ABC$  is right angled at A. AD is perpendicular to BC. If AB = 5 cm, BC = 13 cm and AC = 12 cm, find the area of  $\triangle ABC$ . Also find the length of AD.



**Solution:**

Area of right triangle ABC

$$= \frac{1}{2} \times AB \times AC = \frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$$

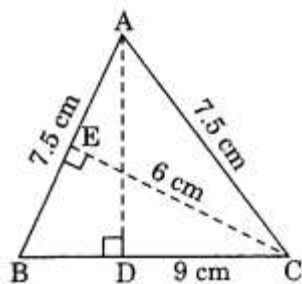
$$\text{Area of } \triangle ABC = \frac{1}{2} \times BC \times AD$$

$$30 \text{ cm}^2 = \frac{1}{2} \times 13 \text{ cm} \times AD$$

$$\begin{aligned} \therefore AD &= \frac{30 \times 2}{13} \text{ cm} \\ &= \frac{60}{13} \text{ cm} = 4.62 \text{ cm} \end{aligned}$$

### Question 8

$\triangle ABC$  is isosceles with AB = AC = 7.5 cm and BC = 9 cm. The height AD from A to BC, is 6 cm. Find the area of  $\triangle ABC$ . What will be the height from C to AB i.e., CE?



**Solution:**

Area of  $\triangle ABC = \frac{1}{2} \times \text{base} \times \text{height}$

$$= \frac{1}{2} \times 9 \text{ cm} \times 6 \text{ cm} = 27 \text{ cm}^2$$

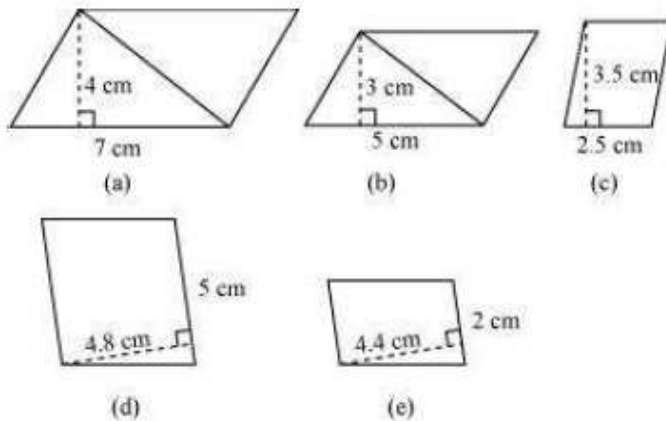
$$\text{Area of } \triangle ABC = \frac{1}{2} \times AB \times CE$$

$$27 \text{ cm}^2 = \frac{1}{2} \times 7.5 \text{ cm} \times CE$$

$$\therefore CE = \frac{27 \times 2}{7.5} \text{ cm} = \frac{36}{5} \text{ cm} = 7.2 \text{ cm}$$

**Question 1:**

Find the area of each of the following parallelograms:



Answer:

Area of parallelogram = Base  $\times$  Height

(a) Height = 4 cm

Base = 7 cm

Area of parallelogram =  $7 \times 4 = 28 \text{ cm}^2$

(b) Height = 3 cm

Base = 5 cm

Area of parallelogram =  $5 \times 3 = 15 \text{ cm}^2$

(c) Height = 3.5 cm

Base = 2.5 cm

Area of parallelogram =  $2.5 \times 3.5 = 8.75 \text{ cm}^2$

(d) Height = 4.8 cm

Base = 5 cm

Area of parallelogram =  $5 \times 4.8 = 24 \text{ cm}^2$

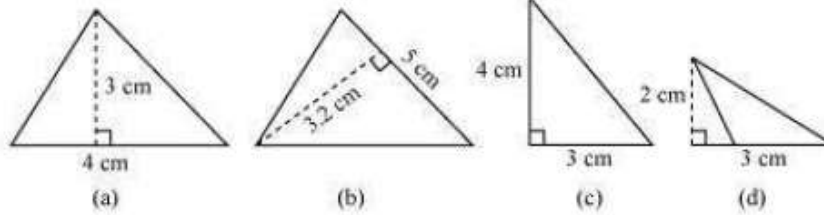
(e) Height = 4.4 cm

Base = 2 cm

Area of parallelogram =  $2 \times 4.4 = 8.8 \text{ cm}^2$

**Question 2:**

Find the area of each of the following triangles:



Answer:

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

(a) Base = 4 cm, height = 3 cm

$$\text{Area} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

(b) Base = 5 cm, height = 3.2 cm

$$\text{Area} = \frac{1}{2} \times 5 \times 3.2 = 8 \text{ cm}^2$$

(c) Base = 4 cm, height = 3 cm

$$\text{Area} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

(d) Base = 3 cm, height = 2 cm

$$\text{Area} = \frac{1}{2} \times 2 \times 3 = 3 \text{ cm}^2$$

### Question 3:

Find the missing values:

So No	Base	Height	Area of parallelogram
a.	20 cm	-	246 cm <sup>2</sup>
b.	-	15 cm	154.5 cm <sup>2</sup>
c.	-	8.4 cm	48.72 cm <sup>2</sup>
d.	15.6 cm	-	16.38 cm <sup>2</sup>

Answer:

$$\text{Area of parallelogram} = \text{Base} \times \text{Height}$$

(a)  $b = 20 \text{ cm}$

$h = ?$

Area =  $246 \text{ cm}^2$

$20 \times h = 246$

$h = \frac{246}{20} = 12.3 \text{ cm}$

Therefore, the height of such parallelogram is 12.3 cm.

(b)  $b = ?$

$h = 15 \text{ cm}$

Area =  $154.5 \text{ cm}^2$

$b \times 15 = 154.5$

$b = 10.3 \text{ cm}$

Therefore, the base of such parallelogram is 10.3 cm.

(c)  $b = ?$

$h = 8.4 \text{ cm}$

Area =  $48.72 \text{ cm}^2$

$b \times 8.4 = 48.72$

$b = \frac{48.72}{8.4} = 5.8 \text{ cm}$

Therefore, the base of such parallelogram is 5.8 cm.

(d)  $b = 15.6 \text{ cm}$

$h = ?$

Area =  $16.38 \text{ cm}^2$

$15.6 \times h = 16.38$

$h = \frac{16.38}{15.6} = 1.05 \text{ cm}$

Therefore, the height of such parallelogram is 1.05 cm.

**Question 4:**

Find the missing values:

Base	Height	Area of triangle
15 cm	_____	$87 \text{ cm}^2$

_____	31.4 mm	1256 mm <sup>2</sup>
22 cm	_____	170.5 cm <sup>2</sup>

Answer:

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

(a)  $b = 15 \text{ cm}$

$h = ?$

$$\text{Area} = \frac{1}{2} \times b \times h = 87 \text{ cm}^2$$

$$\frac{1}{2} \times 15 \times h = 87 \text{ cm}^2$$

$$h = \frac{87 \times 2}{15} = 11.6 \text{ cm}$$

Therefore, the height of such triangle is 11.6 cm.

(b)  $b = ?$

$h = 31.4 \text{ mm}$

$$\text{Area} = \frac{1}{2} \times b \times h = 1256 \text{ mm}^2$$

$$\frac{1}{2} \times b \times 31.4 = 1256$$

$$b = \frac{1256 \times 2}{31.4} = 80 \text{ mm}$$

Therefore, the base of such triangle is 80 mm.

(c)  $b = 22 \text{ cm}$

$h = ?$

$$\text{Area} = \frac{1}{2} \times b \times h = 170.5 \text{ cm}^2$$

$$\frac{1}{2} \times 22 \times h = 170.5 \text{ cm}^2$$

$$h = \frac{170.5 \times 2}{22} = 15.5 \text{ cm}$$

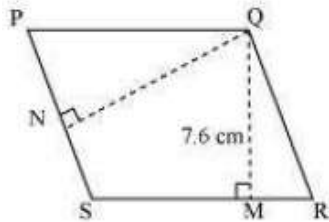
Therefore, the height of such triangle is 15.5 cm.

**Question 5:**

PQRS is a parallelogram (see the given figure). QM is the height from Q to SR and QN is the height from Q to PS. If SR = 12 cm and QM = 7.6 cm. Find:

(a) the area of the parallelogram PQRS

(b) QN, if PS = 8 cm



Answer:

(a) Area of parallelogram = Base  $\times$  Height = SR  $\times$  QM

$$= 7.6 \times 12 = 91.2 \text{ cm}^2$$

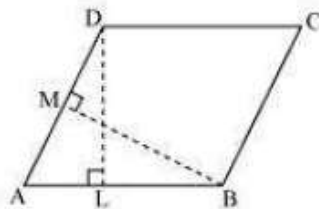
(b) Area of parallelogram = Base  $\times$  Height = PS  $\times$  QN = 91.2 cm<sup>2</sup>

$$\text{QN} \times 8 = 91.2$$

$$\text{QN} = \frac{91.2}{8} = 11.4 \text{ cm}$$

**Question 6:**

DL and BM are the heights on sides AB and AD respectively of parallelogram ABCD (see the given figure). If the area of the parallelogram is 1470 cm<sup>2</sup>, AB = 35 cm and AD = 49 cm, find the length of BM and DL.



Answer:

Area of parallelogram = Base  $\times$  Height = AB  $\times$  DL

$$1470 = 35 \times \text{DL}$$

$$\text{DL} = \frac{1470}{35} = 42 \text{ cm}$$

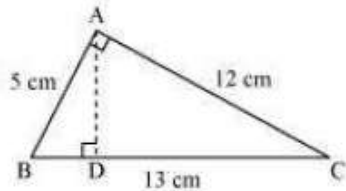
Also, 1470 = AD  $\times$  BM

$$1470 = 49 \times \text{BM}$$

$$BM = \frac{1470}{49} = 30 \text{ cm}$$

**Question 7:**

$\triangle ABC$  is right angled at A (see the given figure). AD is perpendicular to BC. If AB = 5 cm, BC = 13 cm and AC = 12 cm, Find the area of  $\triangle ABC$ . Also find the length of AD.



Answer:

$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$$

$$\text{Also, area of triangle} = \frac{1}{2} \times AD \times BC$$

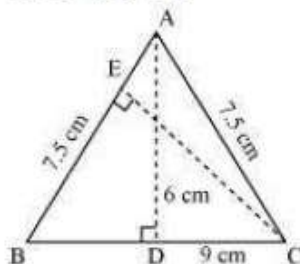
$$30 = \frac{1}{2} \times AD \times 13$$

$$\frac{30 \times 2}{13} = AD$$

$$AD = 4.6 \text{ cm}$$

**Question 8:**

$\triangle ABC$  is isosceles with AB = AC = 7.5 cm and BC = 9 cm (see the given figure). The height AD from A to BC, is 6 cm. Find the area of  $\triangle ABC$ . What will be the height from C to AB i.e., CE?



Answer:



$$\begin{aligned}\text{Area of } \triangle ABC &= \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times BC \times AD \\ &= \frac{1}{2} \times 9 \times 6 = 27 \text{ cm}^2\end{aligned}$$

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

$$27 = \frac{1}{2} \times 7.5 \times CE$$

$$CE = 7.2 \text{ cm}$$

### **Ex 11.3:-**

#### **Question 1**

Find the circumference of the circles with the following radius. (Take  $\pi = 227$ )

- (a) 14 cm
- (b) 28 mm
- (c) 21 cm

**Solution:**

(a) Given: Radius ( $r$ ) = 14 cm

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r = 2 \times 227 \times 14 \\ &= 88 \text{ cm}\end{aligned}$$

(b) Given: Radius ( $r$ ) = 28 mm

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r = 2 \times 227 \times 28 \\ &= 176 \text{ mm}\end{aligned}$$

(c) Given: Radius ( $r$ ) = 21 cm

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r = 2 \times 227 \times 21 \\ &= 132 \text{ cm}\end{aligned}$$

#### **Question 2**

Find the area of the following circles, given that (Take  $\pi = 227$ )

- (a) radius = 14 mm
- (b) diameter = 49 m
- (c) radius = 5 cm

**Solution:**

(a) Here,  $r = 14 \text{ mm}$

$$\begin{aligned}\therefore \text{Area of the circle} &= \pi r^2 \\ &= \pi \times 14 \times 14 = 227 \times 14 \times 14\end{aligned}$$

(b) Here, diameter = 49 m

$$\therefore r = \frac{49}{2} \text{ m}$$

$$\begin{aligned}\therefore \text{Area} &= \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} \\ &= \frac{3773}{2} \text{ m}^2 = 1886.5 \text{ m}^2\end{aligned}$$

(c) Here, radius = 5 cm

$$\begin{aligned}\therefore \text{Area} &= \pi r^2 = \frac{22}{7} \times 5 \times 5 \\ &= \frac{550}{7} \text{ cm}^2 = 78.57 \text{ cm}^2\end{aligned}$$

### Question 3

If the circumference of a circular sheet is 154 m, find its radius. Also find the area of the sheet. (Take  $\pi = 227$ )

**Solution:**

Given: Circumference = 154 m

$$\therefore 2\pi r = 154$$

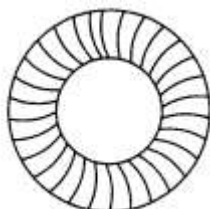
$$\Rightarrow 2 \times \frac{22}{7} \times r = 154$$

$$\therefore r = \frac{154 \times 7}{2 \times 22} = \frac{49}{2} \text{ m}$$

$$\begin{aligned}\text{Area of the sheet} &= \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} \\ &= \frac{3773}{2} \text{ m}^2 = 1886.5 \text{ m}^2\end{aligned}$$

### Question 4

A gardener wants to fence a circular garden of diameter 21 m. Find the length of the rope he needs to purchase, if he makes 2 rounds offence. Also find the cost of the rope, if it costs ₹ 4 per metre. (Take  $\pi = 227$ )



**Solution:**

Diameter of the circular garden = 21 m

$\therefore$  Radius = 10.5 m

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r = 2 \times 227 \times 10.5 \\ &= 4754 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Length of rope needed for 2 rounds} \\ &= 2 \times 4754 \text{ m} = 9508 \text{ m}\end{aligned}$$

$$\text{Cost of the rope} = ₹ 4 \times 9508 = ₹ 38032$$

### Question 5

From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Take  $\pi = 3.14$ )

**Solution:**

Radius of the circular sheet = 4 cm

$$\therefore \text{Area} = \pi r^2 = \pi \times 4 \times 4 = 16\pi \text{ cm}^2$$

Radius of the circle to be removed = 3 cm

$$\therefore \text{Area of sheet removed} = \pi r^2 = 9\pi \text{ cm}^2$$

Area of the remaining sheet

$$= (16\pi - 9\pi) \text{ cm}^2 = 7\pi \text{ cm}^2$$

$$= 7 \times 3.14 \text{ cm}^2 = 21.98 \text{ cm}^2$$

Hence, the required area = 21.98 cm<sup>2</sup>.

• **Question 6**

Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one metre of the lace costs ₹ 15. (Take  $\pi = 3.14$ )

**Solution:**

Diameter of the table cover = 1.5 m

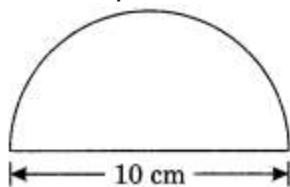
$\therefore$  Radius =  $1.52 = 0.75$  m

$\therefore$  Length of the lace =  $2\pi r = 2 \times 3.14 \times 0.75$   
= 4.710 m

Cost of the lace = ₹ 15  $\times$  4.710 = ₹ 70.65

**Question 7**

Find the perimeter of the given figure, which is a semicircle including its diameter.



**Solution:**

Given: Diameter = 10 cm

$$\therefore r = \frac{10}{2} \text{ cm} = 5 \text{ cm}$$

$\therefore$  Perimeter of the semicircle =  $\pi r$

$$= \frac{22}{7} \times 5 = \frac{110}{7} \text{ cm}$$

Perimeter of the figure including diameter

$$= \frac{110}{7} \text{ cm} + \text{diameter}$$

$$= \frac{110}{7} \text{ cm} + 10 \text{ cm}$$

$$= \left( \frac{110 + 70}{7} \right) \text{ cm}$$

$$= \frac{180}{7} \text{ cm} = 25.71 \text{ cm}$$

Hence, the required perimeter  
= 25.7 cm. (approx.)

**Question 8**

Find the cost of polishing a circular table-top of diameter 1.6 m, if the rate of polishing is ₹ 15 m<sup>2</sup>. (Take  $\pi = 3.14$ )

**Solution:**

Given:

Diameter = 1.6 m

∴ Radius =  $1.62 = 0.8$  m

Area of the table-top =  $\pi r^2$

=  $3.14 \times 0.8 \times 0.8$  m<sup>2</sup>

= 2.0096 m<sup>2</sup>

∴ Cost of polishing = ₹ 15 × 2.0096

= ₹ 30.14 (approx.)

**Question 9**

Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the square? (Take  $\pi = 227$ )

**Solution:**

Length of the wire to be bent into a circle = 44 cm

$2\pi r = 44$

$$2 \times \frac{22}{7} \times r = 44$$

$$\therefore r = \frac{44 \times 7}{2 \times 22} = 7 \text{ cm}$$

Area of such circle =  $\pi r^2$

$$= \frac{22}{7} \times 7 \times 7$$

$$= 154 \text{ cm}^2$$

Now, the length of the wire is bent into a square.

Here perimeter of square

= Circumference of line k

Length of each side of the square

= Perimeter  $4 = 44 = 11$  cm

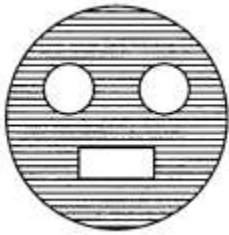
Area of the square = (Side)<sup>2</sup> = (11)<sup>2</sup> = 121 cm<sup>2</sup>

Since, 154 cm<sup>2</sup> > 121 cm<sup>2</sup>

Thus, the circle encloses more area.

**Question 10**

From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed, (as shown in the given figure below). Find the area of the remaining sheet. (Take  $\pi = 227$ )

**Solution:**

Radius of the circular sheet = 14 cm

$$\therefore \text{Area} = \pi r^2 = 227 \times 14 \times 14 \text{ cm}^2$$

$$= 616 \text{ cm}^2$$

Area of 2 small circles =  $2 \times \pi r^2$

$$= 2 \times 227 \times 3.5 \times 3.5 \text{ cm}^2$$

$$= 77.0 \text{ cm}^2$$

Area of the rectangle =  $l \times b$

$$= 3 \times 1 \text{ cm}^2 = 3 \text{ cm}^2$$

Area of the remaining sheet after removing the 2 circles and 1 rectangle

$$= 616 \text{ cm}^2 - (77 + 3) \text{ cm}^2$$

$$= 616 \text{ cm}^2 - 80 \text{ cm}^2 = 536 \text{ cm}^2$$

**Question 11**

A circle of radius 2 cm is cut out from a square piece of an aluminium sheet of side 6 cm. What is the area of the left over aluminium sheet? (Take  $\pi = 3.14$ )

**Solution:**

Side of the square sheet = 6 m

$$\therefore \text{Area of the sheet} = (\text{Side})^2 = (6)^2 = 36 \text{ cm}^2$$

Radius of the circle = 2 cm

$$\therefore \text{Area of the circle to be cut out} = \pi r^2$$

$$= 227 \times 2 \times 2 = 887 \text{ cm}^2$$

Area of the left over sheet

$$= 36 \text{ cm}^2 - \frac{88}{7} \text{ cm}^2$$

$$= \frac{252 - 88}{7} \text{ cm}^2 = \frac{164}{7} \text{ cm}^2$$

$$= 23.44 \text{ cm}^2$$

**Question 12**

The circumference of a circle is 31.4 cm. Find the radius and the area of the circle. (Take  $\pi = 3.14$ )

**Solution:**

Circumference of the circle = 31.4 cm

$$2\pi r = 31.4$$

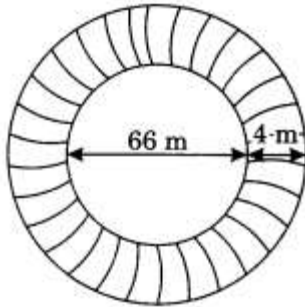
$$\therefore r = \frac{31.4}{2 \times 3.14} = 5 \text{ cm}$$

$$\text{Area of the circle} = \pi r^2 = 3.14 \times 5 \times 5 = 78.5 \text{ cm}^2$$

Hence, the required radius = 5 cm and area = 78.5 cm<sup>2</sup>.

**Question 13**

A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? (Take  $\pi = 3.14$ )

**Solution:**

Diameter of the flower bed = 66 m .

$\therefore$  Radius =  $66 \div 2 = 33$  m

Let  $r_1 = 33$  m

Width of the path = 4 m

Radius of the flower bed included path

= 33 m + 4 m = 37m

Let  $r_2 = 37$ m

Area of the circular path =  $\pi(r_2^2 - r_1^2)$

=  $3.14 (37^2 - 33^2)$

=  $3.14 \times (37 + 33) (37 - 33)$  [ $a^2 - b^2 = (a + b)(a - b)$ ]

=  $3.14 \times 70 \times 4 = 879.20 \text{ m}^2$

Hence, the required area = 879.20  $\text{m}^2$

**Question 14**

A circular flower garden has an area of 314  $\text{m}^2$ . A sprinkler at the centre of the garden can cover an area that has a radius of 12 m. Will the sprinkler can water the entire garden?

[Take  $\pi = 3.14$ ]

**Solution:**

Area of the flower garden = 314  $\text{m}^2$

Radius of the circular portion covered by the sprinkler = 12 m

$\therefore$  Area =  $\pi r^2 = 3.14 \times 12 \times 12$

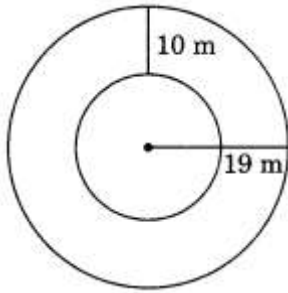
=  $3.14 \times 144 \text{ m}^2 = 452.16 \text{ m}^2$

Since  $452.16 \text{ m}^2 > 314 \text{ m}^2$

Yes, the sprinkler will water the entire garden.

**Question 15**

Find the circumference of the inner and the outer circles, shown in the given figure.  
(Take  $\pi = 3.14$ )

**Solution**

Radius of the outer circle = 19 m

$$\begin{aligned}\therefore \text{Circumference of the outer circle} &= 2\pi r \\ &= 2 \times 3.14 \times 19 = 3.14 \times 38 \text{ m} \\ &= 119.32 \text{ m}\end{aligned}$$

Radius of the inner circle

$$= 19\text{m} - 10\text{m} = 9\text{m}$$

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r = 2 \times 3.14 \times 9 \\ &= 56.52 \text{ m}\end{aligned}$$

Here the required circumferences are 56.52 m and 119.32 m.

**Question 16**

How many times a wheel of radius 28 cm must rotate to go 352 m? (Take  $\pi = 22/7$ )

**Solution:**

Radius of the wheel = 28 cm

$$\therefore \text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 28 = 176 \text{ cm}$$

Number of rotations made by the wheel in going 352 m or 35200 cm

$$= \frac{35200}{176} = 200$$

Hence, the required number of rotation = 200.

**Question 17**

The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour? (Take  $\pi = 3.14$ )

**Solution:**

Length of minute hand = 15 cm

$$\therefore \text{Radius} = 15 \text{ cm}$$

$$\text{Circumference} = 2\pi r$$

$$= 2 \times 3.14 \times 15 \text{ cm} = 94.2 \text{ cm}$$

Since the minute hand covers the distance in 1 hour equal to the circumference of the circle. Here the required distance covered by the minute hand = 94.2 cm.

**Question 1:**

Find the circumference of the circles with the following radius: (Taken  $= \frac{22}{7}$  )

(a) 14 cm (b) 28 mm (c) 21 cm

Answer:

(a)  $r = 14$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 14 = 88 \text{ cm}$$

(b)  $r = 28$  mm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 28 = 176 \text{ mm}$$

(c)  $r = 21$  cm

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 21 = 132 \text{ cm}$$

**Question 2:**

Find the area of the following circles, given that:

(a) radius = 14 mm (Taken  $= \frac{22}{7}$  ) (b) diameter = 49 m

(c) radius = 5 cm

Answer:

(a)  $r = 14$  mm

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 14 \times 14 = 616 \text{ mm}^2$$

(b)  $d = 49$  m

$$r = \frac{49}{2} \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

(c)  $r = 5$  cm

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 5 \times 5 = \frac{550}{7} = 78.57 \text{ cm}^2$$



**Question 3:**

If the circumference of a circular sheet is 154m, find its radius. Also find the area of

the sheet. (Taken  $= \frac{22}{7}$ )

Answer:

$$\text{Circumference} = 2\pi r = 154 \text{ m}$$

$$2 \times \frac{22}{7} \times r = 154$$

$$r = 154 \times \frac{7}{44} = \frac{49}{2} = 24.5 \text{ m}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times r^2$$

$$= \frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} = 1886.5 \text{ m}^2$$

**Question 4:**

A gardener wants to fence a circular garden of diameter 21 m. Find the length of the rope he needs to purchase, if he makes 2 rounds of fence. Also find the costs of the

rope, if it cost Rs 4 per meter. (Taken  $= \frac{22}{7}$ )

Answer:

$$d = 21 \text{ m}$$

$$r = \frac{21}{2} \text{ m}$$

$$\text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times \frac{21}{2} = 66 \text{ m}$$

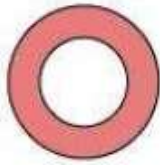
$$\text{Length of rope required for fencing} = 2 \times 66 \text{ m} = 132 \text{ m}$$

$$\text{Cost of 1 m rope} = \text{Rs } 4$$

$$\text{Cost of 132 m rope} = 4 \times 132 = \text{Rs } 528$$

**Question 5:**

From a circular sheet of radius 4 cm, a circle of radius 3 cm is removed. Find the area of the remaining sheet. (Taken  $= 3.14$ )



Answer:

Outer radius of circular sheet = 4 cm

Inner radius of circular sheet = 3 cm

Remaining area =  $3.14 \times 4 \times 4 - 3.14 \times 3 \times 3$

=  $50.24 - 28.26$

=  $21.98 \text{ cm}^2$

**Question 6:**

Saima wants to put a lace on the edge of a circular table cover of diameter 1.5 m. Find the length of the lace required and also find its cost if one meter of the lace costs Rs 15. (

Taken = 3.14)

Answer:

Circumference =  $2\pi r$

$$= 2 \times 3.14 \times \frac{d}{2}$$

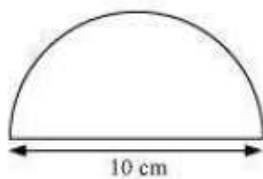
$$= 2 \times 3.14 \times \frac{1.5}{2} = 4.71 \text{ m}$$

Cost of 1 m lace = Rs 15

Cost of 4.71 m lace =  $4.71 \times 15 = \text{Rs } 70.65$

**Question 7:**

Find the perimeter of the adjoining figure, which is a semicircle including its diameter.



Answer:

Radius = 5 cm

Length of curved part =  $\pi r$

$$= \frac{22}{7} \times 5$$

$$= 15.71 \text{ cm}$$

Total perimeter = Length of curved part + Length of diameter

$$= 15.71 + 10 = 25.71 \text{ cm}$$

**Question 8:**

Find the cost of polishing a circular table-top of diameter 1.6 m, if the rate of polishing is Rs 15/m<sup>2</sup>. (Take  $\pi = 3.14$ )

Answer:

$$\text{Diameter} = 1.6 \text{ m}$$

$$\text{Radius} = \frac{1.6}{2} = 0.8 \text{ m}$$

$$\text{Area} = 3.14 \times 0.8 \times 0.8$$

$$= 2.0096 \text{ m}^2$$

Cost for polishing 1 m<sup>2</sup> area = Rs 15

$$\text{Cost for polishing } 2.0096 \text{ m}^2 \text{ area} = 15 \times 2.0096 = 30.14$$

Therefore, it will cost Rs 30.14 for polishing such circular table.

**Question 9:**

Shazli took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area, the circle or the

square? (Taken  $\pi = \frac{22}{7}$ )

Answer:

$$\text{Circumference} = 2\pi r = 44 \text{ cm}$$

$$2 \times \frac{22}{7} \times r = 44$$

$$r = 7 \text{ cm}$$

$$\text{Area} = \pi r^2 = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

If the wire is bent into a square, then the length of each side would be  $= \frac{44}{4} = 11 \text{ cm}$

$$\text{Area of square} = (11)^2 = 121 \text{ cm}^2$$

Therefore, circle encloses more area.

**Question 10:**

From a circular card sheet of radius 14 cm, two circles of radius 3.5 cm and a rectangle of length 3 cm and breadth 1 cm are removed (as shown in the following figure). Find

the area of the remaining sheet. (Taken  $= \frac{22}{7}$  )



Answer:

$$\text{Area of bigger circle} = \frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$$

$$\text{Area of 2 small circles} = 2 \times \pi r^2 = 2 \times \frac{22}{7} \times 3.5 \times 3.5 = 77 \text{ cm}^2$$

$$\text{Area of rectangle} = \text{Length} \times \text{Breadth} = 3 \times 1 = 3 \text{ cm}^2$$

$$\text{Remaining area of sheet} = 616 - 77 - 3 = 536 \text{ cm}^2$$

**Question 11:**

A circle of radius 2 cm is cut out from a square piece of an aluminium sheet of side 6 cm. What is the area of the left over aluminium sheet? (Take  $\pi = 3.14$ )

Answer:

$$\text{Area of square-shaped sheet} = (\text{Side})^2 = (6)^2 = 36 \text{ cm}^2$$

$$\text{Area of circle} = 3.14 \times 2 \times 2 = 12.56 \text{ cm}^2$$

$$\text{Remaining area of sheet} = 36 - 12.56 = 23.44 \text{ cm}^2$$

**Question 12:**

The circumference of a circle is 31.4 cm. Find the radius and the area of the circle? (Take  $\pi = 3.14$ )

Answer:

$$\text{Circumference} = 2\pi r = 31.4 \text{ cm}$$

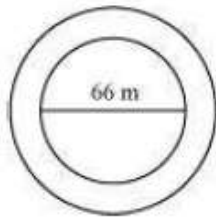
$$2 \times 3.14 \times r = 31.4$$

$$r = 5 \text{ cm}$$

$$\text{Area} = 3.14 \times 5 \times 5 = 78.50 \text{ cm}^2$$

**Question 13:**

A circular flower bed is surrounded by a path 4 m wide. The diameter of the flower bed is 66 m. What is the area of this path? ( $\pi = 3.14$ )



Answer:

$$\text{Radius of flower bed} = \frac{66}{2} = 33 \text{ m}$$

$$\text{Radius of flower bed and path together} = 33 + 4 = 37 \text{ m}$$

$$\text{Area of flower bed and path together} = 3.14 \times 37 \times 37 = 4298.66 \text{ m}^2$$

$$\text{Area of flower bed} = 3.14 \times 33 \times 33 = 3419.46 \text{ m}^2$$

$$\begin{aligned} \text{Area of path} &= \text{Area of flower bed and path together} - \text{Area of flower bed} \\ &= 4298.66 - 3419.46 = 879.20 \text{ m}^2 \end{aligned}$$

**Question 14:**

A circular flower garden has an area of  $314 \text{ m}^2$ . A sprinkler at the centre of the garden can cover an area that has a radius of 12 m. Will the sprinkler water the entire garden? (Take  $\pi = 3.14$ )

Answer:

$$\text{Area} = \pi r^2 = 314 \text{ m}^2$$

$$3.14 \times r^2 = 314$$

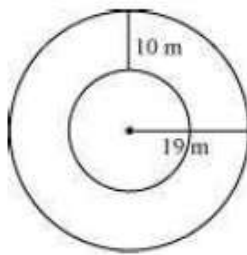
$$r^2 = 100$$

$$r = 10 \text{ m}$$

Yes, the sprinkler will water the whole garden.

**Question 15:**

Find the circumference of the inner and the outer circles, shown in the adjoining figure? (Take  $\pi = 3.14$ )



Answer:

Radius of outer circle = 19 m

Circumference =  $2\pi r = 2 \times 3.14 \times 19 = 119.32$  m

Radius of inner circle =  $19 - 10 = 9$  m

Circumference =  $2\pi r = 2 \times 3.14 \times 9 = 56.52$  m

**Question 16:**

How many times a wheel of radius 28 cm must rotate to go 352 m?

(Take  $n = \frac{22}{7}$ )

Answer:

$r = 28$  cm

Circumference =  $2\pi r = 2 \times \frac{22}{7} \times 28 = 176$  cm

Number of rotations =  $\frac{\text{Total distance to be covered}}{\text{Circumference of wheel}} = \frac{352\text{m}}{176\text{cm}} = \frac{35200}{176} = 200$

Therefore, it will rotate 200 times.

**Question 17:**

The minute hand of a circular clock is 15 cm long. How far does the tip of the minute hand move in 1 hour. (Take  $n = 3.14$ )

Answer:

Distance travelled by the tip of minute hand = Circumference of the clock

$= 2\pi r = 2 \times 3.14 \times 15$

$= 94.2$  cm

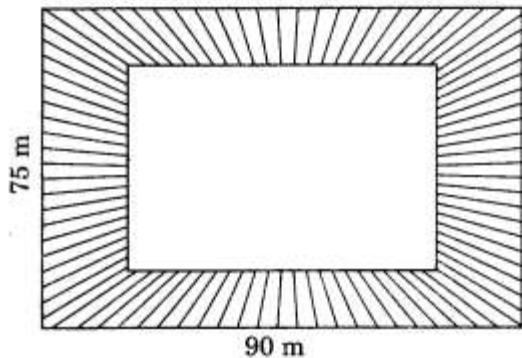


#### Ex 11.4:-

##### Question 1

A garden is 90 m long and 75 m broad. A path 5 m wide is to be built outside and around it. Find the area of the path. Also find the area of the garden in hectare.

**Solution:**



Given: Length = 90 m

Breadth = 75 m

Area of the garden =  $l \times b$

$$= 90 \text{ m} \times 75 \text{ m} = 6750 \text{ m}^2$$

Length of the garden including path

$$= 90 \text{ m} + 5 \text{ m} + 5 \text{ m} = 100 \text{ m}$$

Breadth of the garden including path

$$= 75 \text{ m} + 5 \text{ m} + 5 \text{ m} = 85 \text{ m}$$

Area of the garden including path

$$= l \times b$$

$$= 100 \text{ m} \times 85 \text{ m} = 8500 \text{ m}^2$$

$$\text{Area of the path} = 8500 \text{ m}^2 - 6750 \text{ m}^2 = 1750 \text{ m}^2$$

Hence, required area of path =  $1750 \text{ m}^2$  and area of the garden =  $6750 \text{ m}^2 = 0.675 \text{ ha}$

##### Question 2

A 3 m wide path runs outside and around a rectangular park of length 125 m and breadth 65 m. Find the area of the path.

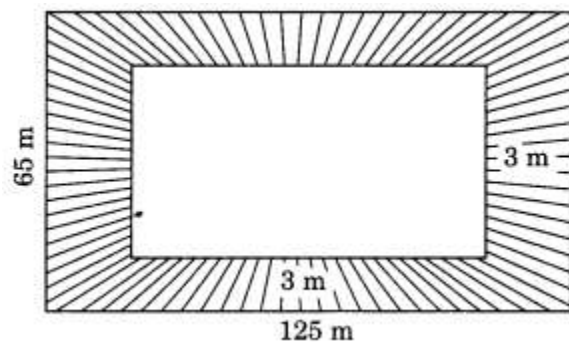
**Solution:**

Length of the park = 125 m

Breadth of the park = 65 m

Area of the park =  $l \times b$

$$= 125 \text{ m} \times 65 \text{ m} = 8125 \text{ m}^2$$



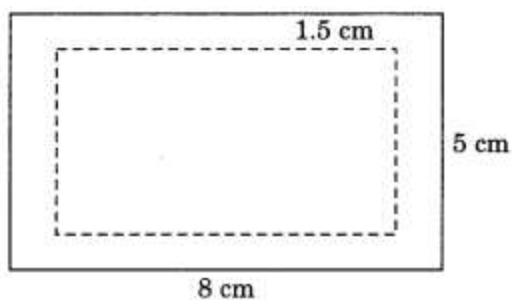
Length of the park including path

$= 125 \text{ m} + 3\text{m} + 3\text{m} = 131 \text{ m}$   
 Breadth of the park including path  
 $= 65\text{m} + 3\text{m} + 3\text{m} = 71\text{m}$   
 Area of the park including path  
 $= 131 \text{ m} \times 71 \text{ m} = 9301 \text{ m}^2$   
 $\therefore$  Area of the path  
 $= 9301 \text{ m}^2 - 8125 \text{ m}^2 = 1176 \text{ m}^2$   
 Hence, the required area =  $1176 \text{ m}^2$ .

### Question 3

A picture is painted on a cardboard 8 cm long and 5 cm wide such that there is a margin of 1.5 cm along each of its sides. Find the total area of the margin.

**Solution:**



Length = 8 cm, breadth = 5 cm  
 Area of the cardboard =  $l \times b$   
 $= 8 \text{ cm} \times 5 \text{ cm} = 40 \text{ cm}^2$   
 Width of the margin = 1.5 cm  
 Length of the inner cardboard  
 $= 8 \text{ cm} - 1.5 \times 2 \text{ cm}$   
 $= 8 \text{ cm} - 3 \text{ cm} = 5 \text{ cm}$   
 Breadth of the inner cardboard  
 $= 5 \text{ cm} - 1.5 \times 2 \text{ cm}$   
 $= 5 \text{ cm} - 3 \text{ cm} = 2 \text{ cm}$   
 Area of the inner rectangle =  $l \times b$   
 $= 5 \text{ cm} \times 2 \text{ cm} = 10 \text{ cm}^2$  Area of the margin  
 $= 40 \text{ cm}^2 - 10 \text{ cm}^2 = 30 \text{ cm}^2$   
 Hence, the required area =  $30 \text{ cm}^2$ .

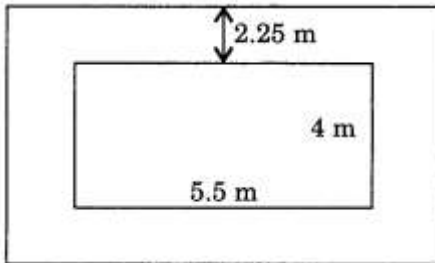


#### Question 4

A verandah of width 2.25 m is constructed all along outside a room which is 5.5 m long and 4 m wide. Find:

- (i) the area of the verandah.
- (ii) the cost of cementing the floor of the verandah at the rate of ₹ 200 per  $\text{m}^2$ .

**Solution:**



Length of the room = 5.5 m

Breadth of the room = 4 m

$\therefore$  Area of the room =  $l \times b = 5.5 \text{ m} \times 4 \text{ m} = 22 \text{ m}^2$

Width of the verandah = 2.25 m

Length of the room including verandah  
=  $5.5 \text{ m} + 2 \times 2.25 \text{ m} = 10 \text{ m}$

Breadth of the room including verandah  
=  $4 \text{ m} + 2 \times 2.25 \text{ m} = 8.50 \text{ m}^2$

Area of the room including verandah =  $l \times b$   
=  $10 \text{ m} \times 8.50 \text{ m} = 85 \text{ m}^2$

(i) Area of the verandah =  $85 \text{ m}^2 - 22 \text{ m}^2$   
=  $63 \text{ m}^2$

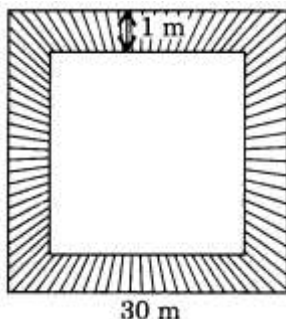
(ii) Cost of cementing the floor of the verandah = ₹  $63 \times 200 = ₹12600$

#### Question 5

A path 1 m wide is built along the border and inside a square garden of side 30 m. Find:

- (i) the area of the path.
- (ii) the cost of planting grass in the remaining portion of the garden at the rate of ₹ 40 per  $\text{m}^2$ .

**Solution:**



Area of the square garden =  $(\text{Side})^2$   
=  $30 \text{ m} \times 30 \text{ m} = 900 \text{ m}^2$

Length of the garden excluding the path =  $30 \text{ m} - 2 \times 1 \text{ m} = 28 \text{ m}$   
 $\therefore$  Area of the garden excluding the path =  $28 \text{ m} \times 28 \text{ m} = 784 \text{ m}^2$

(i) Area of the path =  $900 \text{ m}^2 - 784 \text{ m}^2$

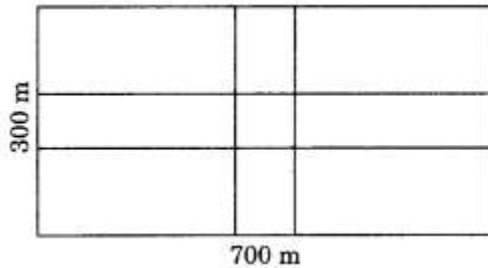
$$= 116 \text{ m}^2$$

(ii) Cost of the planting the remaining portion at the rate of ₹ 40 per  $\text{m}^2$   
 $= ₹ 40 \times 784 = ₹ 31,360$

### Question 6

Two cross roads, each of width 10 m, cut at right angles through the centre of a rectangular park of length 700 m and breadth 300 m and parallel to its sides. Find the area of the roads. Also find the area of the park excluding cross roads. Give the answer in hectares.

**Solution:**



Length of the road parallel to the length of the park = 700 m

Width of the road = 10 m

$\therefore$  Area of the road =  $l \times b = 700 \text{ m} \times 10 \text{ m} = 7000 \text{ m}^2$

Length of the road parallel to the breadth of the park = 300 m

Width of the road = 10 m Area of this road =  $l \times b = 300 \text{ m} \times 10 = 3000 \text{ m}^2$

Area of the both roads

$= 7000 \text{ m}^2 + 3000 \text{ m}^2 - \text{Area of the common portion}$

$= 10,000 \text{ m}^2 - 10 \text{ m} \times 10 \text{ m}$

$= 10,000 \text{ m}^2 - 100 \text{ m}^2$

$= 9900 \text{ m}^2 = 0.99 \text{ ha}$

Area of the park =  $l \times b$

$= 700 \text{ m} \times 300 \text{ m} = 210000 \text{ m}^2$

Area of the park excluding the roads

$= 210000 \text{ m}^2 - 9900 \text{ m}^2$

$= 200100 \text{ m}^2 = 20.01 \text{ ha}$

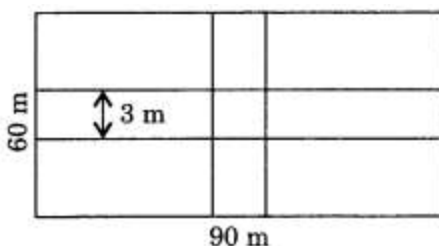
### Question 7

Through a rectangular field of length 90 m and breadth 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the fields. If the width of each road is 3 m, find

(i) the area covered by the roads.

(ii) the cost of constructing the roads at of the rate of ₹ 110 per  $\text{m}^2$ .

**Solution:**



Length of the road along the length of the field = 90 m

Breadth = 3 m

$\therefore$  Area of this road =  $l \times b$   
 $= 90 \text{ m} \times 3 \text{ m} = 270 \text{ m}^2$

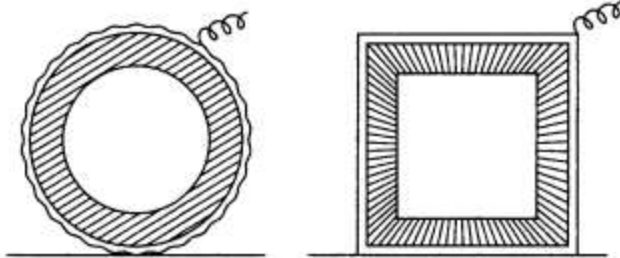
Similarly, the area of the road parallel to the breadth of the field =  $l \times b$   
 $= 60 \text{ m} \times 3 \text{ m} = 180 \text{ m}^2$  Area of the common portion  
 $= 3 \text{ m} \times 3 \text{ m} = 9 \text{ m}^2$

(i) Area of the two roads  
 $= 270 \text{ m}^2 + 180 \text{ m}^2 - 9 \text{ m}^2$   
 $= 450 \text{ m}^2 - 9 \text{ m}^2 = 441 \text{ m}^2$

(ii) Cost of constructing the roads  
 $= ₹ 110 \times 441 = ₹ 48,510$

### Question 8

Pragya wrapped a cord around a circular pipe of radius 4 cm and cut off the length required of the cord. Then she wrapped it around a square box of side 4 cm (also shown). Did she have any cord left? ( $\pi = 3.14$ )



#### Solution:

Length of the cord = Circumference of the circular pipe  
 $= 2\pi r = 2 \times 3.14 \times 4 = 25.12 \text{ cm}$

Perimeter of the square box  
 $= 4 \times \text{side} = 4 \times 4 \text{ cm} = 16 \text{ cm}$

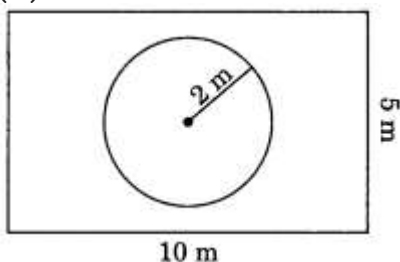
Length of the cord left  
 $= 25.12 \text{ cm} - 16 \text{ cm} = 9.12 \text{ cm}$

Yes, 9.12 cm cord is left.

### Question 9

The given figure represents a rectangular lawn with a circular flower bed in the middle. Find:

- (i) the area of the whole land.
- (ii) the area of the flower bed.
- (iii) the area of the lawn excluding the area of the flower bed.
- (iv) the circumference of the flower bed.



**Solution:**

(i) Length of the lawn = 10 m

Breadth of the lawn = 5 m

Area of the lawn =  $l \times b$

$$= 10 \text{ m} \times 5 \text{ m} = 50 \text{ m}^2$$

(ii) Area of the circular flower bed =  $\pi r^2$

$$= 22 \times 2 \times 2 = 88 \text{ m}^2 = 12.57 \text{ m}^2$$

(iii) Area of the lawn excluding the area of the flower bed

$$= 50 \text{ m}^2 - \frac{88}{7} \text{ m}^2$$

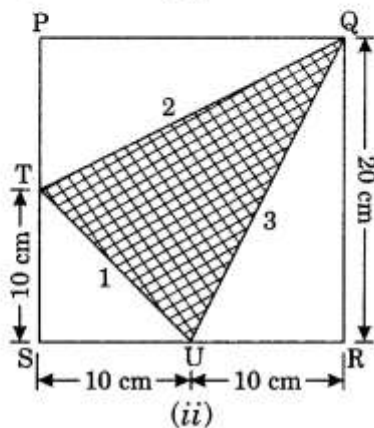
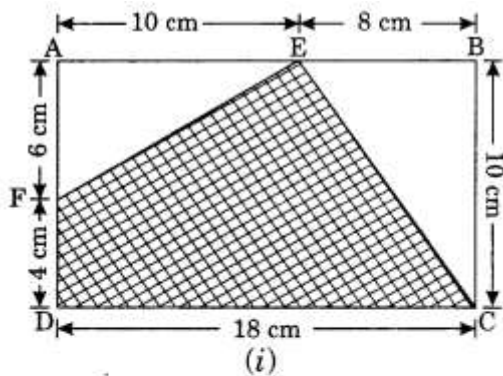
$$= \frac{350 - 88}{7} \text{ m}^2 = \frac{262}{7} \text{ m}^2 = 37.43 \text{ m}^2$$

(iv) Circumference of the flower bed =  $2\pi r$

$$= 2 \times \frac{22}{7} \times 2 = \frac{88}{7} \text{ m}^2 = 12.57 \text{ m}^2$$

**Question 10**

In the following figures, find the area of the shaded portion.



**Solution:**

(i) Area of the rectangle =  $l \times b$

$$= 18 \text{ cm} \times (6 \text{ cm} + 4 \text{ cm})$$

$$= 18 \text{ cm} \times 10 \text{ cm} = 180 \text{ cm}^2$$

Area of right triangle

$$= \frac{1}{2} \times b \times h = \frac{1}{2} \times 6 \times 10 = 30 \text{ cm}^2$$

$$\text{Area of right } \triangle BCE = \frac{1}{2} \times b \times h$$

$$= 12 \times 8 \times 10 = 40 \text{ cm}^2$$

Area of the two right triangles

$$= 30 \text{ cm}^2 + 40 \text{ cm}^2 = 70 \text{ cm}^2$$

Area of the shaded portion

$$= 180 \text{ cm}^2 - 70 \text{ cm}^2 = 110 \text{ cm}^2$$

(ii) Area of the square PQRS = (Side)<sup>2</sup>

$$= (20)^2 = 400 \text{ cm}^2$$

$$\begin{aligned} \text{Area of triangle (1)} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 10 \times 10 = 50 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of triangle (2)} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 10 \times 20 = 100 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of triangle (3)} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 10 \times 20 = 100 \text{ cm}^2 \end{aligned}$$

Area of the three triangles

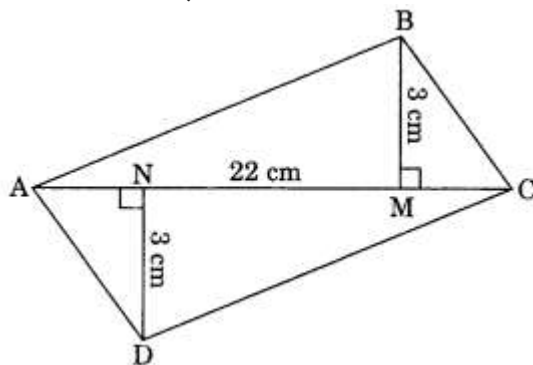
$$= 50 \text{ cm}^2 + 100 \text{ cm}^2 + 100 \text{ cm}^2 = 250 \text{ cm}^2$$

Area of the shaded portion

$$= 400 \text{ cm}^2 - 250 \text{ cm}^2 = 150 \text{ cm}^2$$

### Question 11

Find the area of the quadrilateral ABCD. Here, AC = 22 cm, BM = 3 cm, DN = 3 cm, and BM ⊥ AC, DN ⊥ AC.



**Solution:**

$$\text{Area of } \triangle ABC = \frac{1}{2} \times b \times h = \frac{1}{2} \times 22 \times 3 = 33 \text{ cm}^2$$

$$\begin{aligned} \text{Area of } \triangle ADC &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 22 \times 3 = 33 \text{ cm}^2 \end{aligned}$$

Area of the quadrilateral ABCD

$$= \text{Area of } \triangle ABC + \text{Area of } \triangle ADC$$

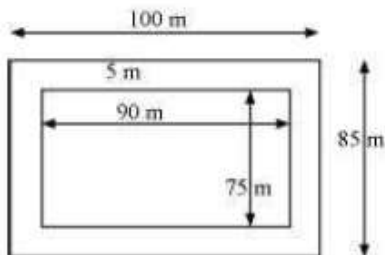
$$= 33 \text{ cm}^2 + 33 \text{ cm}^2 = 66 \text{ cm}^2$$

Hence, the required area =  $66 \text{ cm}^2$ .

**Question 1:**

A garden is 90 m long and 75 m broad. A path 5 m wide is to be built outside and around it. Find the area of the path. Also find the area of the garden in hectare.

Answer:



Length ( $l$ ) of garden = 90 m

Breadth ( $b$ ) of garden = 75 m

$$\text{Area of garden} = l \times b = 90 \times 75 = 6750 \text{ m}^2$$

From the figure, it can be observed that the new length and breadth of the garden, when path is also included, are 100m and 85m respectively.

$$\text{Area of the garden including the path} = 100 \times 85 = 8500 \text{ m}^2$$

$$\begin{aligned} \text{Area of path} &= \text{Area of the garden including the path} - \text{Area of garden} \\ &= 8500 - 6750 = 1750 \text{ m}^2 \end{aligned}$$

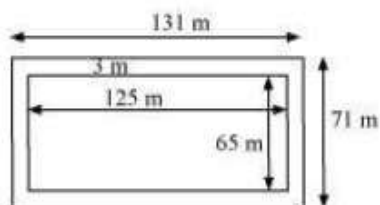
$$1 \text{ hectare} = 10000 \text{ m}^2$$

$$\text{Therefore, area of garden in hectare} = \frac{6750}{10000} = 0.675 \text{ hectare}$$

**Question 2:**

A 3 m wide path runs outside and around a rectangular park of length 125 m and breadth 65 m. Find the area of the path.

Answer:



Length ( $l$ ) of park = 125 m

Breadth ( $b$ ) of park = 65 m

$$\text{Area of park} = l \times b = 125 \times 65 = 8125 \text{ m}^2$$

From the figure, it can be observed that the new length and breadth of the park, when path is also included, are 131 m and 71 m respectively.

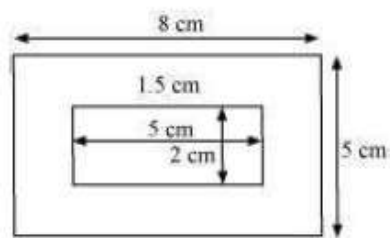
$$\text{Area of the park including the path} = 131 \times 71 = 9301 \text{ m}^2$$

$$\begin{aligned}\text{Area of path} &= \text{Area of the park including the path} - \text{Area of park} \\ &= 9301 - 8125 = 1176 \text{ m}^2\end{aligned}$$

**Question 3:**

A picture is painted on a cardboard 8 cm long and 5 cm wide such that there is a margin of 1.5 cm along each of its sides. Find the total area of the margin.

Answer:



Length ( $l$ ) of cardboard = 8 cm

Breadth ( $b$ ) of cardboard = 5 cm

$$\text{Area of cardboard including margin} = l \times b = 8 \times 5 = 40 \text{ cm}^2$$

From the figure, it can be observed that the new length and breadth of the cardboard, when margin is not included, are 5 cm and 2 cm respectively.

$$\text{Area of the cardboard not including the margin} = 5 \times 2 = 10 \text{ cm}^2$$

$$\begin{aligned}\text{Area of the margin} &= \text{Area of cardboard including the margin} - \text{Area of cardboard not including the margin} \\ &= 40 - 10 = 30 \text{ cm}^2\end{aligned}$$

**Question 4:**

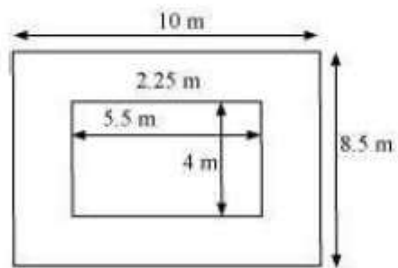
A verandah of width 2.25 m is constructed all along outside a room which is 5.5 m long and 4 m wide. Find:

(i) the area of the verandah

(ii) the cost of cementing the floor of the verandah at the rate of Rs 200 per  $\text{m}^2$ .



Answer:



(i)

Length ( $l$ ) of room = 5.5 m

Breadth ( $b$ ) of room = 4 m

Area of room =  $l \times b = 5.5 \times 4 = 22 \text{ m}^2$

From the figure, it can be observed that the new length and breadth of the room, when verandah is also included, are 10 m and 8.5 m respectively.

Area of the room including the verandah =  $10 \times 8.5 = 85 \text{ m}^2$

Area of verandah = Area of the room including the verandah – Area of room  
 $= 85 - 22 = 63 \text{ m}^2$

(ii)

Cost of cementing  $1 \text{ m}^2$  area of the floor of the verandah = Rs 200

Cost of cementing  $63 \text{ m}^2$  area of the floor of the verandah =  $200 \times 63$   
 $= \text{Rs } 12600$

**Question 5:**

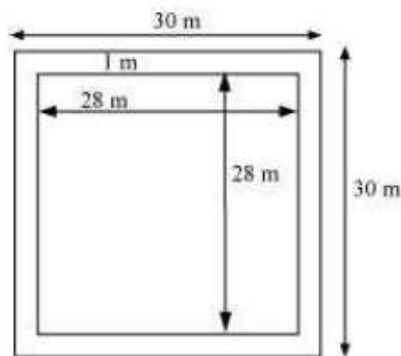
A path 1 m wide is built along the border and inside a square garden of side 30 m. Find:

(i) the area of the path

(ii) the cost of planting grass in the remaining portion of the garden at the rate of Rs 40 per  $\text{m}^2$ .

Answer:





(i)

Side ( $a$ ) of square garden = 30 m

Area of square garden including path =  $a^2 = (30)^2 = 900 \text{ m}^2$

From the figure, it can be observed that the side of the square garden, when path is not included, is 28 m.

Area of the square garden not including the path =  $(28)^2 = 784 \text{ m}^2$

Area of path = Area of the square garden including the path – Area of square garden not including the path

=  $900 - 784 = 116 \text{ m}^2$

(ii)

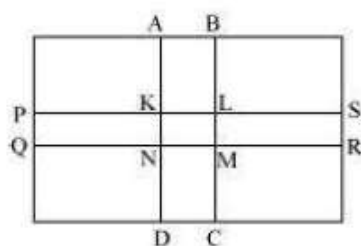
Cost of planting grass in  $1 \text{ m}^2$  area of the garden = Rs 40

Cost of planting grass in  $784 \text{ m}^2$  area of the garden =  $784 \times 40 = \text{Rs } 31360$

#### Question 6:

Two cross roads, each of width 10 m, cut at right angles through the centre of a rectangular park of length 700 m and breadth 300 m and parallel to its sides. Find the area of the roads. Also find the area of the park excluding cross roads. Give the answer in hectares.

Answer:



Length ( $l$ ) of park = 700 m

Breadth ( $b$ ) of park = 300 m

$$\text{Area of park} = 700 \times 300 = 210000 \text{ m}^2$$

$$\text{Length of road PQRS} = 700 \text{ m}$$

$$\text{Length of road ABCD} = 300 \text{ m}$$

$$\text{Width of each road} = 10 \text{ m}$$

$$\text{Area of the roads} = \text{ar (PQRS)} + \text{ar (ABCD)} - \text{ar (KLMN)}$$

$$= (700 \times 10) + (300 \times 10) - (10 \times 10)$$

$$= 7000 + 3000 - 100$$

$$= 10000 - 100 = 9900 \text{ m}^2 = 0.99 \text{ hectare}$$

$$\text{Area of park excluding roads} = 210000 - 9900 = 200100 \text{ m}^2 = 20.01 \text{ hectare}$$

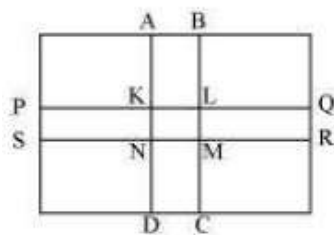
#### Question 7:

Through a rectangular field of length 90 m and breadth 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the fields. If the width of each road is 3 m, find

(i) the area covered by the roads.

(ii) the cost of constructing the roads at the rate of Rs 110 per  $\text{m}^2$ .

Answer:



$$\text{Length (l) of field} = 90 \text{ m}$$

$$\text{Breadth (b) of field} = 60 \text{ m}$$

$$\text{Area of field} = 90 \times 60 = 5400 \text{ m}^2$$

$$\text{Length of road PQRS} = 90 \text{ m}$$

$$\text{Length of road ABCD} = 60 \text{ m}$$

$$\text{Width of each road} = 3 \text{ m}$$

$$\text{Area of the roads} = \text{ar (PQRS)} + \text{ar (ABCD)} - \text{ar (KLMN)}$$

$$= (90 \times 3) + (60 \times 3) - (3 \times 3)$$

$$= 270 + 180 - 9 = 441 \text{ m}^2$$

$$\text{Cost for constructing 1 m}^2 \text{ road} = \text{Rs } 110$$

$$\text{Cost for constructing 441 m}^2 \text{ road} = 110 \times 441 = \text{Rs } 48510$$

**Question 8:**

Pragya wrapped a cord around a circular pipe of radius 4 cm (adjoining figure) and cut off the length required of the cord. Then she wrapped it around a square box of side 4 cm (also shown). Did she have any cord left? ( $\pi = 3.14$ ).



Answer:

Perimeter of the square =  $4 \times \text{Side of the square} = 4 \times 4 = 16 \text{ cm}$

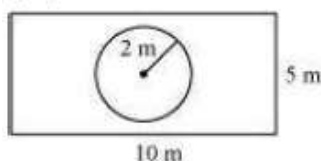
Perimeter of circular pipe =  $2\pi r = 2 \times 3.14 \times 4 = 25.12 \text{ cm}$

Length of chord left with Pragya =  $25.12 - 16 = 9.12 \text{ cm}$

**Question 9:**

The adjoining figure represents a rectangular lawn with a circular flower bed in the middle. Find:

- (i) the area of the whole land
- (ii) the area of the flower bed
- (iii) the area of the lawn excluding the area of the flower bed
- (iv) the circumference of the flower bed.



Answer:

(i) Area of whole land = Length  $\times$  Breadth =  $10 \times 5 = 50 \text{ m}^2$

(ii) Area of flower bed =  $\pi r^2 = 3.14 \times 2 \times 2 = 12.56 \text{ m}^2$

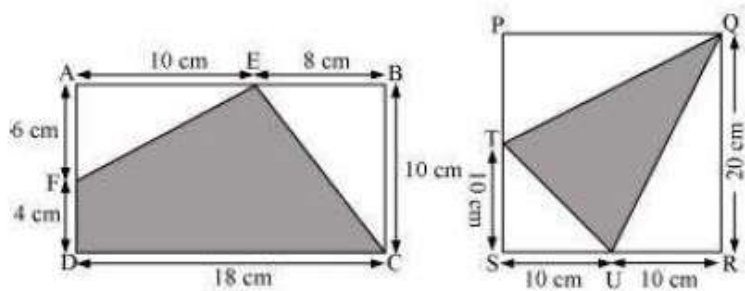
(iii) Area of lawn excluding the flower bed = Area of whole land – Area of flower bed

=  $50 - 12.56 = 37.44 \text{ m}^2$

(iv) Circumference of flower bed =  $2\pi r = 2 \times 3.14 \times 2 = 12.56 \text{ m}$

**Question 10:**

In the following figures, find the area of the shaded portions:



Answer:

(i)

Area of EFDC = ar (ABCD) – ar (BCE) – ar (AFE)

$$\begin{aligned}
 &= (18 \times 10) - \frac{1}{2} (10 \times 8) - \frac{1}{2} (6 \times 10) \\
 &= 180 - 40 - 30 = 110 \text{ cm}^2
 \end{aligned}$$

(ii)

ar (QTU) = ar (PQRS) – ar (TSU) – ar (RUQ) – ar (PQT)

$$\begin{aligned}
 &= (20 \times 20) - \frac{1}{2} (10 \times 10) - \frac{1}{2} (20 \times 10) - \frac{1}{2} (20 \times 10) \\
 &= 400 - 50 - 100 - 100 = 150 \text{ cm}^2
 \end{aligned}$$

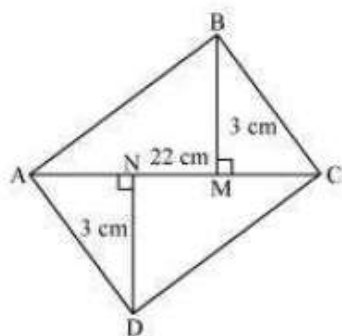
**Question 11:**

Find the area of the quadrilateral ABCD.

Here, AC = 22 cm, BM = 3 cm,

DN = 3 cm, and

BM ⊥ AC, DN ⊥ AC



Answer:

ar (ABCD) = ar (ABC) + ar (ADC)

$$\begin{aligned}
 &= \frac{1}{2} (3 \times 22) + \frac{1}{2} (3 \times 22) \\
 &= 33 + 33 = 66 \text{ cm}^2
 \end{aligned}$$