



# MATHS

## BOOKS - ICSE

### AREA OF A TRAPEZIUM AND A POLYGON

#### Example

1. Find the area of triangle whose sides are 9 cm, 12cm and 15 cm. Also, find the length of

altitude corresponding to the largest side of the triangle.



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2. Find the area of an equilateral triangle, whose one side is a cm.



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3. The base of an isosceles triangle is 12 cm and its perimeter is 32 cm. Find the area of the

triangle.



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4. The perimeter of a rectangle is 28 cm and its length is 8cm. Find its:

(i) breadth (ii) area (iii) diagonal



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5. The area of a rectangle is  $5.4m^2$ . If its breadth is 1.5 m, find its :

(i) length (ii) Perimeter



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**6.** The perimeter of a square is 28 cm. Find its:

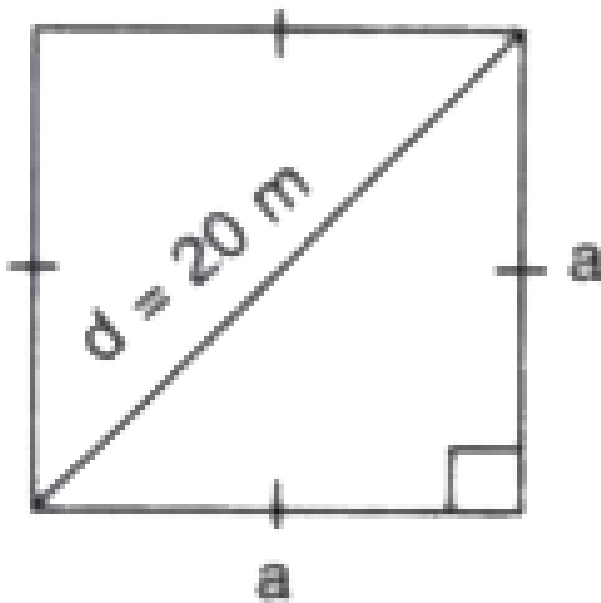
(i) one side (ii) area (iii) diagonal



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**7.** The diagonal of a square is 20m. Find its:

(i) area (ii) length of one side (iii) perimeter



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8. A path of uniform width 4 m runs around the outside of a rectangular field 24 m by 18m. Find the area of the path.



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**9.** A path of uniform width 2m runs around the inside of a square field of side 20m. Find the area of the path.



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**10.** A rectangular hall is 5.25 long and 3.78 m wide. Its floor is to be covered with square

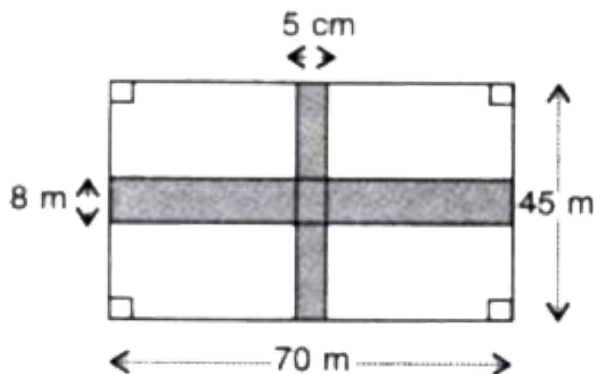
tiles, each of side 21 cm. Find the cost of tiles required at the rate of Rs. 5 per tile.



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**11.** The adjoining figure shows a rectangular field 70m long and 45 m wide. The shaded portion shows two mutually perpendicular roads, one of width 5 m and the other with width 8 m. Find the cost of levelling the roads

at the rate of Rs. 180 per sq. m.



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**12.** The lengths of parallel sides of a trapezium are in the ratio 3:5 and the distance between them is 10cm. If the area of the trapezium is  $120\text{cm}^2$ , find the lengths of its parallel sides.



A.  $9\text{cm}$  and  $17\text{cm}$

B.  $8\text{cm}$  and  $15\text{cm}$

C.  $9\text{cm}$  and  $15\text{cm}$

D.  $5\text{cm}$  and  $17\text{cm}$

**Answer: C**



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**13.** The area of a trapezium is  $880\text{cm}^2$ . The lengths of the parallel sides are  $60\text{ cm}$  and  $28$

cm respectively. Find the distance between the parallel sides.



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**14.** The area of a trapezium shaped field is  $1920m^2$ , the height is 30 and one of the parallel sides is 40 m. Find the other parallel side.



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**15.** The area of the trapezium is  $210 \text{ cm}^2$  and its height is 14 cm. If one of the parallel sides is longer than the other by 6 cm, find the two parallel sides.



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**16.** The perimeter of a trapezium is 52 cm and its non-parallel sides are 9 cm and 11 cm respectively. If its height is 8 cm. find the area of trapezium.





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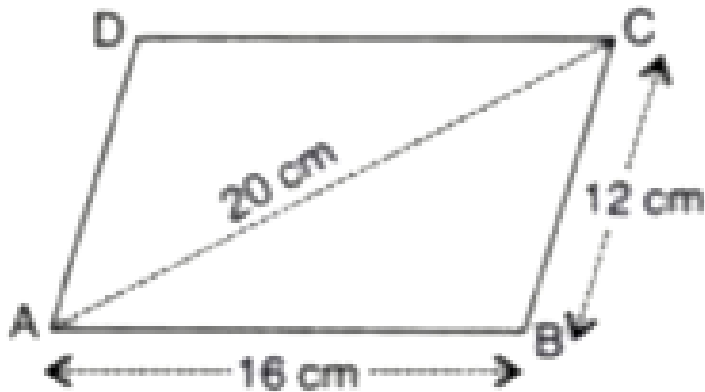
**17.** A parallelogram has sides of 12 cm and 8 cm. If the distance between the 12 cm sides is 5 cm, find the distance between 8 cm sides.



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**18.** In parallelogram ABCD,  $AB = 16$  cm,  $BC = 12$  cm and diagonal  $AC = 20$  cm. Find the area of

the parallelogram.



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**19.** The diagonals of a rhombus are 16 cm and 12 cm, find:

(i) its area (ii) length of its side (iii) its perimeter.



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20. Find radius and area of a circle whose circumference is 132 cm.



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21. Find circumference of the circle, whose area is  $24.64 \text{ m}^2$ .



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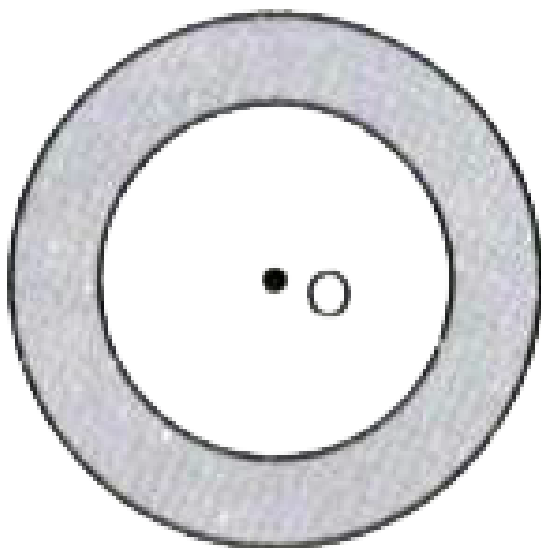
**22.** The perimeter of a square, whose each side is 22 cm, is the same as circumference of a circle. Find the area of the circle.



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**23.** The shaded portion in the adjoining figure shows a circular path enclosed by two concentric circles. If the inner circumference of the path is 176 m and the uniform width of the

circular path is 3.5 m, find the area of the path.



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**Exercise 20 A**



1. Find the area of of a triangle, whose sides are :

10 cm, 24 cm and 26 cm



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2. Find the area of a triangle, whose sides are :

18 mm, 24 mm and 30 mm



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**3.** Find the area of of a triangle, whose sides are :

21 m, 28 m and 35 m



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**4.** Two sides of a triangle are 6 cm and 8 cm. If height of the triangle corresponding to 6 cm side is 4 cm, find :

(i) area of the triangle

(ii) height of the triangle corresponding to 8 cm side.



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5. The sides of a triangle are 16 cm, 12 cm and 20 cm. Find :

(i) area of the triangle

(ii) height of the triangle, corresponding to the largest side

(iii) height of the triangle, corresponding to the smallest side.



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6. Two sides of a triangle are 6.4 m and 4.8 m.

If height of the triangle corresponding to 4.8 m side is 6 m, find :

(i) area of the triangle,

(ii) height of the triangle corresponding to 6.4 m side



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7. The base and the height of a triangle are in the ratio 4: 5. If the area of the triangle is  $40 m^2$ , find its base and height.



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8. The base and the height of a triangle are in the ratio 5:3. If the area of the triangle is  $67.5 m^2$ , find its base and height.



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9. The area of an equilateral triangle is  $144\sqrt{3}cm^2$ , find its perimeter.



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10. The area of an equilateral triangle is numerically equal to its perimeter. Find its perimeter correct to 2 decimal places.



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**11.** A field is in the shape of a quadrilateral ABCD in which side  $AB = 18$  m, side  $AD = 24$  m, side  $BC = 40$  m,  $DC = 50$  m and angle  $A = 90^\circ$ . Find the area of the field.



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**12.** The lengths of the sides of a triangle are in the ratio  $4:5:3$  and its perimeter is  $96$  cm. Find its area.



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**13.** One of the equal sides of an isosceles triangle is 13 cm and its perimeter is 50 cm. Find the area of the triangle.



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**14.** The altitude and the base of a triangular field are in the ratio 6:5. If its cost is Rs. 49,57,200 at the rate of Rs. 36,720 per hectare and 1 hectare = 10,000 sq. m, find (in metre) dimensions of the field.



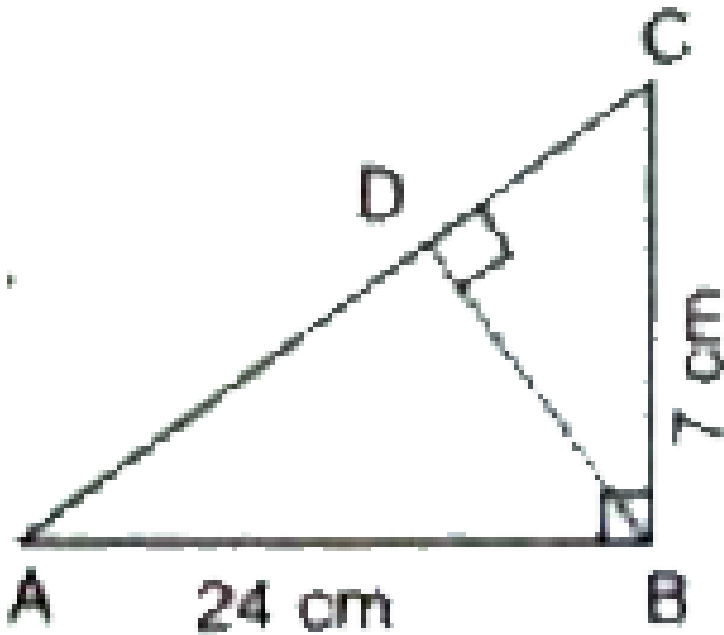


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**15.** Find the area of the right-angled triangle with hypotenuse 40 cm and one of the other two sides 24 cm.



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16.

Use the information given in the adjoining figure to find :

- (i) the length of  $AC$ .
- (ii) the area of  $\triangle ABC$ .

(iii) the length of BD, correct to one decimal place.



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## Exercise 20 B

1. Find the length and perimeter of a rectangle, whose area =  $120 \text{ cm}^2$  and breadth = 8 cm.



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2. The perimeter of a rectangle is 46 m and its length is 15 m. Find its :

(i) breadth

(ii) area

(iii) diagonal



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3. The diagonal of a rectangle is 34 cm. If its breadth is 16 cm, find its :

(i) length (ii) area



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4. The area of a small rectangular plot is  $84 \text{ m}^2$ . If the difference between its length and the breadth is 5 m, find its perimeter.



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5. The perimeter of a square is 36 cm, find its area.



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6. Find the perimeter of a square whose area is  $1.69 \text{ m}^2$ .



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7. The diagonal of a square is 12 cm long, find its area and length of one side.



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8. The diagonal of a square is 15 m, find the length of its one side and perimeter.



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9. The area of a square is  $169 \text{ cm}^2$ . Find its :

(i) one side (ii) perimeter



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**10.** The length of a rectangle is 16 cm and its perimeter is equal to the perimeter of a square with side 12.5 cm. Find the area of the rectangle.



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**11.** The perimeter of a square is numerically equal to its area. Find its area.



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**12.** Each side of a rectangle is doubled. Find the ratio between :

(i) perimeters of the original rectangle and the resulting rectangle

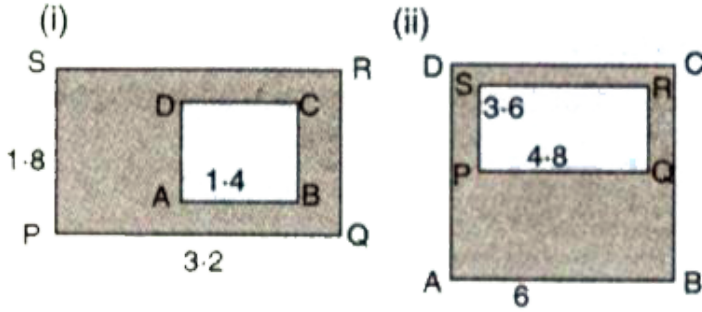
(ii) areas of the original rectangle and the resulting rectangle



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**13.** In each of the following cases ABCD is a square and PQRS is a rectangle. Find, in each case, the area of the shaded portion. (All

measurements are in metre).



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**14.** A path of uniform width, 3 m, runs around the outside of a square field of side 21 m. Find the area of the path.



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**15.** A path of uniform width, 2.5 m, runs around the inside of a rectangular field 30 m by 27 m. Find the area of the path.



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**16.** The length of a hall is 18 m and its width is 13.5 m. Find the least number of square tiles, each of side 25 cm, required to cover the floor of the hall,

(i) without leaving any margin.

(ii) leaving a margin of width 1.5 m all around.

In each case, find the cost of the tiles required at the rate of Rs. 6 per tile.



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**17.** A rectangular field is 30 m in length and 22 m in width. Two mutually perpendicular roads, each 2.5 m wide, are drawn inside the field so that one road is parallel to the length of the field and the other road is parallel to its width. Calculate the area of the crossroads.



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**18.** The length and the breadth of a rectangular field are in the ratio 5:4 and its area is  $3380 \text{ m}^2$ . Find the cost of fencing it at the rate of Rs. 75 per m.



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**19.** The length and the breadth of a conference hall are in the ratio 7:4 and its perimeter is 110m. Find:

(i) area of the floor of the hall.

(ii) number of tiles, each of rectangle of size  $25\text{cm} \times 20\text{cm}$ , required for flooring of the hall.

(iii) the cost of the tiles at the rate of Rs. 1,400 per hundred tiles.



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## Exercise 20 C

1. The following figure shows the cross-section ABCD of a swimming pool which is a trapezium

in shape.



If the width DC, of the swimming pool is 6.4 m, depth (AD) at the shallow end is 80 cm and depth (BC) at the deepest end is 2.4 m, find its area of cross-section.



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2. The parallel sides of a trapezium are in the ratio 3:4. If the distance between the parallel sides is 9 dm and its area is  $126 \text{ dm}^2$ , find the lengths of its parallel sides.



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3. The two parallel sides and the distance between them are in the ratio 3:4:2. If the area of the trapezium is  $175 \text{ cm}^2$ , find its height.







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4. A parallelogram has sides of 15 cm and 12 cm. If the distance between the 15 cm sides is 6 cm, find the distance between 12 cm sides.



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5. A parallelogram has sides of 20 cm and 30 cm. If the distance between its shorter sides is 15 cm, find the distance between the longer sides.



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6. The adjacent sides of a parallelogram are 21 cm and 28 cm. If its one diagonal is 35 cm, find the area of the parallelogram.



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7. The diagonals of a rhombus are 18 cm and 24 cm. Find ,

(i) its area (ii) length of its sides (iii) its perimeter



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**8.** The perimeter of a rhombus is 40 cm. If one diagonal is 16 cm, find :

(i) its other diagonal (ii) area



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9. Each side of a rhombus is 18 cm. If the distance between two parallel sides is 12 cm, find its area.



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10. The length of the diagonals of a rhombus is in the ratio 4:3. If its area is  $384 \text{ cm}^2$ , find its side.



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**11.** A thin metal iron-sheet is a rhombus in shape, with each side 10 m. If one of its diagonals is 16 m, find the cost of painting its both sides at the rate of Rs. 6 per  $m^2$ .

Also, find the distance between the opposite sides of this rhombus.



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**12.** The area of a trapezium is 279 sq. cm and the distance between its two parallel sides is 18 cm. If one of its parallel sides is longer than

the other side by 5 cm, find the lengths of its parallel sides.



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**13.** The area of a rhombus is equal to the area of a triangle. If base of triangle is 24 cm, its corresponding altitude is 16 cm and one of the diagonals of the rhombus is 19.2 cm, find its other diagonal.



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14. Find the area of the trapezium ABCD in which  $AB \parallel DC$ ,  $AB = 18$  cm,  $\angle B = \angle C = 90^\circ$ ,  $CD = 12$  cm and  $AD = 10$  cm.



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## Exercise 20 D

1. Find the radius and area of a circle, whose circumference is : 132 cm



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2. Find the radius and area of a circle, whose circumference is : 22 m



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3. Find the radius and circumference of a circle, whose area is :  $154 \text{ cm}^2$



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4. Find the radius and area of a circle, whose circumference is :  $6.16 \text{ m}^2$



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5. The circumference of a circular table is 88 m.  
Find its area.



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6. The area of a circle is 1386 sq. cm, find its circumference.



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7. Find the area of a flat circular ring formed by two concentric circles (circles with same centre) whose radii are 9 cm and 5 cm.



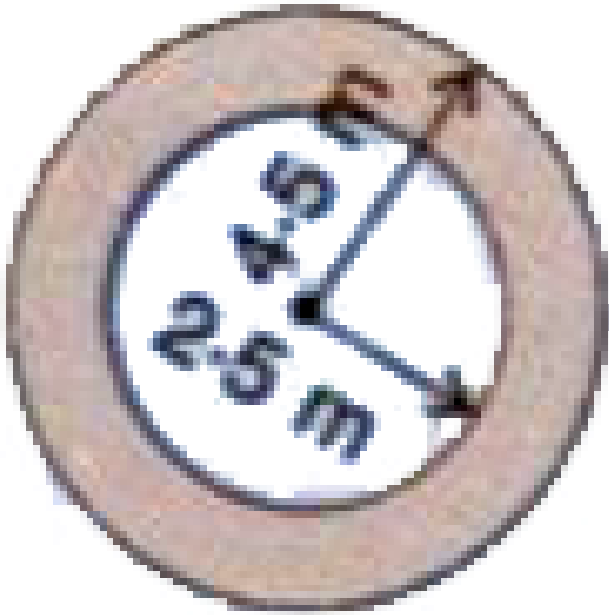
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8. Find the area of the shaded portion in each of the following diagrams :



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9. Find the area of the shaded portion in each of the following diagrams :



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**10.** The radii of the inner and outer circumferences of a circular-running-track are 63 m and 70 m respectively. Find :

(i) the area of the track

(ii) the difference between the lengths of the two circumferences of the track



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**11.** A circular field of radius 105 m has a circular path of uniform width of 5 m along and inside

its boundary. Find the area of the path.



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**12.** There is a path of uniform width 7 m round and outside a circular garden of diameter 210 m. Find the area of the path.



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**13.** A wire, when bent in the form of a square, encloses an area of  $484 \text{ cm}^2$ . Find :

(i) one side of the square

(ii) length of the wire

(iii) the largest area enclosed, if the same wire is bent to form a circle.



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**14.** A wire, when bent in the form of a square, encloses an area of  $196 \text{ cm}^2$ . If the same wire is bent to form a circle, find the area of the circle.



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**15.** The radius of a circular wheel is 42 cm. Find the distance travelled by it in:

(i) 1 revolution

(ii) 50 revolutions

(iii) 200 revolutions



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**16.** The diameter of the wheel of a car is 0.70 m. Find the distance covered by it in 500 revolutions.

If the wheel takes 5 minutes to make 500



revolutions, find its speed in :

(i) m/s (ii) km/hr



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**17.** A bicycle wheel, diameter 56 cm, is making 45 revolutions in every 10 seconds. Calculate the speed, in kilometre per hour, of the bicycle.



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**18.** A roller has a diameter of 1.4 m. Find :

(i) its circumference

(ii) the number of revolutions it makes while travelling 61.6 m.



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**19.** Find the area of the circle, length of whose circumference is equal to the sum of the lengths of the circumferences of circles with radii 15 cm and 13 cm.





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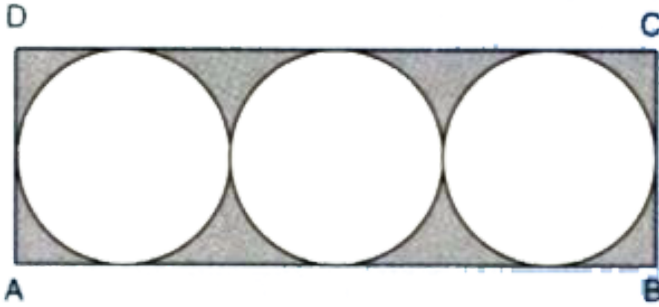
**20.** A piece of wire of length 108 cm is bent to form a semicircular arc bounded by its diameter. Find its radius and enclosed area.



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**21.** In the following figure, a rectangle ABCD encloses three circles. If  $BC = 14$  cm, find the

area of the shaded portion. (Take a  $\pi = 3\frac{1}{7}$ )



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