



MATHS

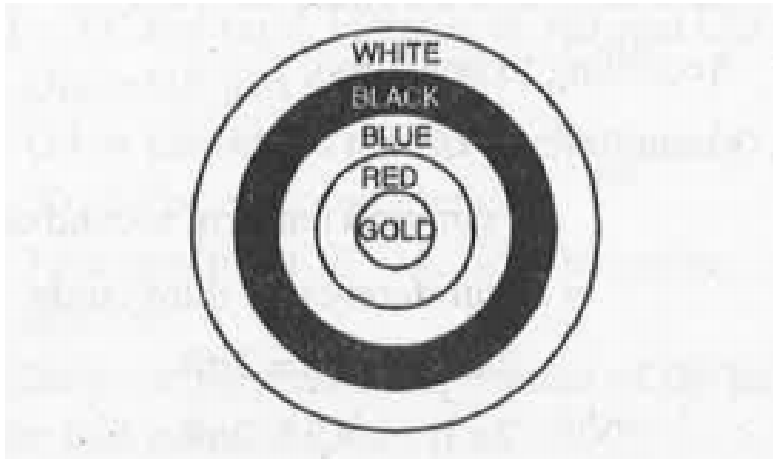
BOOKS - MBD

Areas of Plane Figures.

Example

1. Fig. depicts an archery target marked with its five scoring areas from the centre outwards as Gold, Red, Blue, Black and White. The

diameter of the region representing Gold score is 21 cm and each of the other bands is 10.5 cm wide. Find the area of each of the five scoring regions.



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2. The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour ?



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3. Tick the correct answer in the following and justify your choice : If the perimeter and area of a circle are numerically equal, then the radius of the circle is

A. 2 units

B. π units

C. 4 units

D. 7 units

Answer:



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4. Find the area of sector of a circle with radius 6 cm, if angle of the sector is 60° .



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5. Find the area of a quadrant of a circle whose circumference is 22 cm.



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6. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.



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7. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding : (i) minor segment (ii) major sector. (Use $\pi = 3.14$)



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8. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc



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9. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find area of the sector formed by the arc.



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10. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find area of the segment formed by the corresponding chord.



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11. A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the corresponding minor and major segments of the circle. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)



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12. A chord of a circle of radius 12 cm subtends an angle of 120° at the centre. Find the area

of the corresponding segment of the circle.

(Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)



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13. A car has two wipers which do not overlap.

Each wiper has a blade of length 25

cmsweeping through an angle of 115° . Find the

total area cleaned at each sweep of the blades.



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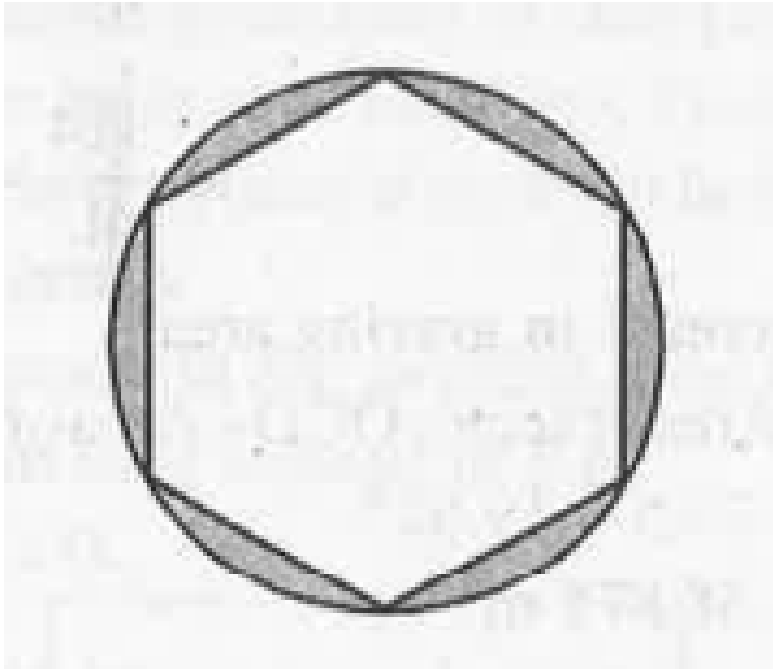
14. To warn ships for underwater rocks, a lighthouse spreads a red coloured light over a sector of angle 80° to a distance of 16.5 km. Find the area of the sea over which the ships are warned. (Use $\pi = 3.14$)



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15. A round table cover has six equal designs as shown in fig. If the radius of the cover is 28 cm, find the cost of making the designs at the

rate of ? $0.35 \text{ per } \text{cm}^2$. (use $\sqrt{3} = 1.7$)



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16. Tick the correct answer in the following:

Area of a sector of angle p° of a circle with

radius R is

A. $\frac{p}{180} \times 2\pi R$

B. $\frac{p}{180} \times \pi R^2$

C. $\frac{p}{360} \times 2\pi R$

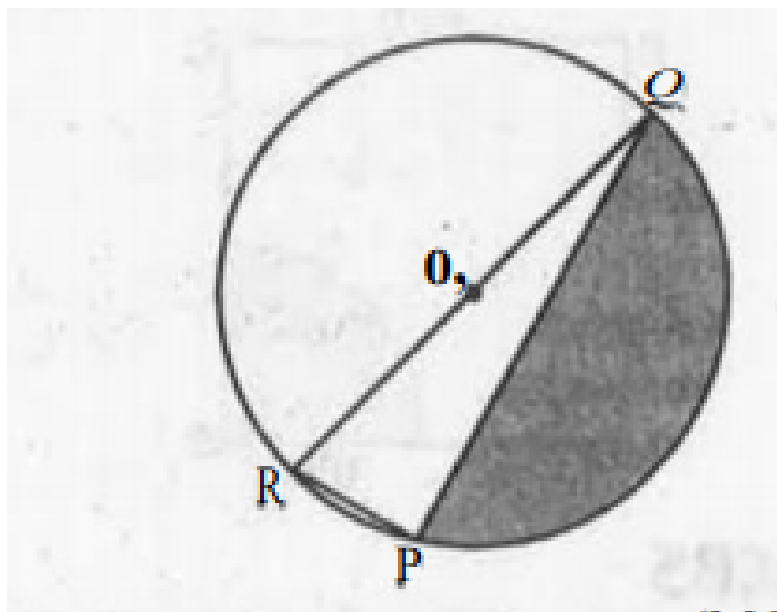
D. $\frac{p}{720} \times 2\pi R^2$

Answer:



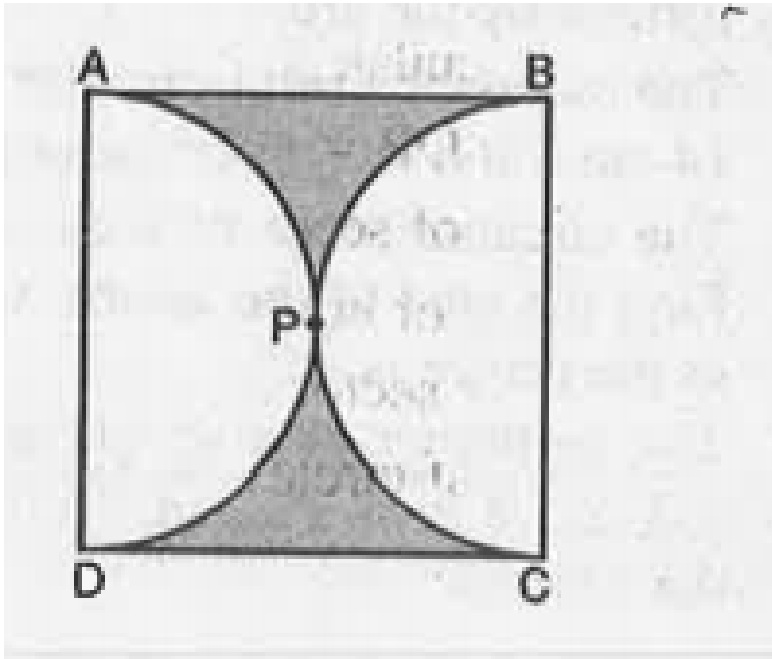
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17. Find the area of the shaded region in Fig., if $PQ = 24$ cm, $PR = 7$ cm and O is the centre of the circle.



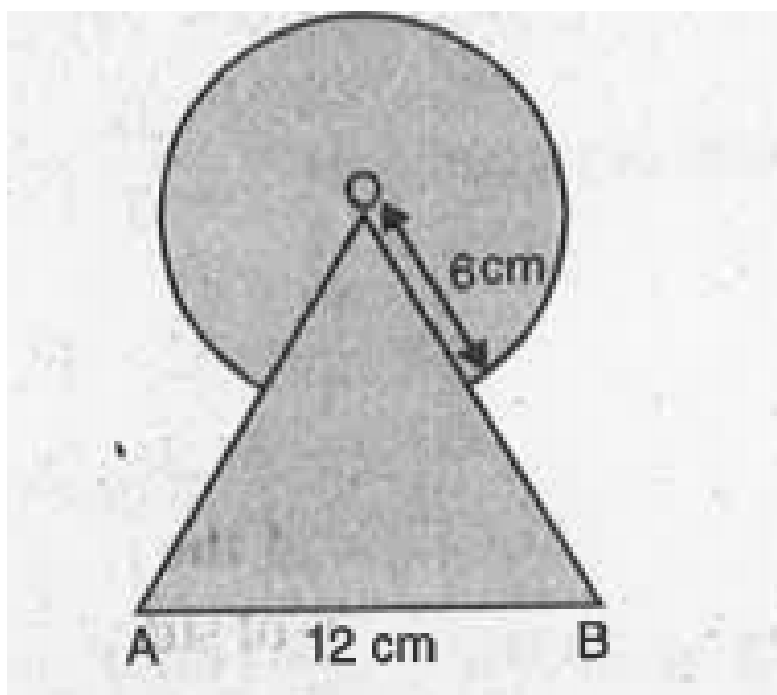
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18. Find the area of the shaded region in fig, if ABCD is a square of side 14 cm and APD and BPC are semicircles.



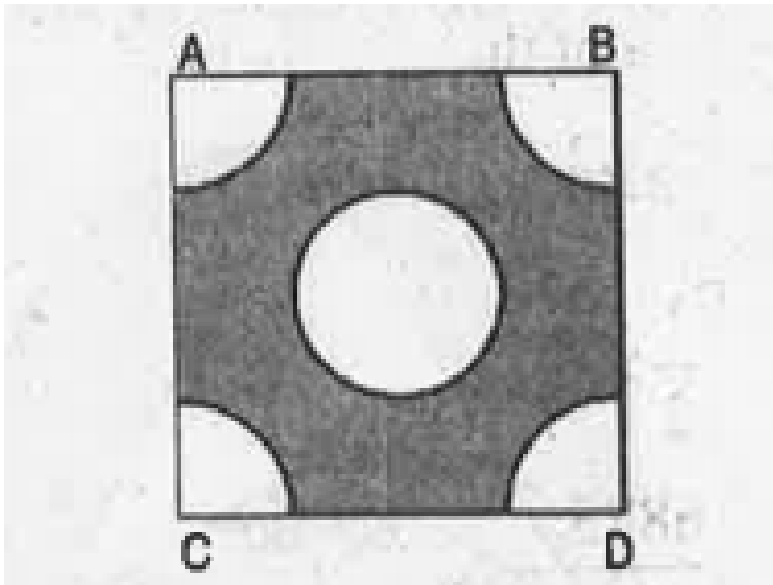
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19. Find the area of the shaded region in fig., where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.



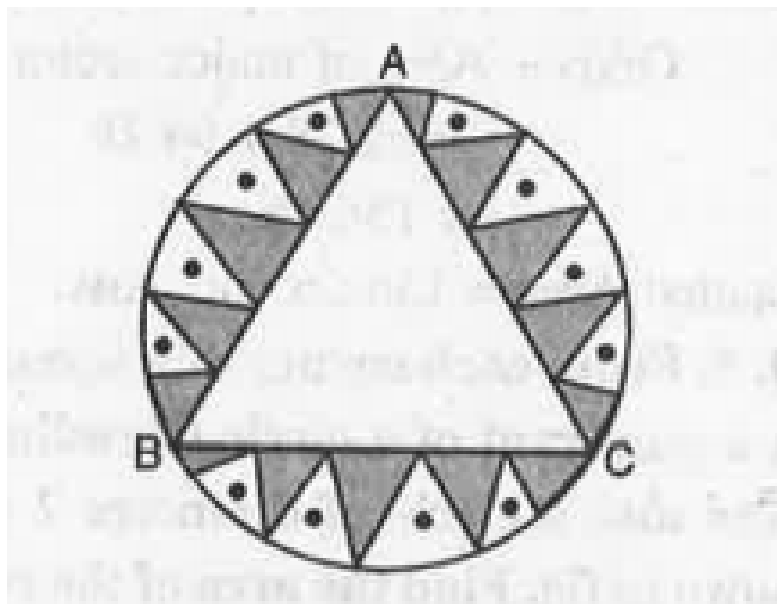
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20. From each corner of a square of side 4 cm a quadrant of a circle of radius 1 cm is cut and also a circle of diameter 2 cm is cut as shown in fig. Find the area of the remaining portion of the square.



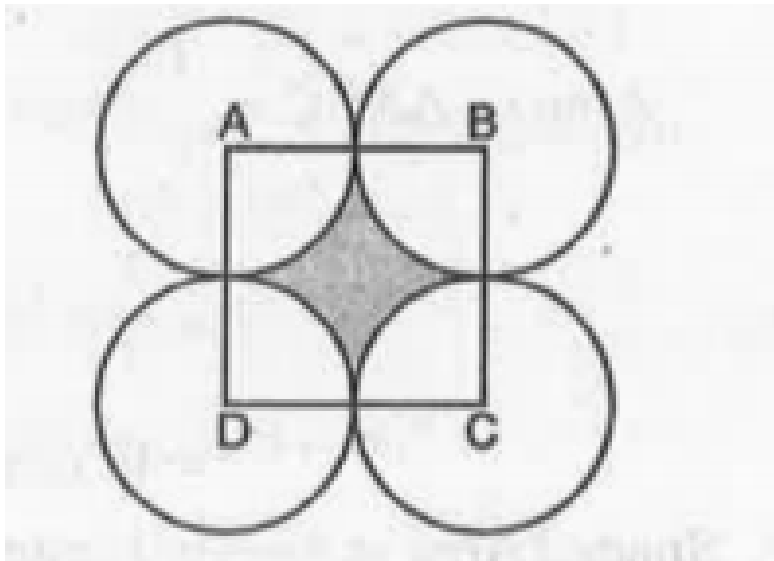
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21. In a circular table cover of radius 32cm, a design is formed leaving an equilateral triangle ABC in the middle as shown in fig. Find the area of the design (shaded region).



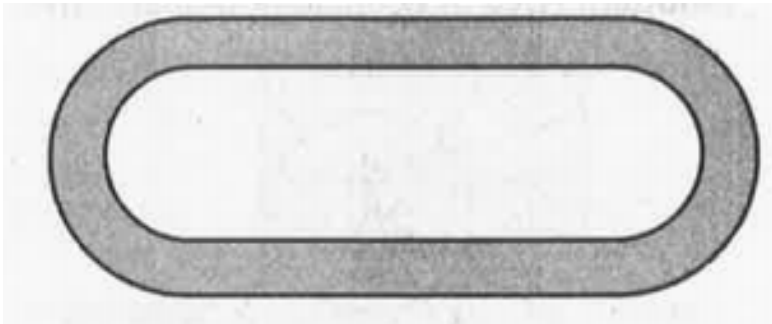
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22. In fig., ABCD is a square of side 14 cm. With centres A, B, C and D, four circles are drawn such that each circle touch externally two of the remaining three circles. Find the area of the shaded region.



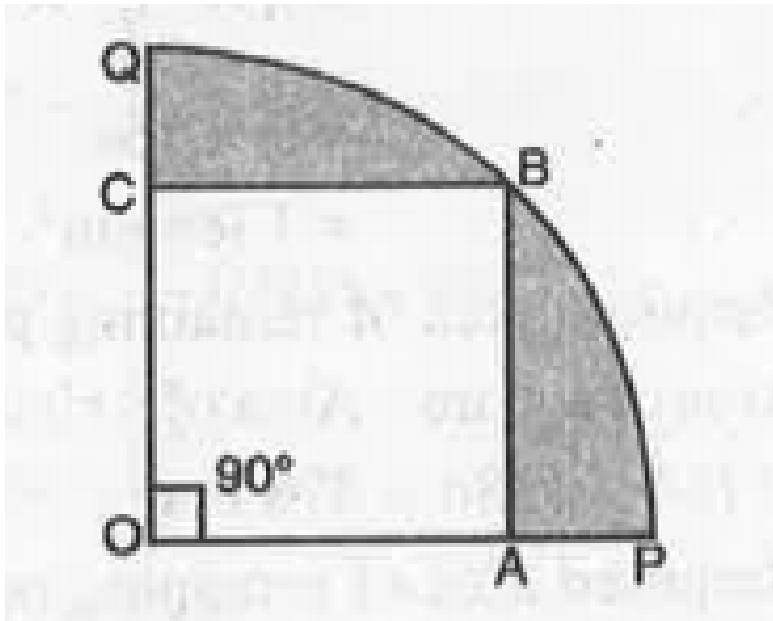
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23. Fig. depicts a racing track whose left and right ends are semicircular. The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide, find the distance around the track along its inner edge and the area of the track.



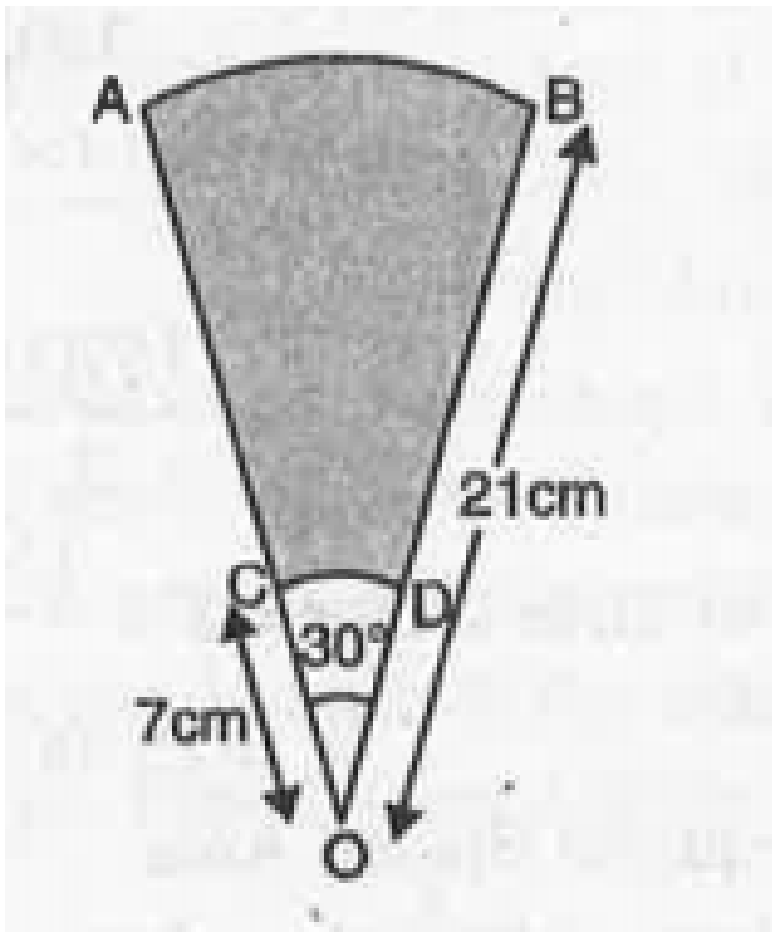
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24. In fig., a square OABC is inscribed in a quadrant OPBQ. If $OA = 20$ cm, find the area of the shaded region.



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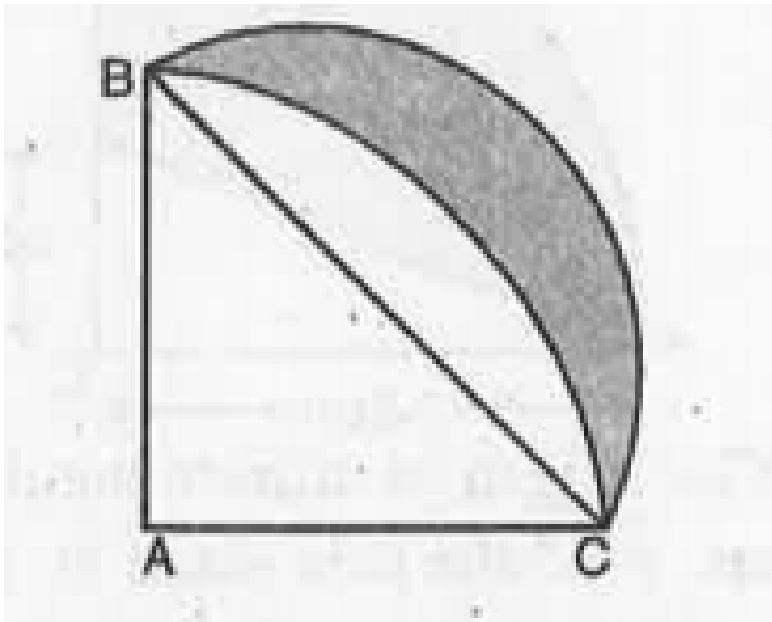
25. AB and CD are respectively arcs of two concentric circles of radii 21 cm and 7 cm and centre O. If $\angle AOB = 30^\circ$, find the area of the shaded region.





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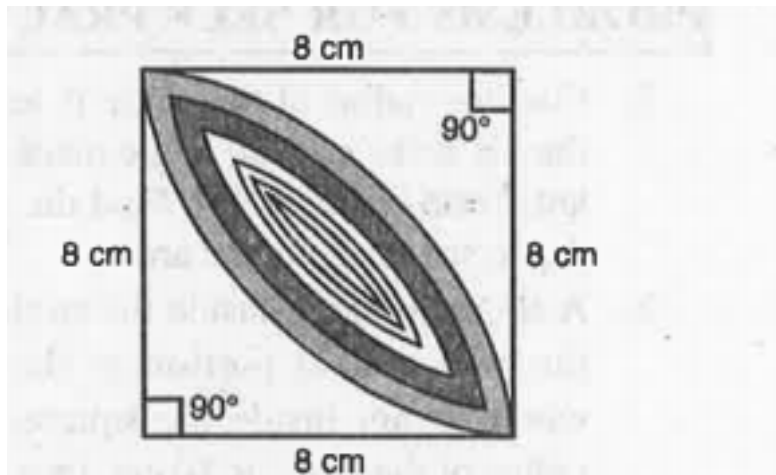
26. In fig., ABC is a quadrant of a circle of radius 14 cm and a semi circle is drawn with BC as diameter. Find the area of the shaded region.





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27. Calculate the area of the designed region in fig. common between the two quadrants of circles of radius 8 cm each.



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28. Write the formula for finding the area of the sector of a circle with angle θ .



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29. Write the formula to find the length of the arc of a sector with angle at centre is θ .



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30. Diameter is the largest chord of the circle.

(True/False)



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31. Circumference of a circle with radius r will be $2\pi^2$ (True/False)



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32. Area of a circle with radius r will be $2\pi r$ (True/False)



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33. Area of a circle with radius r will be $2\pi r^2$.

(True/False)



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34. Circumference of a circle with radius r will be $2\pi r$. (True/ false)



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35. Area of sector of angle p (in degrees) of a circle with Radius R is :



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36. Write the formula for circumference of circle with radius r .



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37. Write the formula for area of a circle.



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Exercise

1. A bicycle wheel makes 500 revolutions in moving 11 km. Find the diameter of the wheel.



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2. The area of a circle is equal to the sum of the areas of the two circles, whose radii are 5

cm and 12 cm respectively. Find the radius of the circle.



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3. The diameters of two circles are in the ratio of 4 : 3 and the sum of their areas is equal to the area of the circle, whose radius is 5 cm. Find the diameters of the two circles.



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4. The circumference of a circle is numerically equal to its area. Show that the radius of the circle is 2 units.



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5. The area enclosed between two concentric circles is 770 sq. cm given that the radius of the outer circle is 21 cm. Find the radius of the inner circle.



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6. The circumference of a circle exceeds its diameter by 30. Find the circumference of the circle.



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7. The cost of mowing the grass inside of circular lawn at the rate of `Rs 0.50 per m² is Rs 308. Find the cost of fencing the lawn at the rate of Rs 16 per metre.



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8. A wire is in the form of a circle with diameter 21 cm. It is cut and bent into a square. Find the area of the square.



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9. Two circles of radii 15 cm and 8 cm touch each other internally. Find the circumference, area of the circle drawn on the line joining their centres as the diameter.



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10. The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having area equal to the sum of areas of the two circles.



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11. A road, which is 7 m wide surrounds a circular path whose circumference is 352 metres. Find (a) the area of the path (b) the

cost of leveling the path at the rate of ? 2.50
per sq. m.



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12. A chord of a circle of radius 12 cm subtends an angle of 120° at the circle. Find the areas of corresponding minor and major segment of the circle.



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13. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find (i) the length of arc (ii) area of the sector formed by arc (iii) area of the minor segment formed by the arc.



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14. The radius of a semi-circular protractor is 14 cm. Find its perimeter and area.



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15. The circumference of a circle is 88 cm. Find the area of the sector, whose angle at the centre is 45° .



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16. The perimeter of a sector of a circle of radius 5.8 m is 27.2 m. Find the area of the sector.



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17. A chord of a circle of radius 21 cm subtends an angle of 120° at the centre. Find the area of the minor segment and the major segment



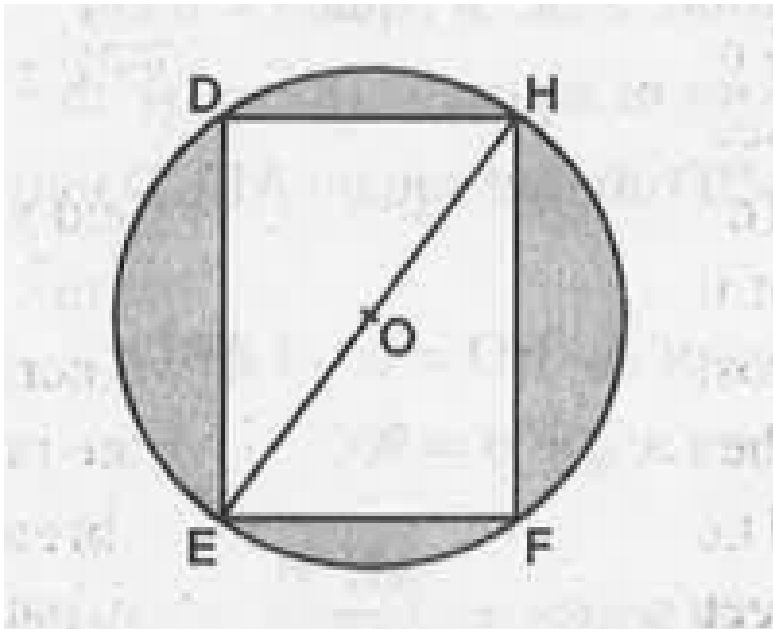
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18. Find the radius of the circle if length of the arc is 4π cm and angle made by the arc at the centre is 40° . Find the area of the sector made by the arc.



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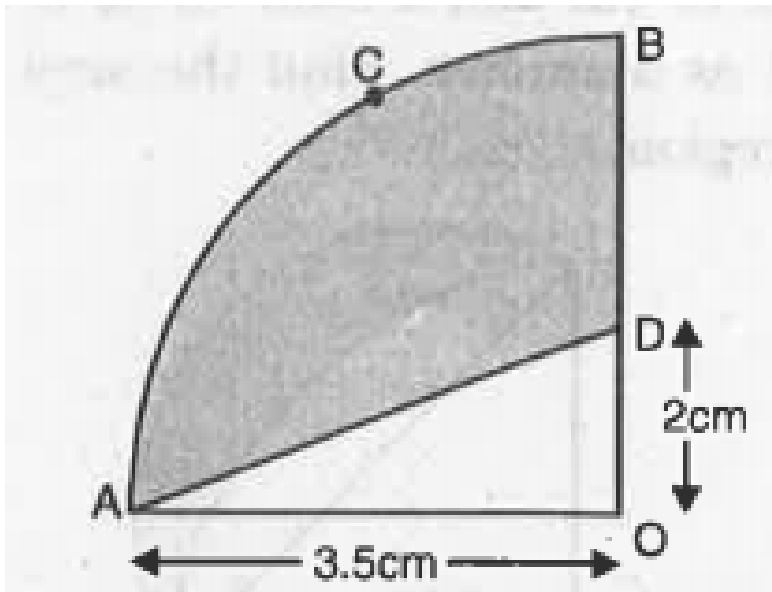
19. A square is made inside the circle. Find the area of that portion of the circle which is not inside the square, if the radius of the circle is 10 cm. ($\pi = 3.14$)



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20. In the fig. fourth quadrant of a circle is OACB where O is the centre of the circle and radius of the circle is 3.5 cm. Find the area of fourth quadrant of the circle. and find the area of shaded portion of the part ADBC if OD=2cm

$$\left(\pi = \frac{22}{7} \right)$$





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21. The length of minute hand clock is 10 cm. Find the area made by minute hand clock within time 9 : 00 to 9 : 35.



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22. Two concentric circles have radii 20 cm and 15 cm. Find the area of ring shaped region



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23. Area of an equilateral triangle is 17300 cm^2 . By taking each vertex of the triangle as centre, a circle is drawn at each vertex. The radius of the circle is half of the length of the side of an equilateral triangle. Find the area of that portion of the triangle which is not included in the circle. ($\pi = 3.14$ and $\sqrt{3} = 1.73$)



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24. Find the perimeter of the circle whose area is 6.16 cm^2 .



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25. Find the area of the circle whose perimeter is equal to the perimeter of the square with side 11 cm.



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26. When a wire is bent into a square then it covers the area of 121 cm^2 . When the wire is bent into a circle, then find the area of the circle.



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27. A piece of paper is in the form of rectangle ABCD in which $AB=18\text{cm}$, $BC=14 \text{ cm}$. With BC as the diameter, a semicircle portion of the paper

is cut .Find the area of the rest of the piece of paper.



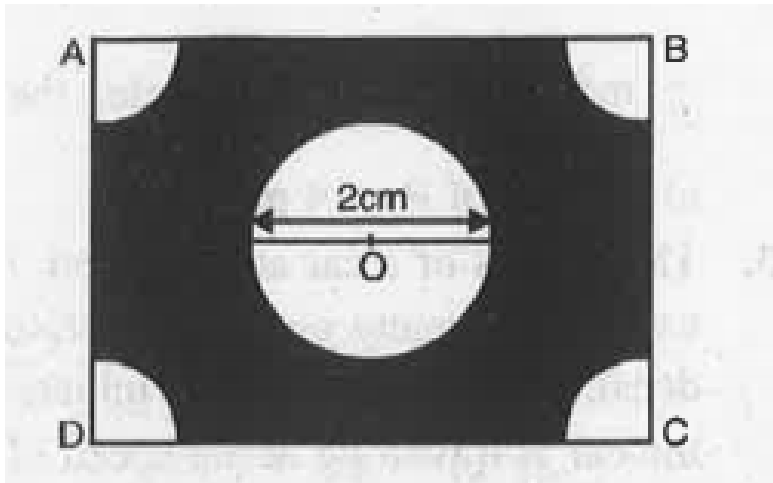
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28. The area covered by two concentric circles is 770 cm^2 . The outer radius is 21 cm. Find the inner radius of circle.



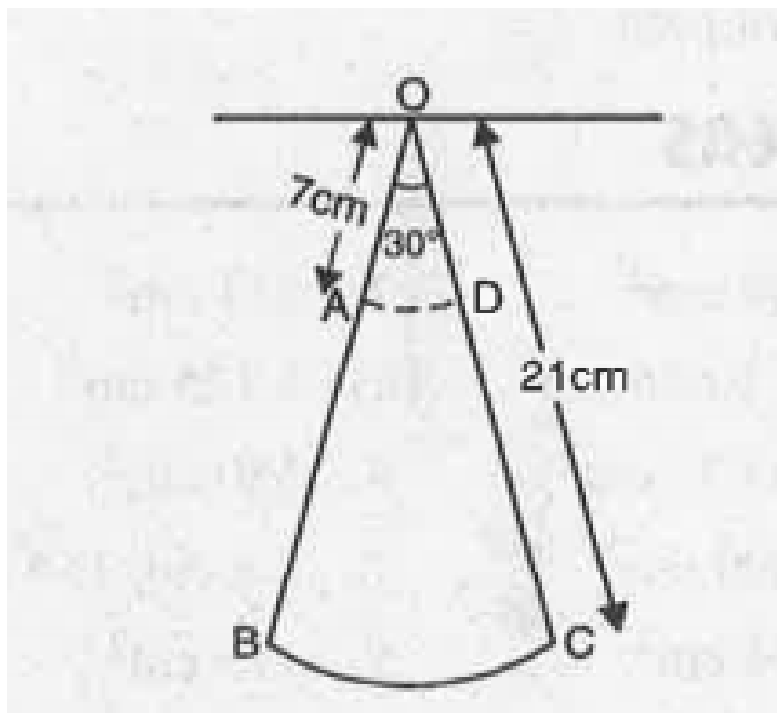
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29. ABCD is a square of side 4 cm. With every corner as the centre, quadrant of a circle is drawn and at the centre a circle of 1 cm radius is drawn as shown in figure. Find the area of shaded portion.



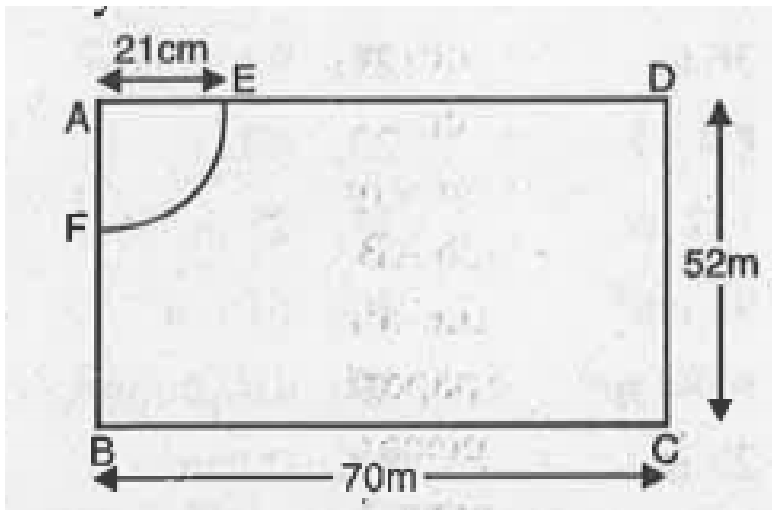
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30. In the figure, the shaded portion shows the area cleaned by the wiper of the car. Find the area cleaned by the wiper of the car is $OA = 7$ cm and $OB = 21$ cm. ($\pi = \frac{22}{7}$).



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31. A horse is tethered to graze the grass at one corner of a rectangular park. The measurement of the park is $70m \times 52m$. The length of the rope with which horse is tied of length $21m$. Find the area grazed by the horse.



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32. There are 64 equal squares in the chess board and every Square has area 6.25 cm^2 . There is a border of width 2 cm at each of its four sides. Find the length of the side of chess board.



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33. A horse is tethered to one corner of a rectangular field of dimensions 70 m by 52 m with a rope of length 28 m. Find out the area grazed by the horse.



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34. A sheet of paper is in the form of a rectangle ABCD in which $AB = 40$ cm and $AD = 28$ cm. With BC as the radius a semicircular portion of the sheet is to be cut. Find the area of the rest of the portion.



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35. A playground is in the form of a rectangle whose both sides are taken as radius and two semicircles are drawn, which are added to its outer sides. If the sides of rectangle are 36 m and 24.5 m, then find the area of playground.



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36. The length of minute hand clock is 14 cm. Find the area covered by the minute hand clock in one minute.





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37. The radius of the circle is 14 m. Find the radius of another circle whose area is one-fourth of the area of previous circle.



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38. The diameter of a semi circular protector is 14 cm. Find its perimeter



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39. A wire is in the form of a circle of radius 42 cm. It is converted into a square. Find the side of the square.



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40. A mirror is fitted into four circular windows of radius 28 cm. Find the cost of fitting the mirror at the rate of Rs. 4.25 per m^2



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41. The area of a rectangular floor of side 40 m is 960 m^2 . The carpets of size $6\text{ m} \times 4 \text{ m}$ are available. How many carpets are needed to cover the floor.



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42. To cover the rectangular field with grass at the rate of 85 paise per m^2 , the total cost is Rs 625.75. Find the perimeter of the field if its sides are in the ratio 5:3. .



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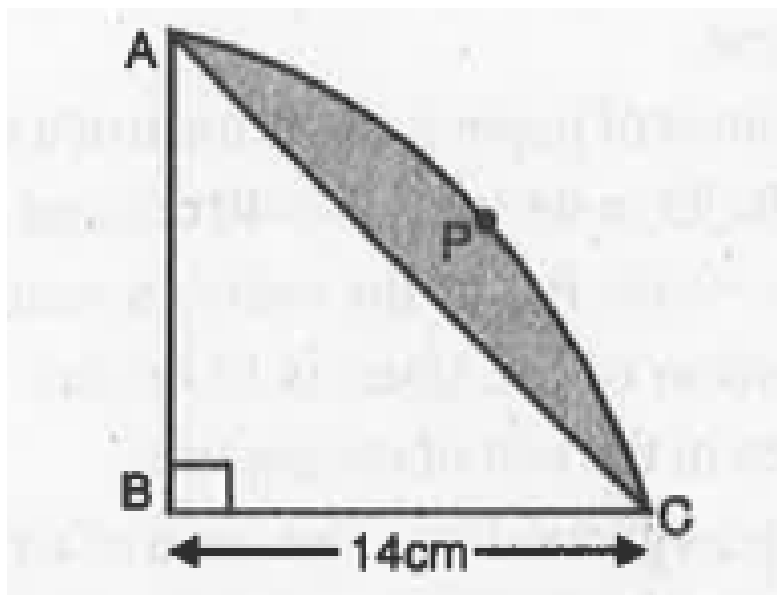
43. The ratio of length and breadth of a rectangular field is 7 : 4. A path of 4 m wide is there all round the rectangular field. Its area is 416 m^2 . Find the length and breadth of the field



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44. ABCP is one-fourth of the circle whose radius is 14 cm. Taking AC is diameter a semi

circle is drawn. Find the area of shaded portion.



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45. A copper wire is bent in the form of a square whose area is 484 m^2 . If the wire is

bent in the form of a circle, then what will be its area ?

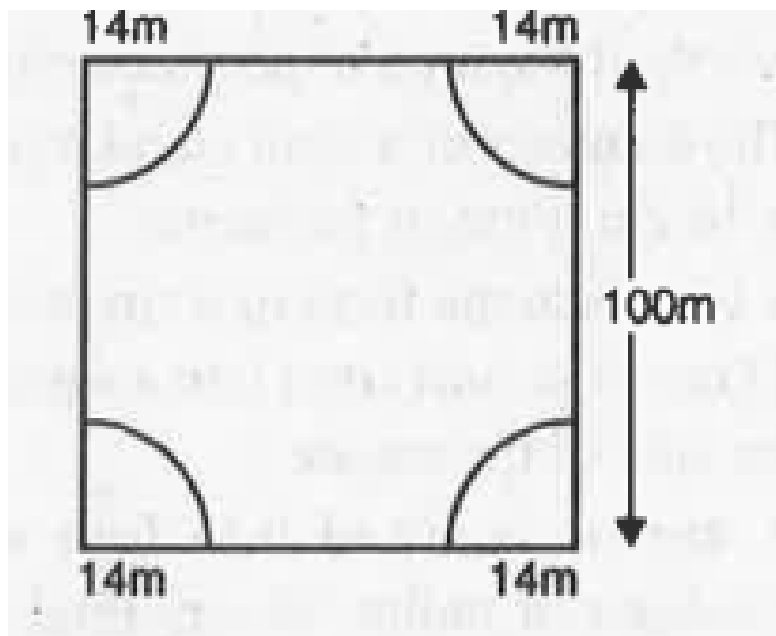


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46. Every side of a square park is 100 m wide.

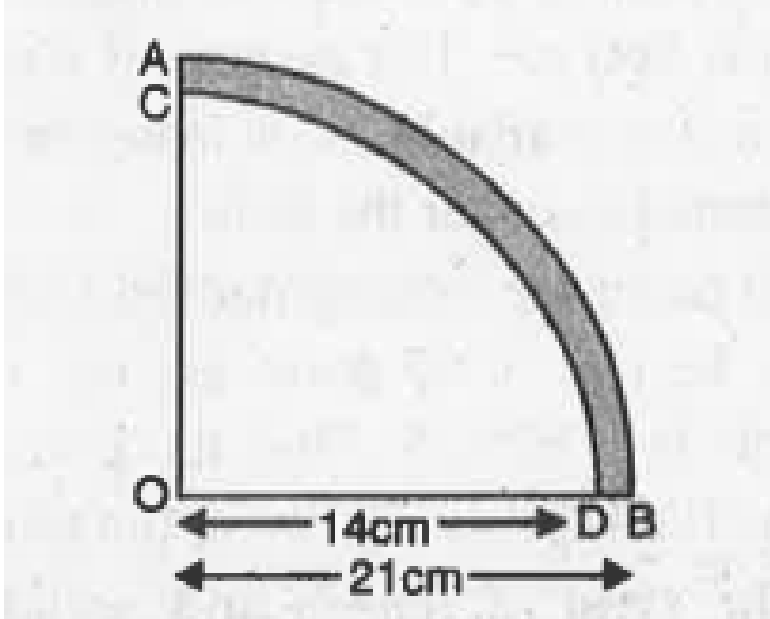
At every corner of the park a flower bed of radius 14 m is made in the form of quadrant of

a circle. Find the area of the rest of the park.



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47. ABCD is a flower bed. If $OA = 21$ m and $OC = 14$ m, then find the area of flower bed.



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48. The radii of two circles are 16 cm and 12 cm respectively. Find the radius of circle which has area equal to sum of the areas of two circles.



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49. The area of field which is circular is $3218\frac{2}{7}m^2$. Find the cost of fencing the field at the rate of Rs. 14 per metre



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50. The wheels of a car are diameter 70 cm each. How many complete revolutions does each wheel make in oneminute when the car is travelling at the speed of 52.8 km per hour.



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51. Circular foot path of 2 metres is constructed at the rate of Rs. 20 per m^2 around a circular park of radius 1500 m. Find the total cost of construction of the foot path.



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