MATHS

BOOKS - NCERT MATHS (ENGLISH)

AREAS RELATED TO CIRCLE

Multiple Choice Questions

1. If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R, then

A. $R_1 + R_2 = R$

B. $R_1^2 + R_2^2 = R^2$

C. $R_1 + R_2 < R$

D. $R_1^2 + R_2^2 < R^2$

Answer: B

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2. If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R, then

A. $R_1 + R_2 = R$

B. $R_1 + R_2 > R$

C. $R_1 + R_2 < R$

D. Nothing definite can be said about the relation among R_1, R_2 and R.

Answer: A

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3. If the circumference of a circle and the perimeter of a square are equal, then

A. Area of the circle = Area of the square

B. Area of the circle $>$ Area of the square

C. Area of the circle $<$ Area of the square

D. Nothing definite can be said about the relationship between the areas of the circle and square

Answer: B

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4. What is the area of the largest triangle that can be inscribed in a semicircle of radius r unit.

A. r^2 sq units

B. $\frac{1}{2}r^2$ sq units

C. $2r^2$ sq units

D. $\sqrt{2}r^2$ sq units

Answer: A

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5. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is

A. $22:7$

B. $14:11$

C. $7:22$

D. $11:14$

Answer: B

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6. If is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be

A. 10 m

B. 15 m

C. 20 m

D. 24 m

Answer: A

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7. The area of the circle that can be inscribed in a square of side 6 cm is

A. $36\pi cm^2$

B. $18\pi cm^2$

C. $12\pi cm^2$

D. $9\pi cm^2$

Answer: D

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8. The area of the square that can be inscribed in a circle of radius 8 cm is

A. 256 cm^2

B. 128 cm^2

C. $\sqrt{2}r^2$

D. 64 cm^2

Answer: B

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9. The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameters 36 cm and 20 cm is

A. 56 cm

B. 42 cm

C. 28 cm

D. 16 cm

Answer: C

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10. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is

A. 31 cm

B. 25 cm

C. 62 cm

D. 50 cm

Answer: D

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Very Short Answer Questions

1. Is the area of the circle inscribed in a square of side a cm, $\pi a^2 cm^2$? Give reasons for your answer.

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2. Will it be true to say that the perimeter of a square circumscribing a circle of radius a cm is 8a cm ? Give reson for your answer.

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3. In figure, a square is inscribed in a circle of diameter d and another square is circumscribing the circle . Is the area of the outer square four times the area of the inner square ? Give reason for your answer.

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4. Is it true to say that area of segment of a circle is less than the area of its corresponding sector? Why ?

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5. Is it true that the distance travelled by a cirular wheel of diameter d cm in one revolution is $2\pi d$ cm ? Why ?

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6. In covering a distance s m, a circular wheel of radius r m makes $\frac{s}{2\pi r}$ revolution. Is this statement trus ? Why ?

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7. The numerical value of the area of a circla is greater than the numerical value of its circumference. Is this statement true ? Why ?

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8. If the length of an arc of a circle of radius r is equal to that of an arc of a circle of radius 2r, then the angle of the corresponding of the other circle. Is this statement false ? Why ?

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9. The area of two sectors of two sectors of two different circles with equal corresponding

arc lengths are equal. Is this statement trus ? Why ?

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10. The areas of two sectors of two different circles are equal. Is it necessary that their corresponding arc lengths are equal ? Why ?

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11. Is the area of the largest circle that can be drawn inside a rectangle of length $a\ cm$ and breadth $b\ cm\ (a > b)$ is $\pi b^2\ cm^2$? Why ?

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12. Circumference of two circles are equal. Is it necessary that their areas be equal ? Why ?

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13. Areas of two circles are equal. Is it necessary that their circumferences are equal ? Why ?

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14. Is it true to say that area of square inscribed in a circle of diameter $p\,cm$ is $p^2 cm^2$? Why ?

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Short Answer Type Questions

1. Find the radius of a circle whose circumference is equal to the sum of the circumference of two circles of radii $15\ cm$ and $18\ cm$.

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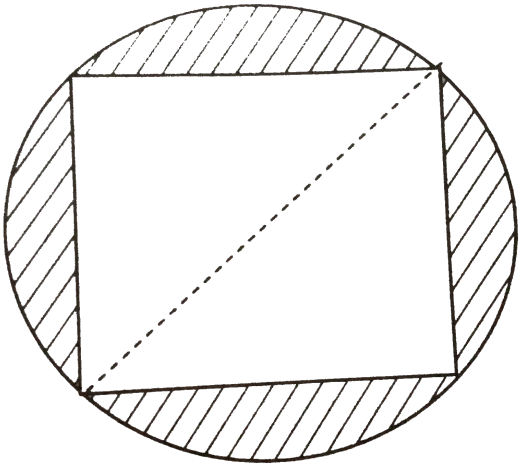
2. In figure, a square of diagonal $8\ cm$ is inscribed in a circle. Find the area of the

shaded region.



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3. Find the area of a sector of a circle of radius 28cm and central angle 45°.

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4. The wheel of a motor cycle is of radius 35 cm. How many revolutions per minute must the wheet make, so as to keep a speed of 66 km/h ?

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5. A cow is tied with a rope of length 14m at the corner of a rectangular field of dimensions $20m \times 16m$. Find the area of the field in which the cow can graze.

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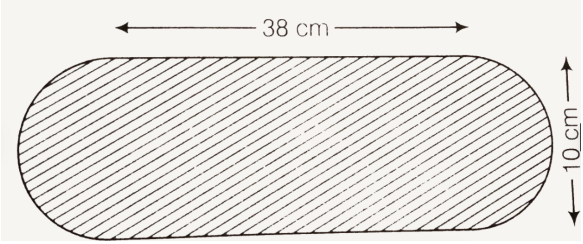
6. Find the area of the flower bed (with semi-circular ends) shown in figure.



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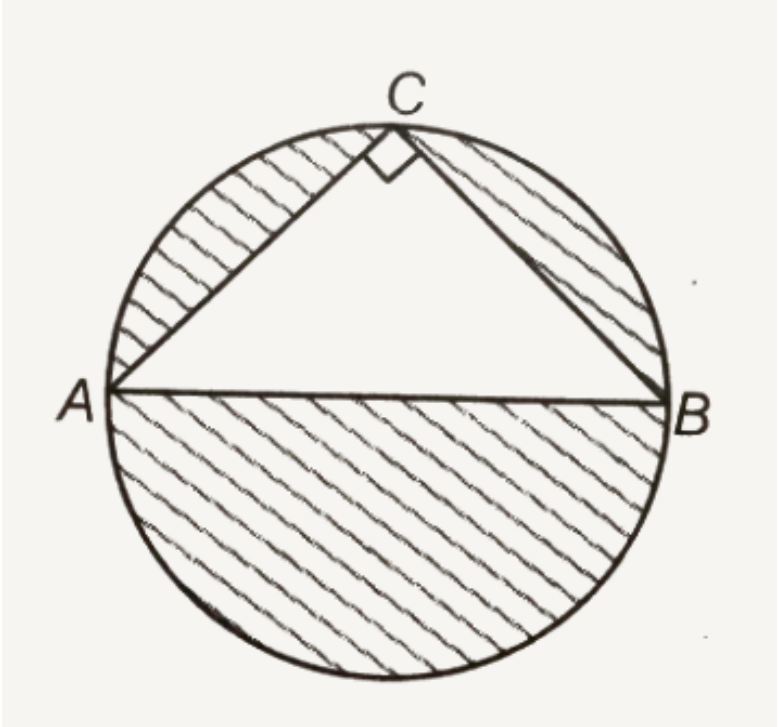
7. In figure , AB is a diameter of the circle, AC = 6cm and BC = 8cm . Find the area of the

shaded region . (use $\pi = 3.14$)



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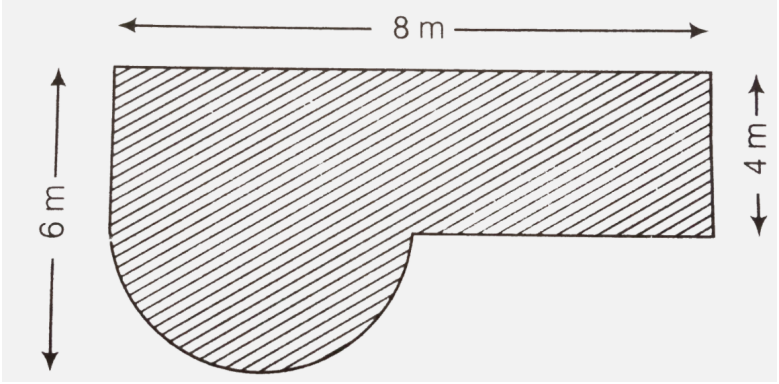
8. Find the area of the shaded field shown in figure.



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9. Find the area of the shaded region in figure.

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10. Find the area of the minor segment of a circle of radius 14cm, when the angle of the corresponding sector is 60°

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11. Find the area of the shaded region in figure, in figure, where arcs drawn with centres A, B, C and D intersect in pairs at mid-point P, Q, R and S of the sides AB, BC, CD and DA,

respectively of a square ABCD. (use $\pi = 3.14$)

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12. In figure arcs are drawn by taking vertices A, B and C of an equilateral triangle of side $10\ cm$, To intersect the sides BC, CA and AB at their respective mid- points D, E and F . Find the area of the shaded region. (use $\pi = 3.14$)

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13. In figure arcs have been drawn with radii 14 cm each and with centres P, Q and R. Find the area of the shaded region .

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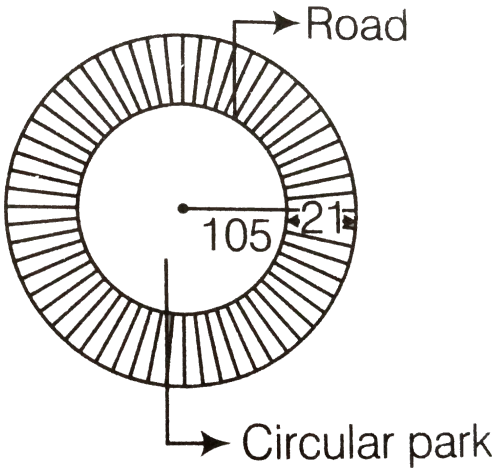
14. A circular park is surrounded by a road 21 m wide. If the radius of the park is 105 m, then

find the area of the road.



$[\because \text{area of circle} = \pi r^2]$

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15. In figure, arcs have been drawn of radius 21 cm each with vertices A,B,C and D of quadrilateral $ABCD$ as centres . Find the area

of the shaded region.

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16. A piece of wire $20\ cm$ long is bent into the form of an arc of a circle, subtending an angle of 60° at its centre. Find the radius of the circle.

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Long Answer Type Questions

1. The area of a circular playground is 22176 m^2 . Find the cost of fencing this ground at the rate of Rs. 50 per m.

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2. The diameters of front and rear wheels of a tractor are $80\ cm$ and $2\ m$, respectively. Find the number of revolutions that rear wheel will

make in covering a distance in which the front wheel makes 1400 revolutions .

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3. Sides of a triangular field are 15 m, 16m and 17m. With the three corners of the field a cow, a buffalo and a horse are tied separately with ropes of length 7m each to graze in the field. Find the area of the field which cannot be grazed by the three animals.

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4. Find the area of the segment of a circle of radius $12\ cm$ whose corresponding sector has a central angle of 60°. (use $\pi = 3.14$)

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5. A circular pond is of diameter $17.5\ m$. It is surrounded by a $2\ m$ wide path. Find the cost of constructing the path at the rate of $Rs.\ 25$ per square metre.

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6. In figure, ABCD is a trapezium with AB|| DC . AB = 18 cm, DC = 32 cm and distance between AB and DC= 14 cm. If arcs of equal radii 7 cm with centres A, B, C and D have been drawn, then find the area of the shaded region of the figure.

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7. In Figure 6, three circles each of radius 3-5 cm are drawn in such a way that each of them touches the other two. Find the area enclosed between these three circles (shaded region).

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8. Find the area of the sector of a circle of radius 5 cm, if the corresponding arc length is 3.5 cm.

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9. Four circular cardboard pieces of radii 7 cm are placed on a paper in such a way that each piece touches two pieces. Find the area of the portion enclosed between these pieces.

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10. On a square cardboard sheet of area $784cm^2$, four congruent circular plates of maximum size are placed such that each circular plate touches the other two plates

and each side of the square sheet is tangent to two circular plates. Find the area of the square not covered by the circular plates.

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11. Floor of a room is of dimensions $5m \times 4m$ and it is covered with circular tiles of diameters 50 cm each as shown infigure . Find area of floor that remains uncovered with tiles. (use $\pi = 3.14$)

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12. All the vertices of a rhombus lie on a circle. Find the area of the rhombus, if area of the circle is $1256cm^2$. (use $\pi = 3.14$)

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13. find of the An archery target has three regions formed by three concentric circles as shown in Fig 15.8. If the diameters of the concentric circles are in the ratio $1:2:3.$, then

find the ratio of the areas of three regions Fig. 15.8

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14. The length of the minute hand of a clock is 5cm. Find the area swept by the miute hand during the time period $6:05$ am and $6:40$ am.

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15. Area of a sector of central angle 200° of a circle is $770cm^2$. Find the length of the corresponding arc of this sector.

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16. The central angles of two sectors of circles of radii 7 cm and 21 cm are respectively $120^\circ \text{ and } 40^\circ$. Find the areas of the two sectors as well as the lengths of the corresponding arcs. What do you observe ?

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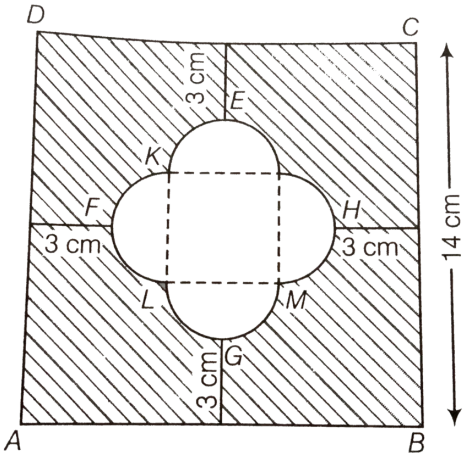
17. Find the area of the shaded region given in figure.



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18. Find the number of revolutions made by a circular wheel of area $1.54\ m^2$ in rolling a distance of $176\ m$.

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19. Find the differnce of the areas of two segments of a circle formed by a chord of length 5cm subtending an angle of 90° at the centre.

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20. Find the difference of areas of a sector of angle 120° and its corresponding major sector of a circle of radius 21cm.

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