MATHS

BOOKS - R G PUBLICATION

AREAS RELATED TO CIRCLES

Example

1. The length of the diameters of some circles are given below.Find the circumferences of each of them.(i)14 cm

2. The length of the diameters of some circles are given below.Find the circumferences of each of them.(ii)42 cm

3. The length of the diameters of some circles are given below.Find the circumferences of each of them.(iii)11 dm

4. The length of the diameters of some circles are given below.Find the circumferences of each of them.(iv)20 m

5. The length of the diameters of some circles are given below.Find the circumferences of each of them.(v)18 m

6. The length of the diameters of some circles are given below.Find the circumferences of each of them.(vi)25 m

7. The length of the diameters of some circles are given below.Find the circumferences of each of them.(vii)45 cm

8. The length of the diameters of some circles are given below.Find the circumferences of each of them.(viii)35 cm

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9. Find the circumferences of the circles whose radii are given below:(i)2.5 cm

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10. Find the circumferences of the circles whose radii are given below:(ii)1.5 cm

11. Find the circumferences of the circles whose radii are given below:(iii)0.5 m

12. Find the circumferences of the circles whose radii are given below:(iv)3.7 dm

13. Find the diameters of the circles whose circumferences are given below:(i)16 m

14. Find the diameters of the circles whose circumferences are given below:(ii) 68 m

15. Find the diameters of the circles whose circumferences are given below:(iii)110 m

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16. Find the diameters of the circles whose circumferences are given below:(iv)88 cm

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17. Find the radii of the circles whose circumferences are given below:(i)12.56 cm

18. Find the radii of the circles whose circumferences are given below:(ii)6.28 cm

19. Find the radii of the circles whose circumferences are given below:(iii)2200 cm

20. Find the radii of the circles whose circumferences are given below:(iv)308 m

21. Find the areas of the circles whose radii are given below:(i)14 m

22. Find the areas of the circles whose radii are given below:(ii) 9 m

23. Find the areas of the circles whose radii are given below:(iii) 49 cm

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24. Find the areas of the circles whose radii are given below:(iv)56 m

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25. Find the areas of the circles whose radii are given below:(v)21 cm

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26. Find the areas of the circles whose radii are given below:(vi)217 cm

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27. Find the areas of the circles whose diameters are given below:(i)20 cm

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28. Find the areas of the circles whose diameters are given below:(ii)9.8 cm

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29. Find the areas of the circles whose diameters are given below:(iii)200 cm

30. Find the areas of the circles whose diameters are given below:(iv)2.4 cm

31. Find the radii of the circles whose areas are given below:(i) $\dfrac{88}{7} m^2$

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32. Find the radii of the circles whose areas are given below:(ii) $154 cm^2$

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33. Find the radii of the circles whose areas are given below:(iii)$462 m^2$

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34. Find the radii of the circles whose areas are given below:(iv)$154 cm^2$

▶ **Watch Video Solution**

35. Find the radii of the circles whose areas are given below:(v)$1386cm^2$

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36. Find the radii of the circles whose areas are given below:(vi)$\dfrac{2200}{7}cm^2$

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37. Find the radii of the circles whose areas are given below:(vii) $\dfrac{13750}{7} cm^2$

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38. Find the radii of the circles whose areas are given below:(viii) $5544 cm^2$

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39. If the circumference of a circle is 880cm.find its area.

40. The circumference of a circle is equal to the perimeter of a square of side 11 cm.Find the area of the circle.

41. Find the area of the greatest possible circle that can be cut out from a tin sheet of size $30cm \times 40cm.$

42. Which has a greater area,a suqare of perimeter 88 cm.or a circle with circumference 88 cm?

43. The ratio of the areas of two circles is 25:36.Find the ratio of their circumferences.

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44. If the radius of a circle is doubled,by how many times will its area be increased?.

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45. The wheels of a car move 5 times in a second.If the diameter of a wheel is 84 cm.Find the speed of the car in km/hr.

46. The area of the region between two concetric circles is $346.5 cm^2$.If the circumference of the inner circle is 88 cm.,find the radius of the outer circle.

47. Find the area of the shaded region shown in Fig.11,if the radius of each of the sectors is 7 cm. $\left(\pi = \dfrac{22}{7} \right)$
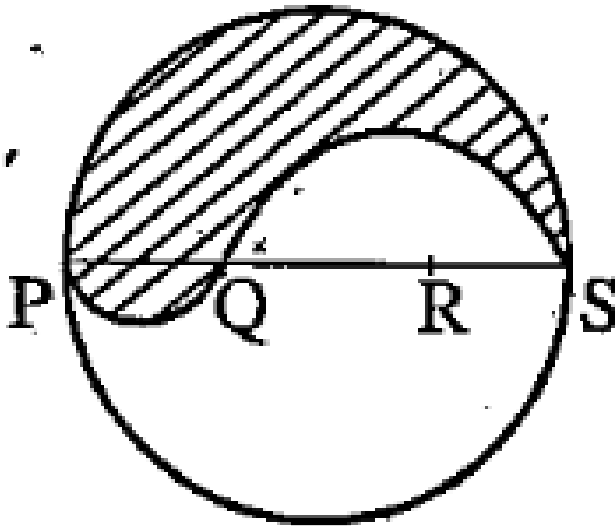
A ←7→ ←7→ B
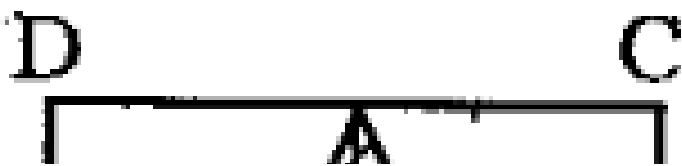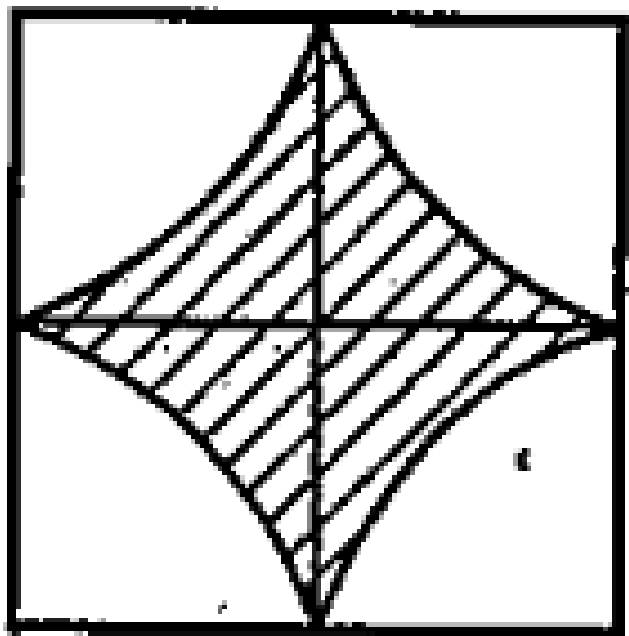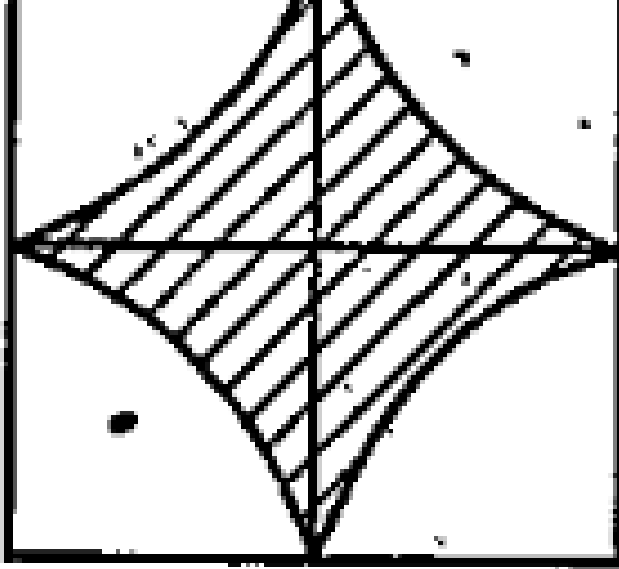
48. In Fig 12,PS is a diameter of a circle whose

radius is 6 cm.Two points Q and R are taken on

PS such that PQ=QR=RS.Two semicircles are

drawn with PQ and QS as their respective diameters as shown in the figure.Find the perimeter and the area of the shaded region shown in figure.(pi=3.14)`

49. The diameter of a wheel is 28 cm.How many times will the wheel move to cover a distance of 352. m? $\left(\pi = \dfrac{22}{7} \right)$

50. There is a path 14 m wide all round a circular garden of diameter 120m.Find the area of the path.

51. The area of a circle is $154cm^2$.Find the length of one side of the greatest possible square that can be drawn within the circle.

52. In Fig 13,ABCD is a square of side 5.6 cm.As shown in the figure,four circles are drawn with centres A,B,C and D respectively.Find the area

of the shaded region in the diagram. (pi=22/7)
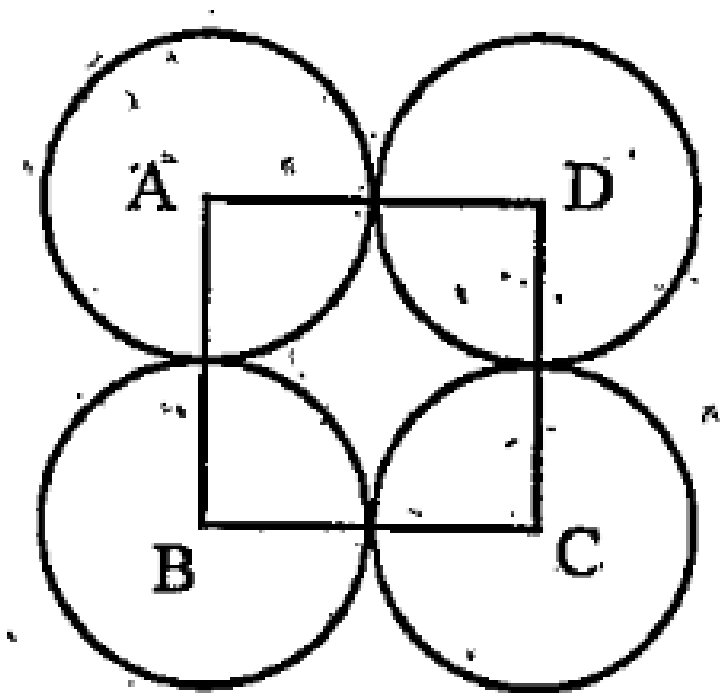
53. The outer radius and the inner radius of a

circular ring are respectively 25 cm and 24

cm.Find the area of the region which falls under the ring.

54. The outer radius of a circular ring is 21 cm.and its area is $26 cm^2$.Find its inner radius.

55. The area of the region between two concetric circles is $770 cm^2$ If the radius of the

greater circle is 21 cm.Find the radius of the smaller circle.

56. The area of a circular garden is $1386m^2$ .Find the perimeter of the garden.

57. A 7 m wide path runs round a circular garden whose circumference is 352m.Find the

area of the path.

58. Find the area of the greatest possible circle that can be cut out from a rectangular board of length 30cm and breadth 21 cm.

59. The perimeter of a circular field is 660cm.A square-shaped portion of the field is

demarcated in such a way that its four vertices lie on the outside boundary of the field.Find the area of the square-shaped region of the field.

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60. Find the area of one-fourth of a circle with circumference 22 cm.

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61. An area of length $4\pi cm$.subtends an angle $40°$ at the center of a circle.Find the area of the sector produced by the arc.

62. The angle at the center of a sector of a circle is $60°$ and the radius of the circle is 21 cm.Find the perimeter and the area of the sector of the circle.

63. The angle at the center of a sector of a circle of radius 42 cm is $120°$.Find the length of the arc producing the sector and also the area of the sector of the circle.

64. A sector from teo concentric circle is shown in Fig.14.If the radii of the circles are respectively 3.5 cm and 7 cm,find the area of

the shaded region in the figure.
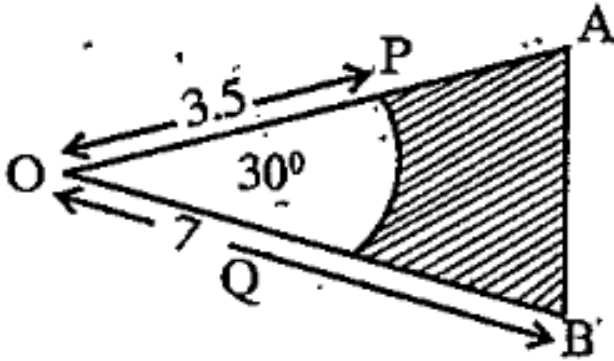
65. The radius of a circle is 14 cm.If the area of a sector of the circle is $102.7 cm^2$,then find the angle made by the sector at its centre.

66. The perimeter of a sector of a circle of radius 5.6 cm is 27.2 cm.Find the area of the sector.

67. While oscillating a distance of 88 cm,a pendulum subtends an angle of $60°$ at the centre.Find the length of the pendulum.

68. The radius of a circle is 17.5 cm.Find the area of a sector made by an arc of length 44 cm.

69. The length of a radius of a circle is 10 cm.A chord substends an angle $90°$ at the centre.Find the area of each of the two segments made by the chord.$[\sin 90° = 1]$

70. The radius of a circle with centre O is 15 cm.The chord AB subtends an angle of $60°$ at the centre O of the circle.Find the areas of the two segments made by AB.[$\pi = 3.14, \sin 60° = \dfrac{1.73}{2}$]

71. The length of a side of a square is 4 cm.A circle is drawn through the four vertices of the

square.Find the area of the portions between the circle and the square.

Exercise

1. The radii of two circle are 19 cm and 9 cm respectively.Find the radius of the circle which has circumference equal to the sum of the circumference of the two circles.

2. The radii of two circle are 19 cm and 9 cm respectively.Find the radius of the circle having area equal to the sum of the area of the two circles.

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3. Fig.12.3 depicts an archerytarget marked with its five scoring regions from the centre outwards as Gold,Red,Blue,Black and White.The diameter of the regions

representing Glod score is 21 cm and each of the bands is 10.5 cm wide.Find area of each of the five scoring regions.
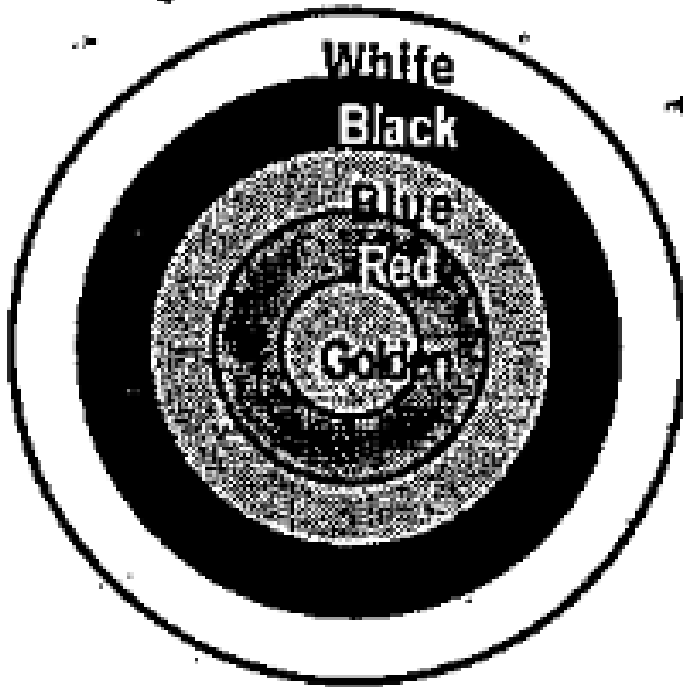
4. The wheels of a car of diameter 80cm each.How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour?

5. Tick the correct answer in the following and justify your choice:If the perimeter and the area of the 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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6. Find the area of a sector of a circle with

radius 6 cm if angles of the sector is $60°$.

▶

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

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

9. 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.(use $\pi = 3.14$)

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

11. In a circle of radius 21 cm,an arc subtends an angle of $60°$ at the centre.Find (i) the length of the arc

12. In a circle of radius 21 cm,an arc subtends an angle of $60°$ at the centre.Find (ii)area of the sector formed by the arc

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

14. A chord of 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 $\sqrt{3} = 1.73$)

15. A chord of a circle of radius 12cm subtends an angle of $120°$ at the center. Find the area of the corresponding segment of the circle.(use $\pi = 3.14$ and $\sqrt{3} = 1.73$)

16. A brooch is made with silver wire in the form of a circle with diameter 35 mm.The wire is also used in making 5 diameter which divide the circle into 10 equal sectors as shown in Fig.12.12 .Find:(i)the total length of the silver
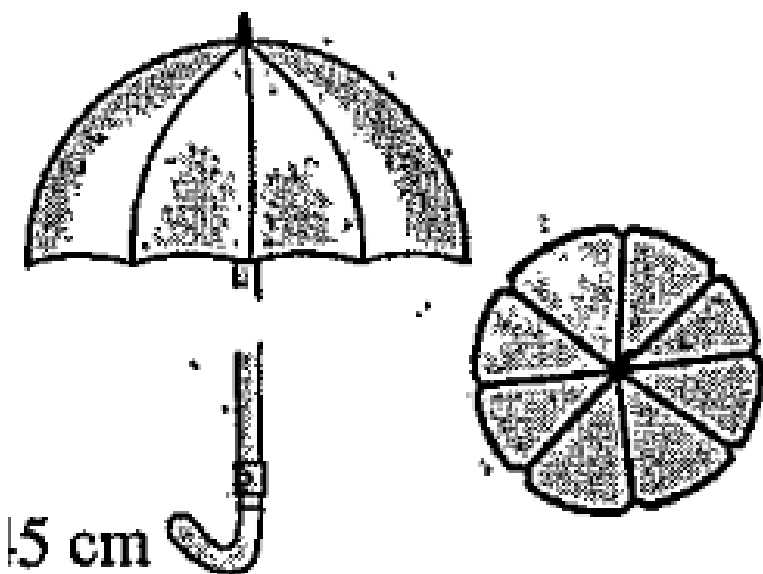
wire required.
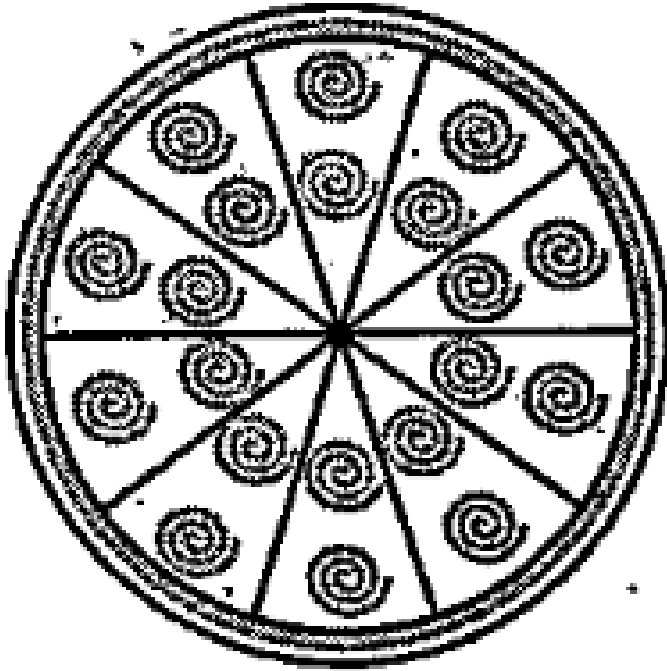
17. A brooch is made with silver wire in the

form of a circle with diameter 35 mm.The wire

is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in Fig.12.12
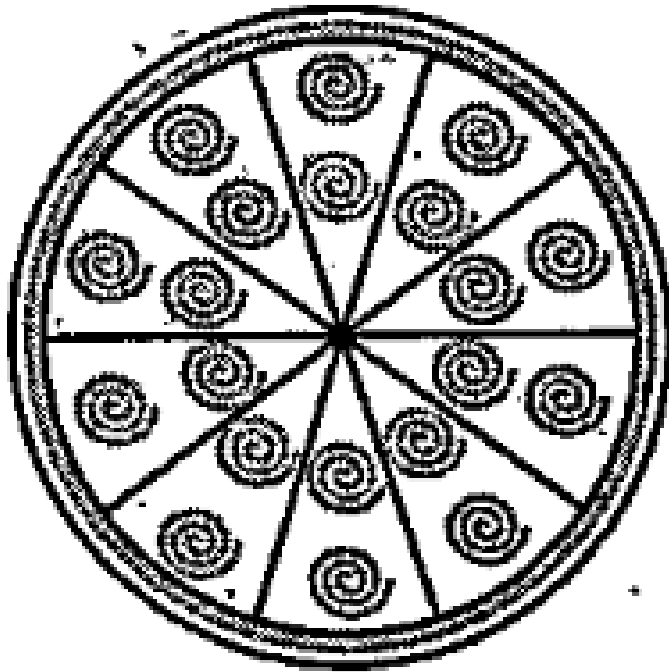
Find:(ii)the area of each sector of the brooch.

18. An umbrella has 8 ribs which are equally spaced (see Fig.12.13).

5 cm

Assuming unbrella to be a flat circle of radius 45 cm.Find the area between the two consecutive ribs of the umbrella.

19. A car has two wipes which do not overlap.Each wiper has a blade of length 25 cm seeping through an angle of $115°$.Find the total area cleaned at each sweep of the blades.

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20. To warn ships for underwater rocks,a lighthouse spreads a red coloures light over a sector of angle$80°$to a distance of 16.5

km.Find the area of the sea over which the ship are warned.(Use $\pi = 3.14$)

21. A round table cover has six equal designs as shown in Fig.12.14.
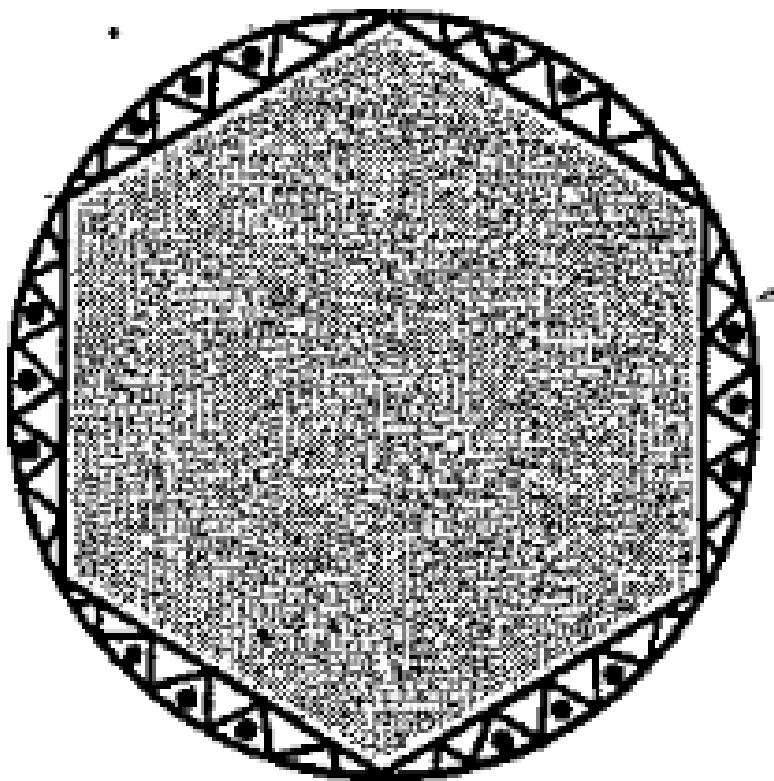
If the radius of the cover is 28 cm,find the cost of making the designs at the rate of $Rs. 0.35 per cm^2$ (use `sqrt3=1.7)

22. Tick the correct answer in the following :Area of a sector of angle p(in degrees) of a circle with radius R is

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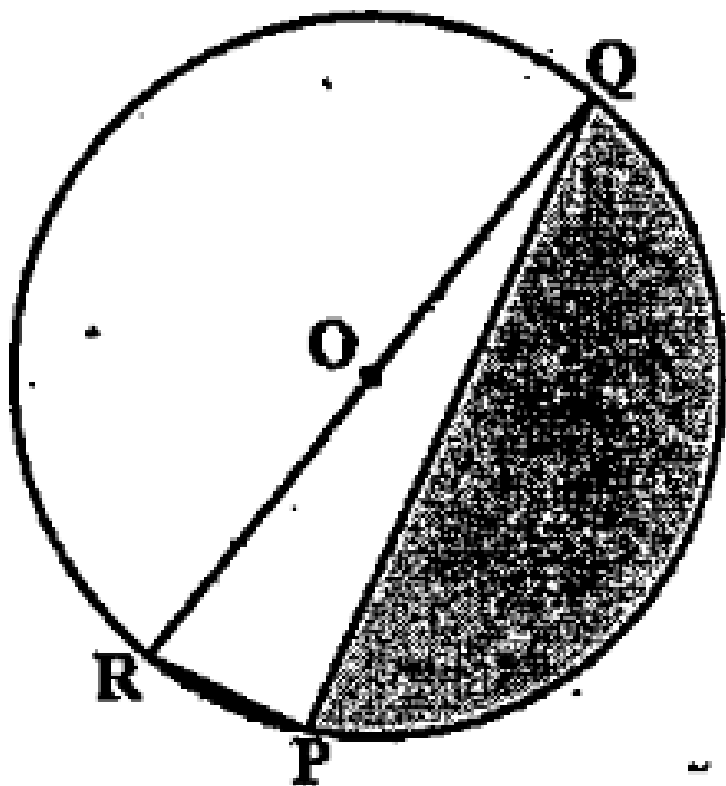
B. $\dfrac{p}{180} \times \pi R^2$

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

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

Answer:

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23. Find the area of the shaded region in Fig.12.19,If PQ=24cm,PR=7 cm and O is the centre of the circle.

24. Find the area of the shaded region in Fig12.20,if radius of the two concentric circle with centre O are 7 cm and 14 cm respectively and $\angle AOC = 40°$.
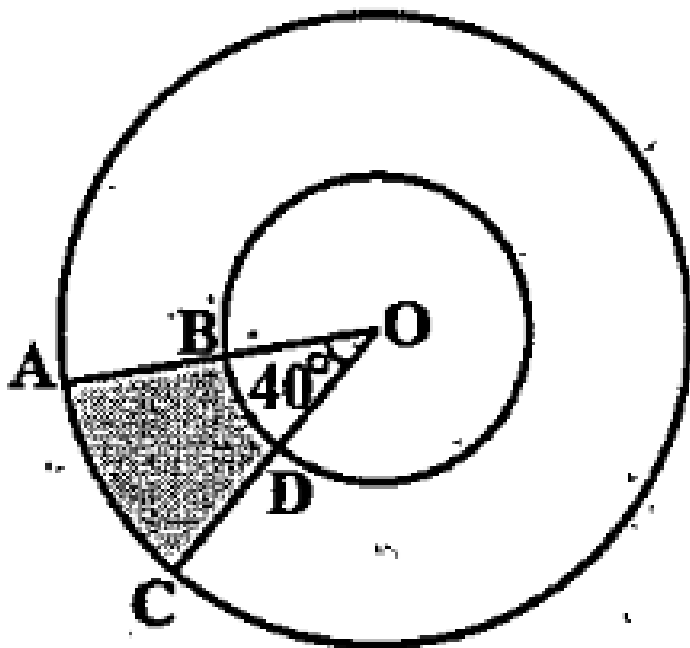
25. Find the area of the shaded region in Fig.12.21,If ABCD is a square of side 14 cm and APD and BPC are semicircles.
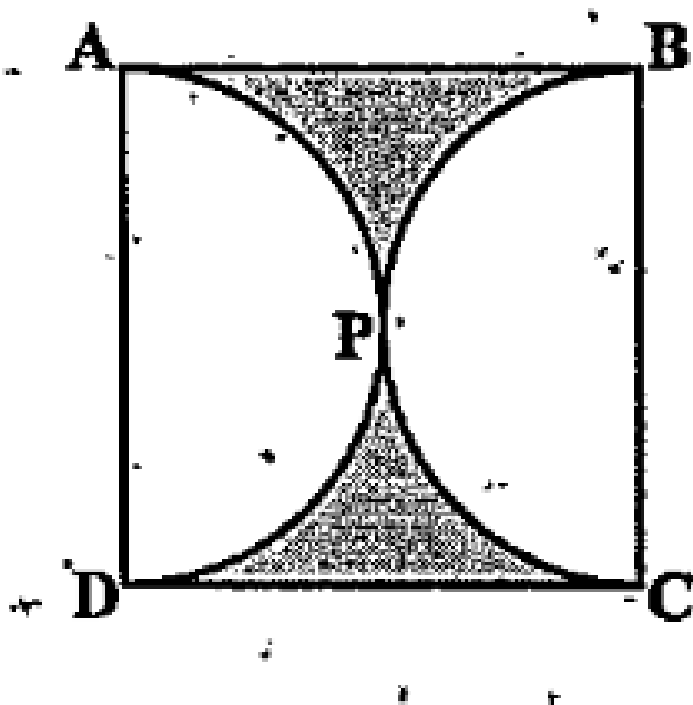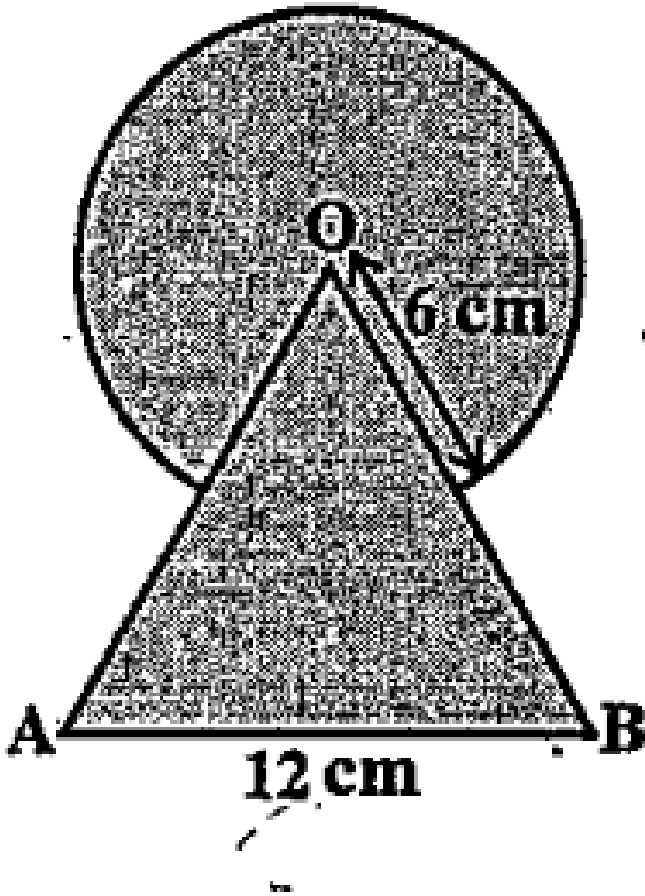
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26. Find the area of the shaded region in Fig.12.21,,where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral
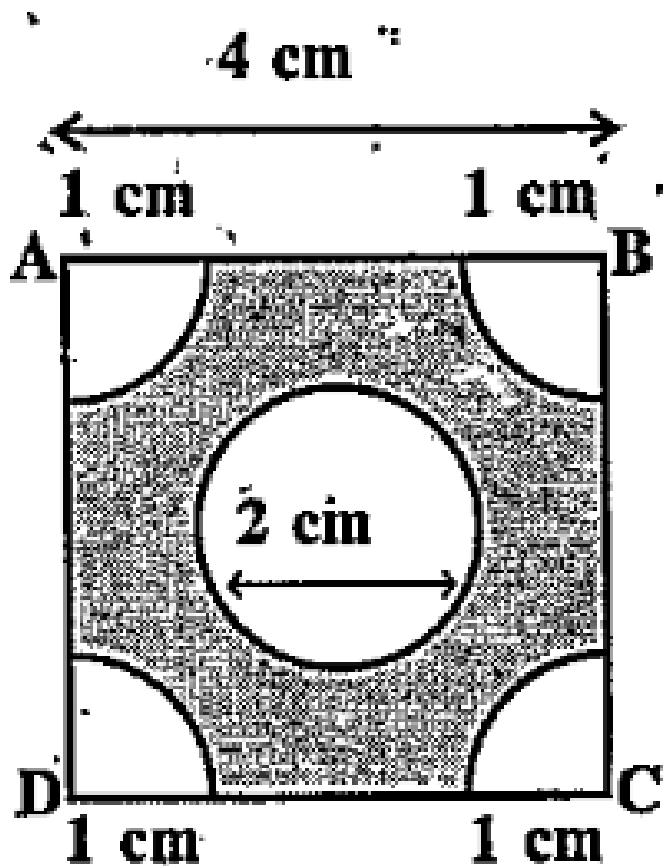
triangle OAB of side 12 cm as centre.

27. From each cornor 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

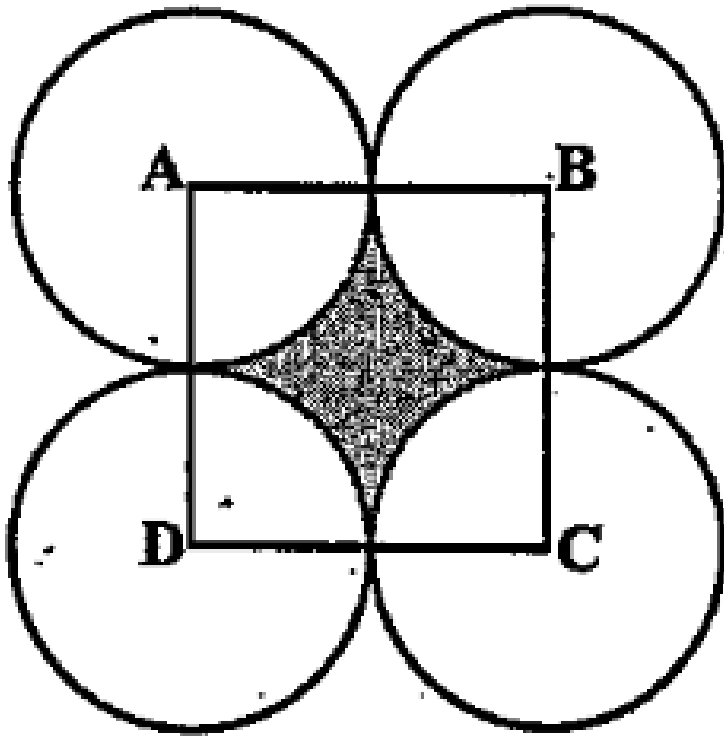in Fig.12.23.Find the area of the remaining

portion of the square.

28. In Fig.12.25,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.

29. In Fig12.26 depicts a racing track whose left and right ends are semicircular.The distance between the two inner parallel line segments is 60 and they are each 106 m long.If the track is 10 m wide,find:(i)the distance around the track along its inner edge
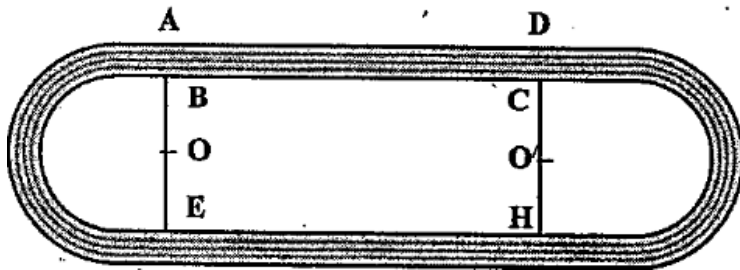
30. The area of an equilateral triangle ABC is $17320.5cm^2$.With each vertex of the triangle as center,a circle is drawn with radius equal to half the length of the side of the triangle(seeFig.12.28).Find the area of the shaded region.(use $\pi = 3.14$ and
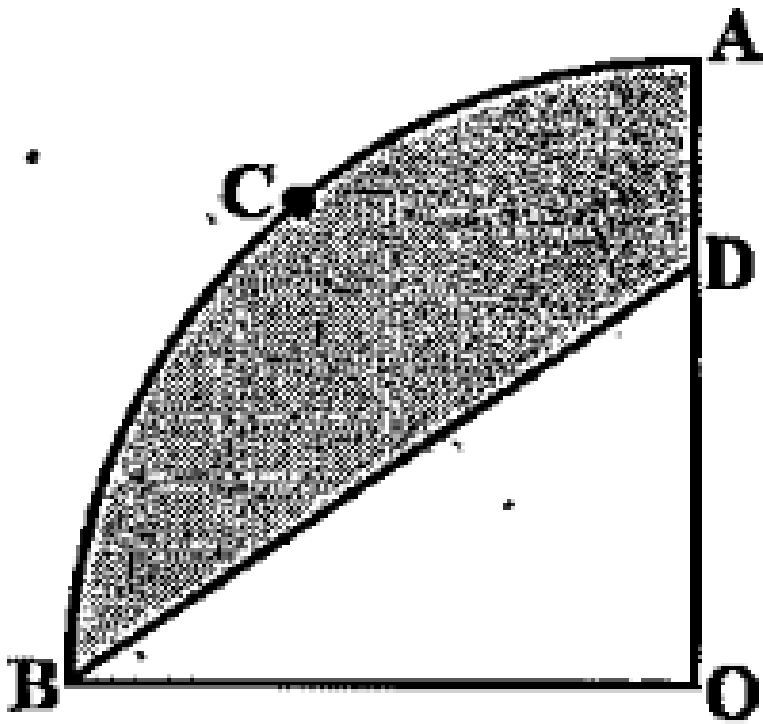
$\sqrt{3} = 1.73205)$
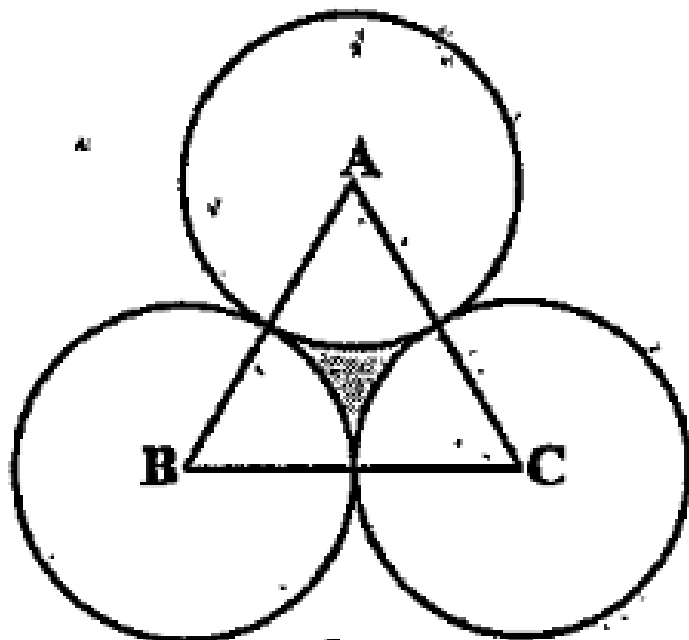
31. On a square handkerchief,nine circular designs each of radius 7 cm are made (see Fig.12.29).Find the area of the remaining portion of the handkerchief.
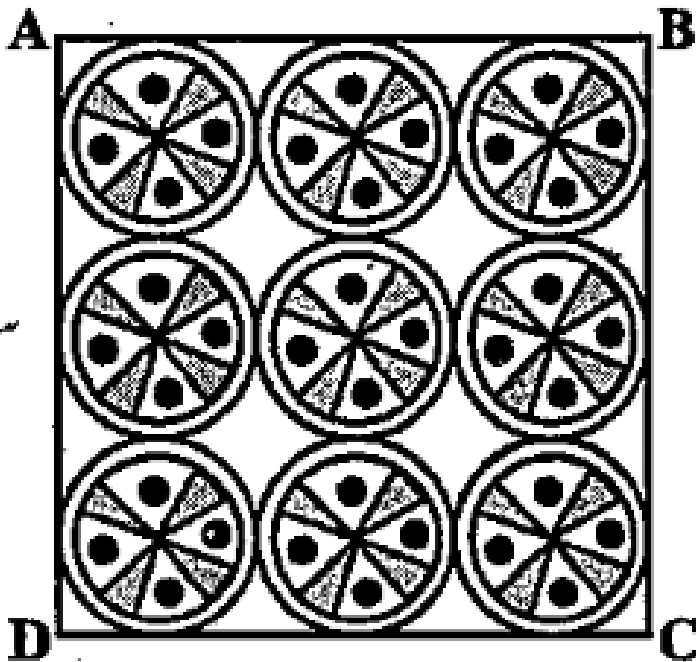
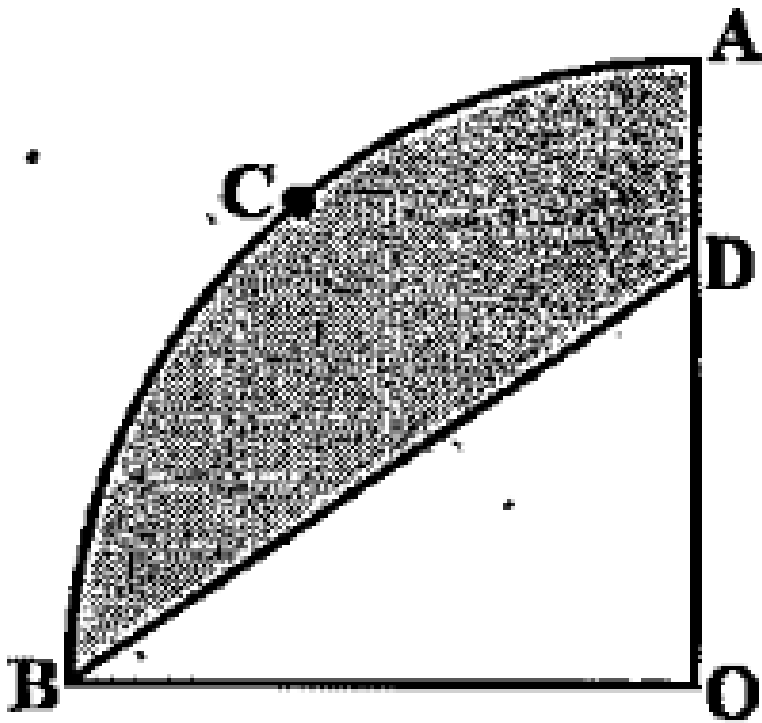**32.** If Fig.12.30,OACB is a quadrant of a circle with centre O and radius 3.5 cm.If OD=2 cm.find

the area of the (i) quadrant OACB,

33. If Fig.12.30,OACB is a quadrant of a circle with centre O and radius 3.5 cm.If OD=2 cm.find the area of the(ii)shaded region

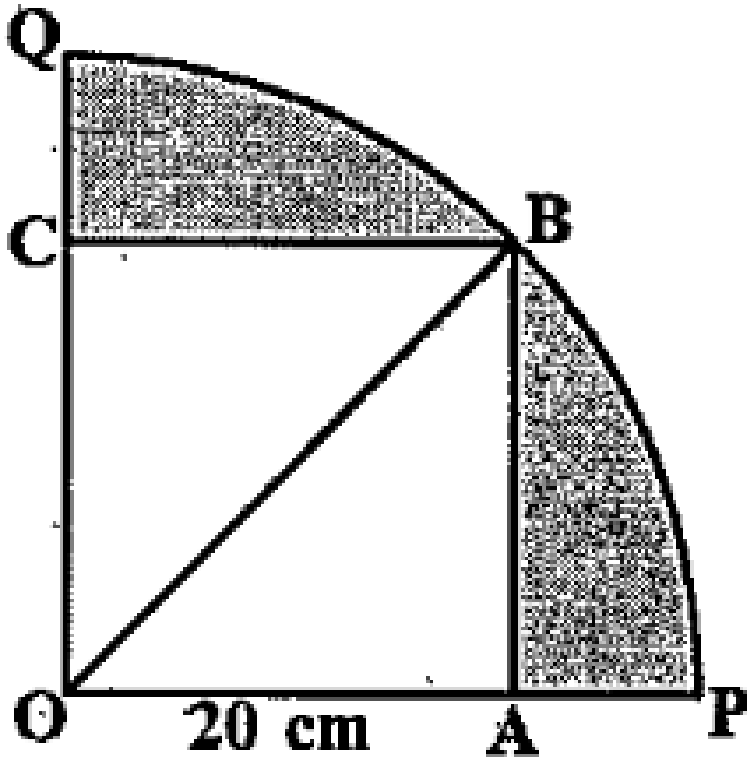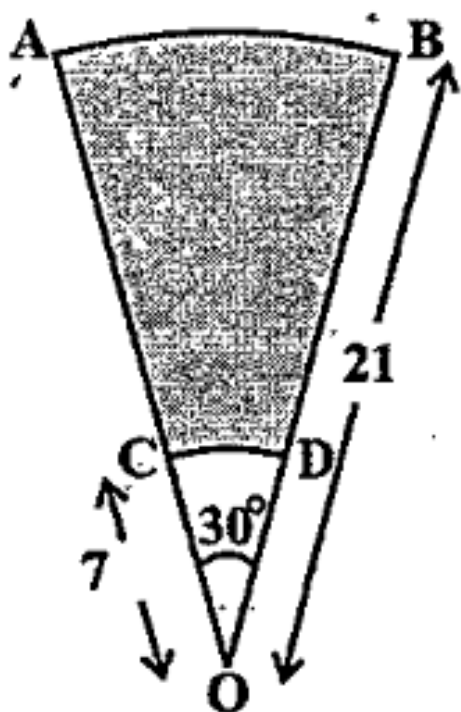**34.** In Fig.12.31,a square OABC is inscribed in a

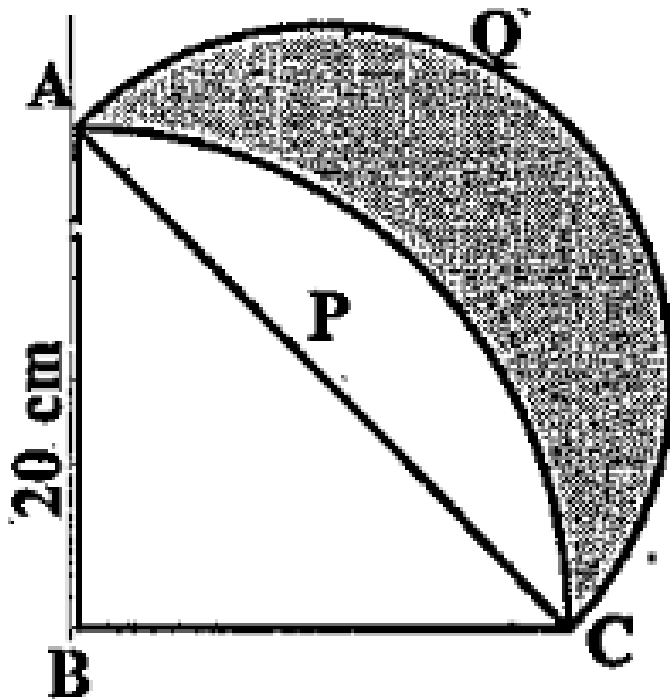quadrant OPBQ.If OA=20cm,find the area of the

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

35. AB and CD are respectively arcs of two concentric circles of radii 21 cm and 7 cm and centre(see Fig.12.32).If $\angle AOB = 30°$,find the area of the shaded region.

36. In Fig.12.33.ABC is a quadrant of a circle of radius 20 cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.

37. Calculate the area of the designed region in Fig.12.34 common between the two quadrants of circles of radius 8 cm each.
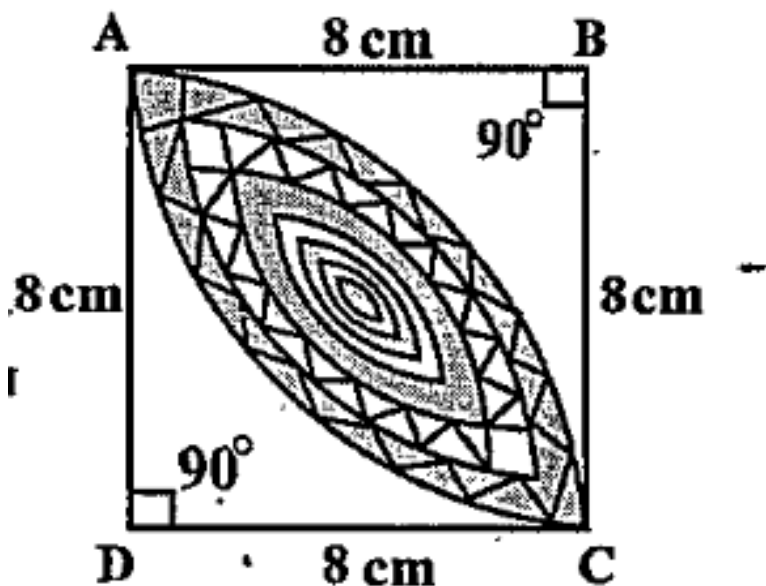
38. What is the area of the sector of a circle whose radius r and length of the arc is l.

39. If the diameter of a semi-circular protactor is 14 cm then find its perimeter.

40. What is the ratio of the areas of a circle and an equilateral triangle whose diameter and side are respectively equal?

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41. If the perimeter of a semi circle protactor is 66 cm then find its radius.

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42. If a chord of a circle of radius 14 cm subtends a right angle at the centre then what will be the area of the sector?

43. The circumference of a circle is 44cm then its area will be

   A. $308cm^2$

   B. $154cm^2$

C. $121 cm^2$

D. None of these

Answer:

44. If the circumference and the area of a circle are numerically equal the diameter of the circle is

A. π

B. 4π

C. 4

D. 16

Answer:

45. The perimeter of a circular field is 242 m then the area of the field is

A. $4658.5m^2$

B. $2348.5 m^2$

C. $35200 m^2$

D. $9317 m^2$

Answer:

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46. The difference between the circumference and radius of a circle is 37 cm.The area of the circle is

A. $184 cm^2$

B. $154 cm^2$

C. $121 cm^2$

D. $310 cm^2$

Answer:

47. The area of a circle is $49\pi cm^2$.Its circumference is

A. $14\pi cm$

B. $54\pi cm$

C. $3.5\pi cm$

D. $7\pi cm$

Answer:

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48. The area of two circles are in the ratio 4:9.The ratio of their circumference is

A. $3:2$

B. $2:3$

C. $8:18$

D. $16:81$

Answer:

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49. The radius of a wheel is 0.25m.The number of revolution it will make to travel a distance 11km will be__-

A. 7500

B. 7000

C. 3500

D. 4000

Answer:

50. The area of incircle of an equilateral triangle is $154cm^2$ then the perimeter of the triangle is

A. 72 cm

B. 72.7 cm

C. 72.5 cm

D. 72.17 cm

Answer:

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51. The area of a circle is $220cm^2$. The area of a square inscribed in it is

A. $140 cm^2$

B. $154 cm^2$

C. $121 cm^2$

D. $70 cm^2$

Answer:

52. The area of the circle that can be inscribed in a square of side 10 cm is

A. $50\pi cm^2$

B. $25\pi cm^2$

C. $75\pi cm^2$

D. $100\pi cm^2$

Answer:

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53. If diameter of a circle is increased by 40%

then its area increased by

A. 0.8

B. 0.96

C. 0.2

D. 0.5

Answer:

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54. On decreasing the radius of a circle by 30%

its area is decreased by

A. 0.15

B. 0.3

C. 0.45

D. None of these

Answer:

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55. If the radius of a circle is diminished by

10% then its area is diminished by

A. 0.19

B. 0.29

C. 0.05

D. 0.2

Answer:

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56. The area of the largest triangle that can be

inscribed in a semi-circle of radius r is

A. πr

B. r^2

C. πr^2

D. $\dfrac{\sqrt{3}}{2}r$

Answer:

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57. If the area of a square and a circle are same then the ratio of their perimeters in terms of

π is __

A. $\pi : \sqrt{2}$

B. $\sqrt{2} : \pi$

C. $1 : \pi$

D. $\pi : 1$

Answer:

58. If the circumference of a circle increases from $4\pi \to 8\pi$ then its area is

A. halved

B. doubled

C. tripled

D. quadrupled

Answer:

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59. If the perimeter of a circle is equal that of a

square then the ratio of their area is

A. 0.46805555555556
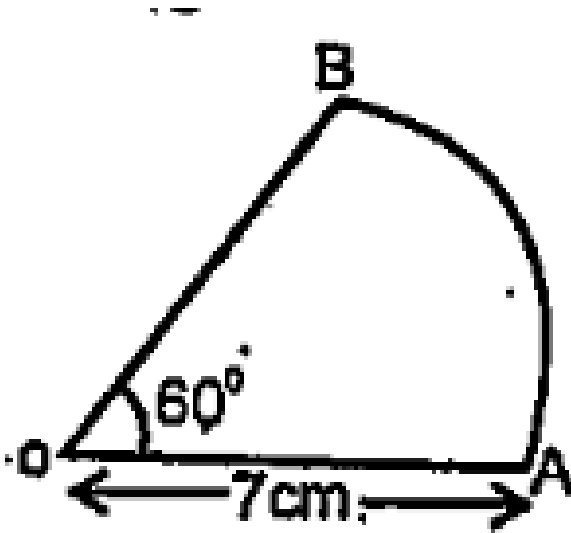
B. 0.59097222222222

C. 0.29930555555556

D. 0.46319444444444

Answer:

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60. The perimeter of the sector OAB in figure is

A. 64/5cm

B. 64/3cm

C. 61/3cm

D. 61/5cm

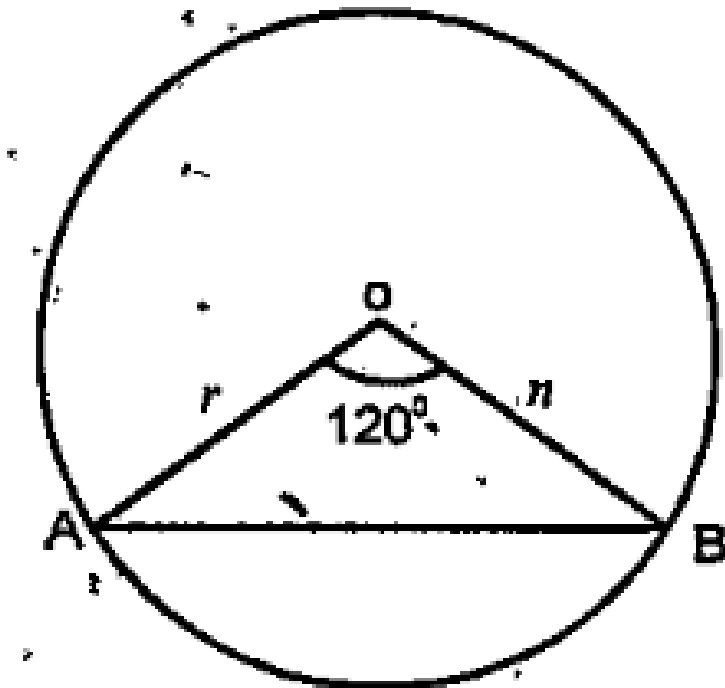**Answer:**

61. In figure the area of the segment ABC is

A. $\left(\dfrac{\pi}{3} + \dfrac{\sqrt{3}}{2} \right) r^2$

B. $\left(\dfrac{\pi}{3} - \dfrac{\sqrt{3}}{2} \right) r^2$

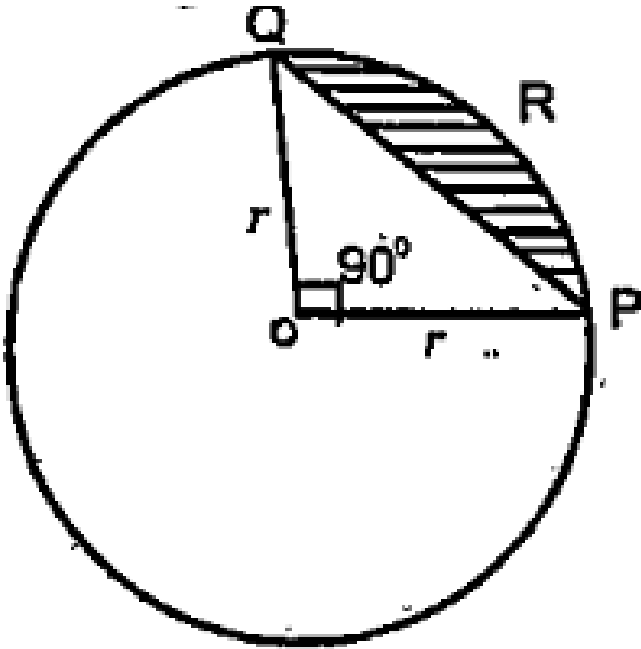C. $\left(\dfrac{\sqrt{3}\pi}{2} + \dfrac{1}{3} \right) r^2$

D. $\left(\dfrac{\sqrt{3}\pi}{2} - \dfrac{1}{3} \right) r^2$

Answer:

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62. In figure the area of the segment PRQ is

A. $\dfrac{r^2}{4}(\pi - 1)$
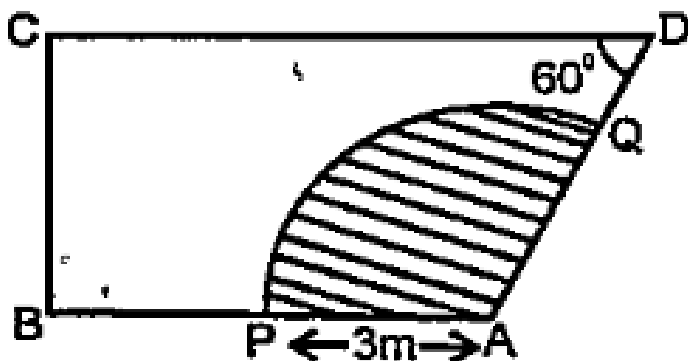
B. $\dfrac{r^2}{4}(\pi - 2)$

C. $\dfrac{r^2}{4}(\pi + 1)$

D. $\dfrac{r^2}{4}(\pi + 2)$

Answer:

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63. In figure the area of the shaded region is

A. $9\pi cm^2$

B. $3\pi cm^2$

C. $12\pi cm^2$

D. $1.5\pi cm^2$

Answer:

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64. If the area of a sector of a circle is 5/18 of the area of the circle then the sector angle is

A. $90°$

B. $100°$

C. $120°$

D. $180°$

Answer:

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65. If the area of a circle is equal to the sum of

the areas of two circles of diameters 10cm and

24 cm then diameter of the larger circle(in cm)

is

A. 18

B. 26

C. 17

D. 14

Answer:

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