MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

AREA OF CIRCLE, SECTOR AND SEGMENT

Solved Examples

1. Find the circumference and area of a circle of diameter of 28 cm.

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2. Find the area of a circle whose circumference is 66 cm.

A. $= 246.5cm^2$

B. $= 356.5cm^2$

C. $= 345.5cm^2$

D. $= 346.5cm^2$

Answer: D

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3. A steel wire when bent in the form of a square encloses an area of $121\ cm^2$. If the same wire is bent in the form of a circle, find the area of the circle.

A. 144 sq.cm

B. 164 sq.cm

C. 154 sq.cm

D. 174 sq.cm

Answer: C

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4. A wire is looped in the form of a circle of radius 28 cm. It is re-bent into a square form. Determine the length of the side of the square.

A. 44cm

B. 34 cm

C. 54 cm

D. 74 cm

Answer: A

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5. A circular park, 24m in diameter , has a path 3.5 m wide running round it on the outside. Find the cost of gravelling the path at Rs. 20 per m^2.

A. $Rs10010$

B. $Rs1001$

C. $Rs1000$

D. $Rs6050$

Answer: D

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6. A road which is 7 m wide surrounds a circular park whose circumference is 352 m. Find the area of road.

A. 2628 m^2

B. 2617 m^2

C. 2618 m^2

D. 2818 m^2

Answer: C

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7. A racetrack is in the form of a ring whose inner and outer circumferences are 437 m and 503 m respectively. Find the width of the track and also its area.

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8. If the perimeter of a semicircular protractor is 36cm, find its diameter.

A. 12 cm

B. 13 cm

C. 14 cm

D. 15 cm

Answer: C

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9. A bicycle wheel makes 5000 revolutions in moving 11 km. Find the diameter of the wheel.

A. 60 cm

B. 80 cm

C. $70cm$

D. 90 cm

Answer: C

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10. The diameter of the driving wheel of a bus is 140 cm. How many revolutions per minute must the wheel make in order to keep a speed of 66 km per hour?

A. 150

B. 250

C. 350

D. 450

Answer: B

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11. Two circles touch externally. The sum of their areas is $130\pi\ cm^2$ and the distance between their centres is 14cm. Find the radii of the circles.

A. 7 cm and 7 cm

B. 10 cm and 4 cm

C. 11 cm and 3 cm

D. 12 cm and 3 cm

Answer: C

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12. Two circles touch internally. The sum of their areas is $116\pi cm^2$ and distance between their centres is 16 cm. Find the radii of the circles

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13. Find the area of a right-angled triangle, if the radius of its circumcircle is 7.5 cm and the altitude drawn to the hypotenuse is 6 cm long.

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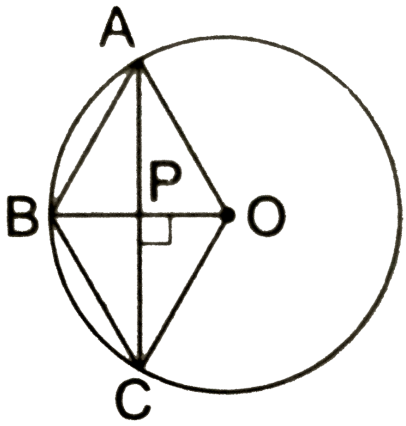
14. In the given figure $OABC$ is a rhombus whose three vertices A,B, C lie on a circle of radius 10 cm and centre O. Find the area of the rhombus. [Take $\sqrt{3} = 1.732$]



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15. In a circle a radius 21 cm. An arc subtends an angle 60° at the centre (i) the length of an arc. (ii) are of the sector formed by the arc (iii) the area of the segment made by this arc.

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16. A chord of a circle of radius 14 cm makes a right angle at the centre. Find the areas of the major segments of the circle.

A. $550\ cm^2$

B. $560\ cm^2$

C. 660 cm^2

D. 760 cm^2

Answer: B

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17. The perimeter of a sector of a circle of radius 14 cm is 68 cm. Find the area of the sector.

A. 270 cm^2

B. 280 cm^2

C. 260 cm^2

D. 240 cm^2

Answer: B

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18. The minute hand of a clock is 12 cm long. Find the area swept by it in 35 minutes.

A. 254 cm^2

B. 264 cm^2

C. 265 cm^2

D. 274 cm^2

Answer: B

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19. A car has wheels which are 80 cm in diameter. 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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20. A car has two wipers which do not overlap. Each wiper has a blade of length 21 cm, sweeping

through an angle of 120°. Find the total area cleaned at each sweep of the blades.

A. $= 824cm^2$

B. $= 924cm^2$

C. $= 928cm^2$

D. $= 934cm^2$

Answer: B

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21. Two warn ships for underwater rocks, a lighthouse spreads a redcoloured light over a sector of angle 72° to a distance of 15 km. Find the area of the sea over which the ships are warned. [Use $\pi = 3.14$]

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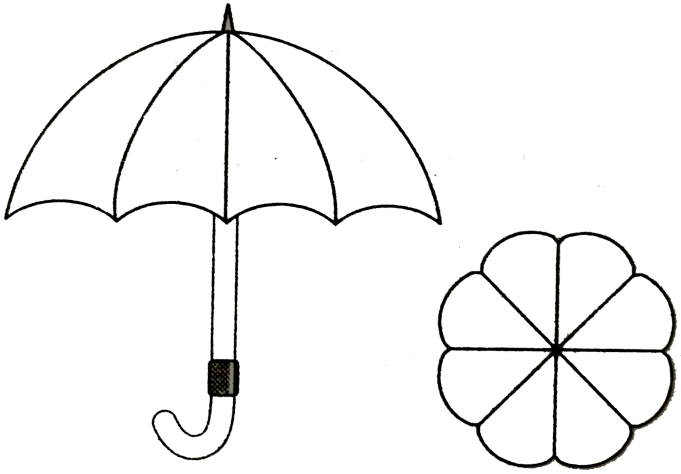
22. An umbrella has 8 ribs which are equally spaced (as shown in the figure).Assuming the umbrella to be a flat circle of radius 42 cm, find the area

between the two consecutive ribs of the umbrella.



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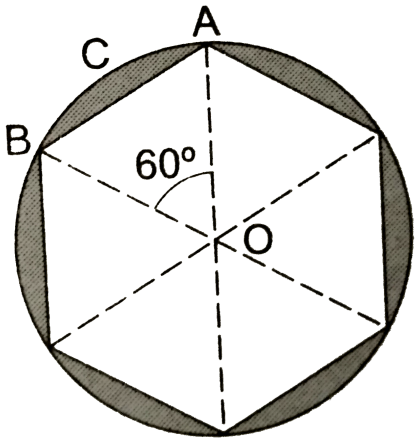
23. A round table cover has six and equal designs, as shown in the figure. If the radius of the cover is 28 cm find the cost of making the designs, at the

rate of Rs. 0.35 per cm^2. [Use $\sqrt{3} = 1.7$]



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24. A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find (i) the area of that part of the field in which the horse can graze. (ii) the increase in the grazing area if the rope were 10 m

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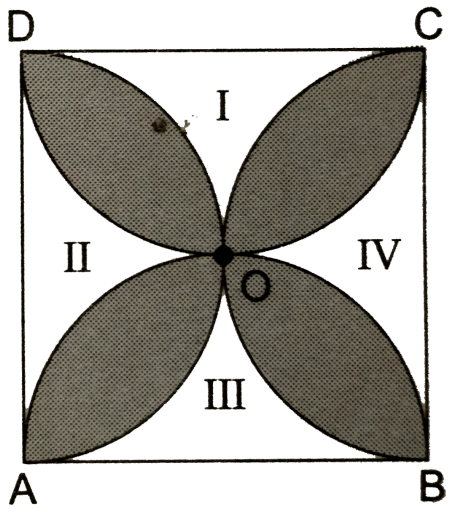
25. In the given figure, ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter. Find the area of the shaded region.

[Use $\pi = 3.14$]



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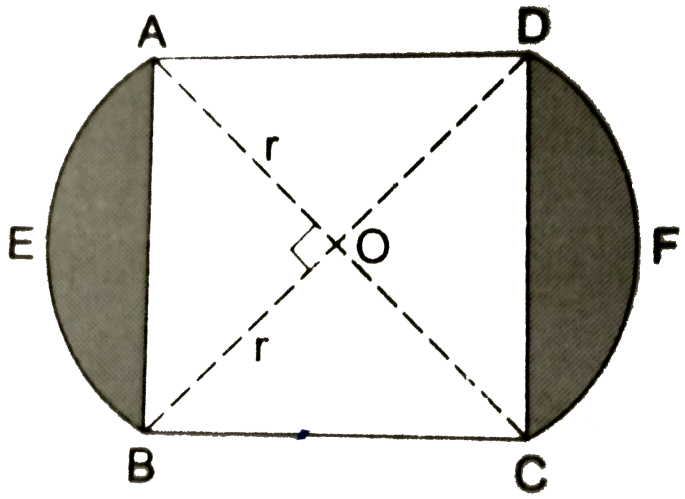
26. In the given figure, two circular flower beds have been shown on two sides of a square lawn ABCD of side $AB = 42m$. If the centre of each circular flower bed is the point of intersection O of the diagonals of the square lawn, find

(i) the sum of the areas of the lawn and flower beds,

(ii) the sum of the areas of two flower beds.



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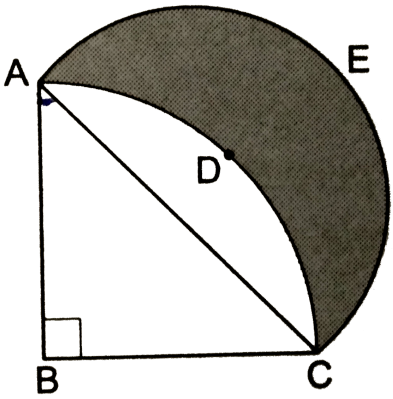
27. In the given figue, ABCD is a quadrant of a circle of radius 28 cm and a semicircle ABECA is drawn with AC as diameter. Find the area of the shaded

region.



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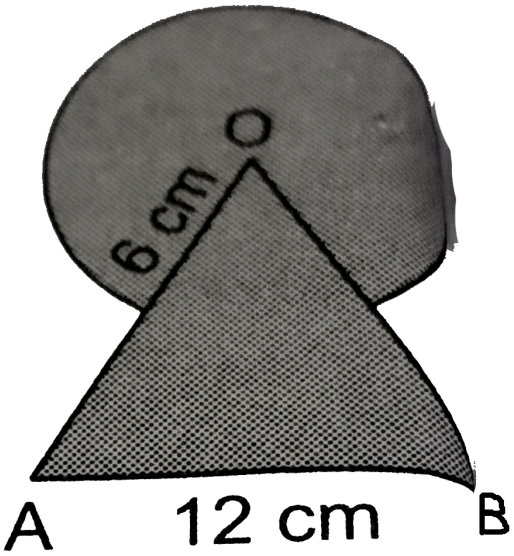
28. Find the area of the shaded region in the given figure, where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre.

[Take $\sqrt{3} = 1.73$ and $\pi = 3.14$]



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29. In the given figure, AB and CD are two diameters of circles (with centre O) Perpendicular to each

other and OD is the diameter of the smallest circle.

If OA = 7cm, Find the area of the shaded region.

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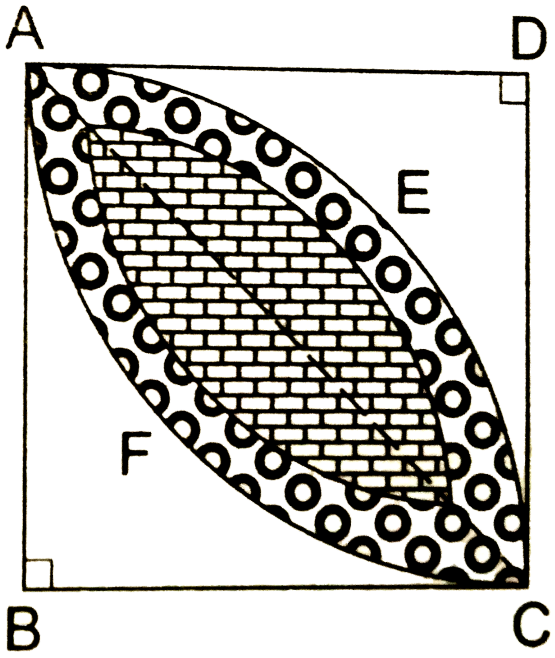
30. Calculate the area of the designed region in the given figure, common between two quadrants of

circles of radius 7cm each.



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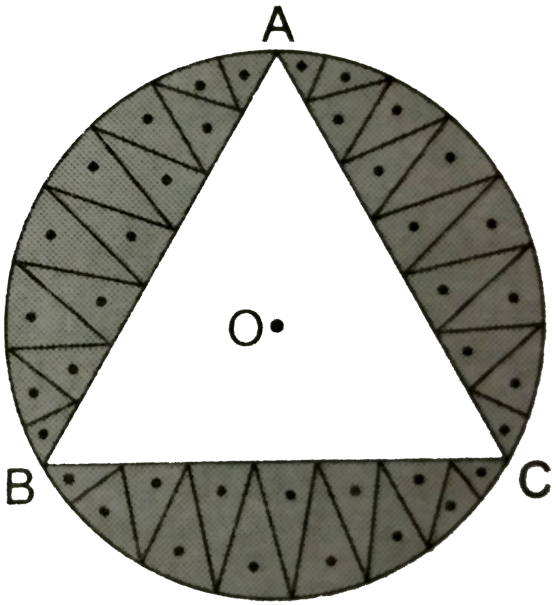
31. In a circulat table cover of radius 42 cm, a design is formed, leaving an equilateral triangle ABC in the

middle as shown in the figure.

Find the area of the design. [Use $\sqrt{3} = 1.73$]



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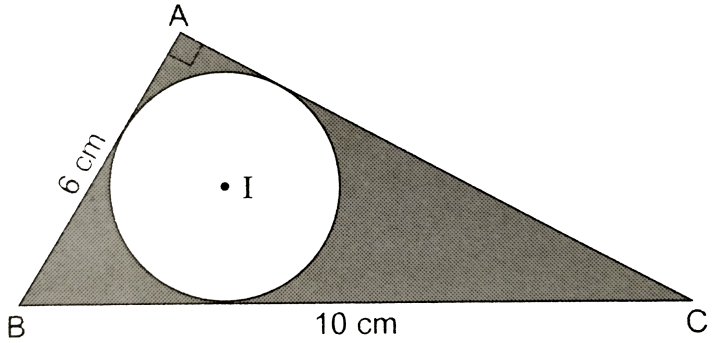
32. In the given figure, ABC is a right angled triangle, right -angled at A in which

$AB = 6cm$, $BC = 10cm$ and I is the incentre of ΔABC.

Find the area of the shaded region. [Take $\pi = 3.14$]



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33. In an equilateral triangle of side 12 cm, a circle is inscribed touching its sides. Find the area of the portion of the triangle not included in the circle. [Take $\sqrt{3} = 1.73$ abd $\pi = 3044$]

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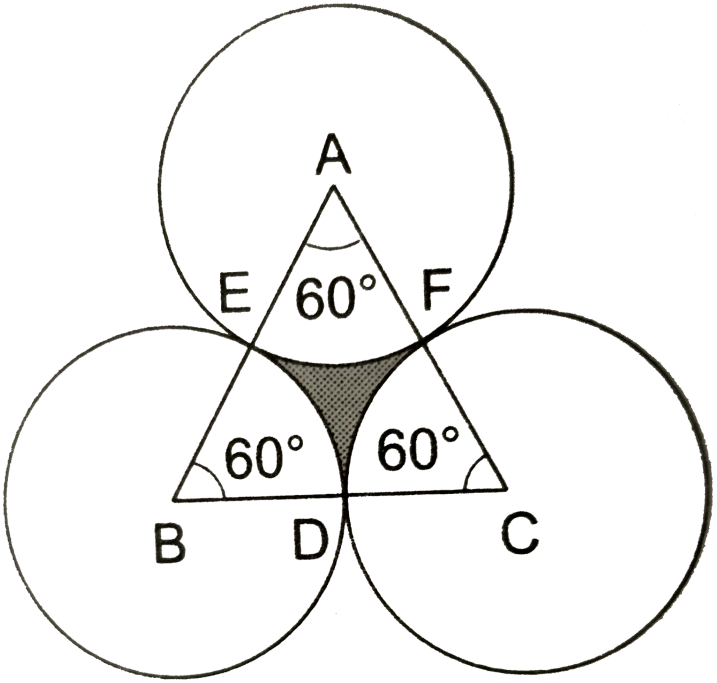
34. The area of an equilateral triangle is $100\sqrt{3}cm^2$. Taking each vertex as centre, a circle is described with radius equal to half the length of the side of the triangle, as shown in the figure. Find the area of that part o the triangle which is not included in the circles.

[Take $\pi = 3.14$ and $\sqrt{3} = 1.732$]



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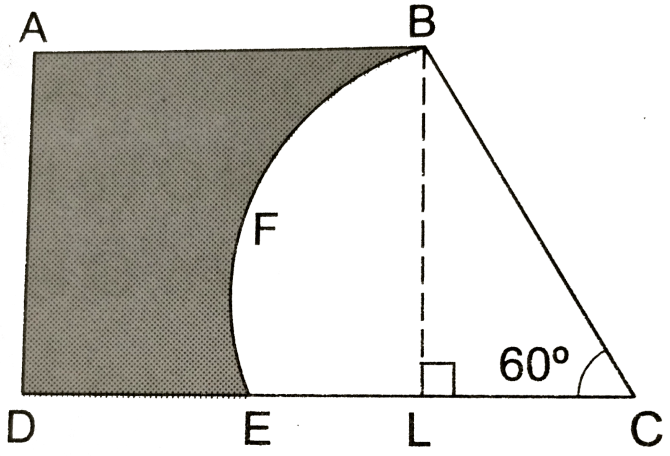
35. In the given figure, ABCD is a trapezium with $AB \| CD$ nad $\angle BCD = 60^\circ$.If BFEC is a sector

of a circle with centre C and $AB = BC = 7$ cm and $DE = 4cm$, then find the area of the shaded region. [Use $\pi = 22/7$ and $\sqrt{3} = 1.73$]



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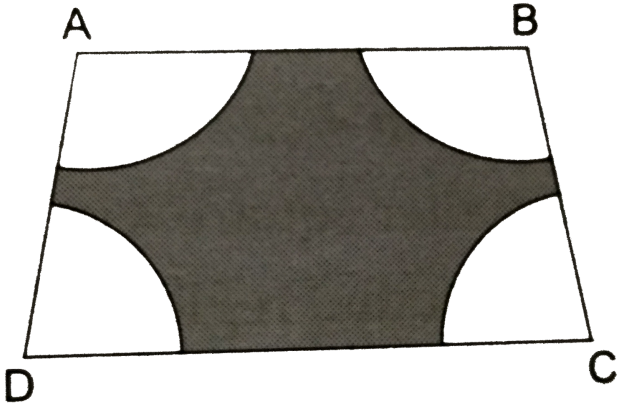
36. In the given figure ABCD is a trapezium in which $AB \| DC, AB = 18cm, DC = 32cm$ and the

distance between AB and DC is 14 cm. If arcs of equal radii 7 cm hav been drawn with centres A,B,C and D then find the area of the shaded region.



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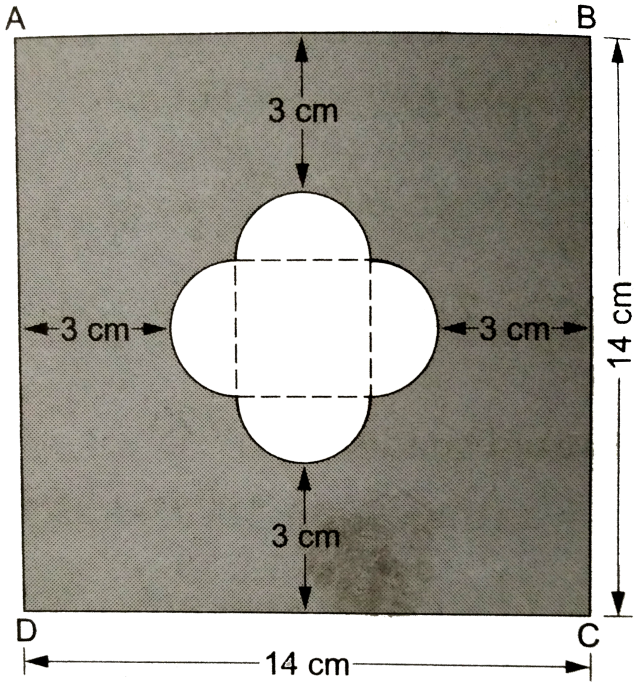
37. Find the area of the shaded region in the figure given below [Take $\pi = 3.14$]



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38. Three horses are tethered with 7 metre long ropes at the corners of a triangular field having sides 20m, 34m and 42m. Find the area of the plot

which can be grazed by the horses. Also, find the area of the plot which remains ungrazed.

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39. The inside perimeter of a running track is 340m. The length of each straight portion is 60m and the curved portions are semicircles. If the trackis 7m wide, find the area of the track. Also, find the outer perimeter of the track.

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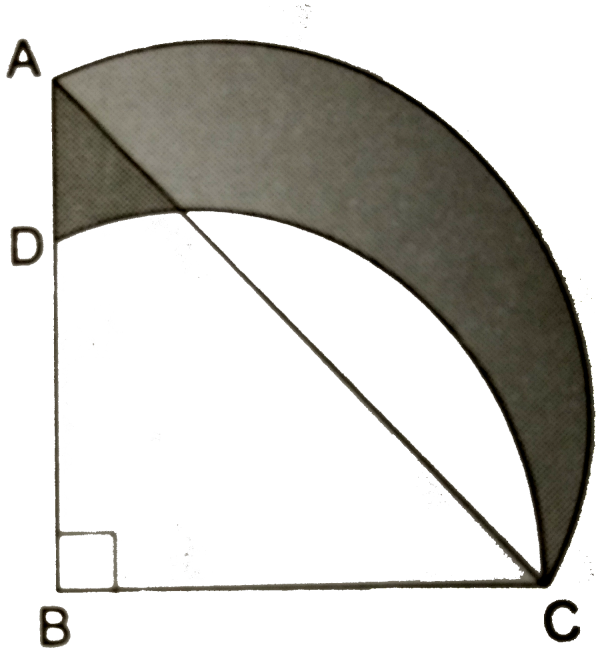
40. In the given figure ΔABC is a right angled triangle with $\angle B = 90^\circ$, $AB = 48cm$ and $BC = 14cm$. With AC as diameter a semicircle is drawn and with BC as radius, a quadrant of a circle is drawn. Find the area of the shaded region.

[Use $\pi = \frac{22}{7}$]



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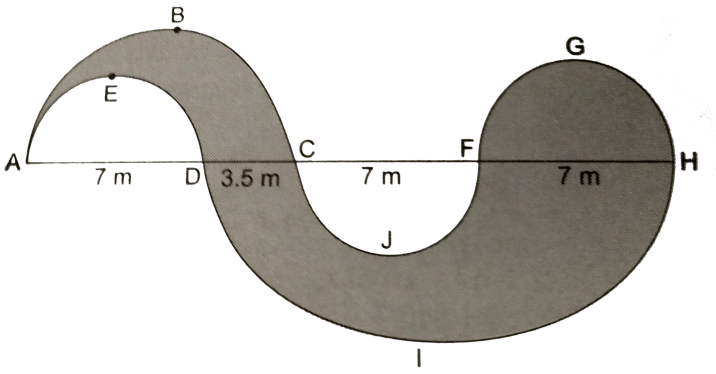
41. Find the area of the shaded region of the figure given below.



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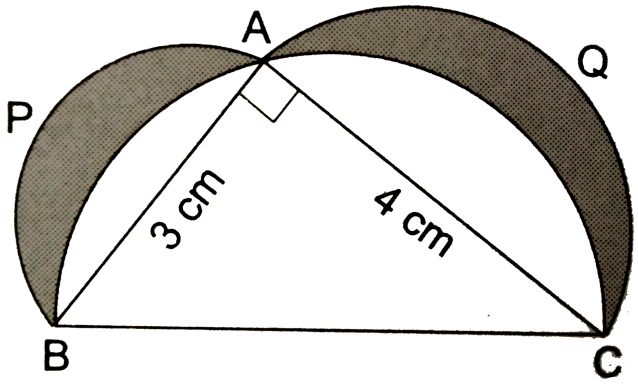
42. In the given figure, ΔABC is right angled at A. Semicircles are drawn on AB, AC and BC as

diameters. It is given that $AB = 3cm$ and $AC = 4cm$. Find the area of the shaded region.



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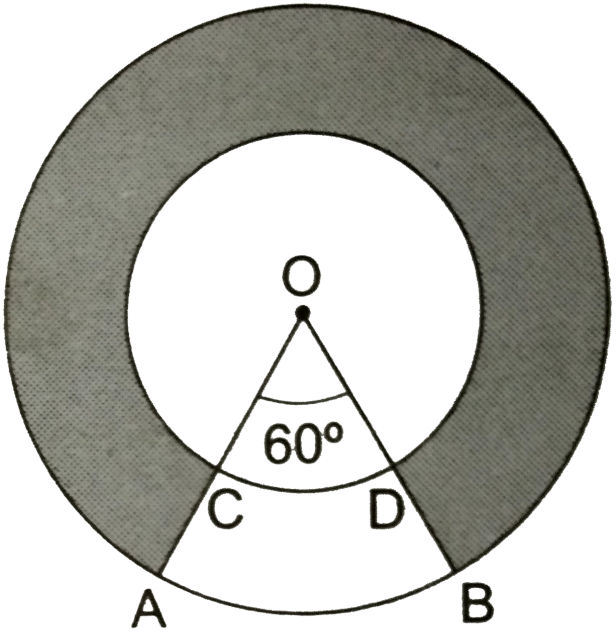
43. In the given figure, two concentric circles with centre O have radii 21 cm and 42 cm. If

$\angle AOB = 60^\circ$ find the area of the shaded region.



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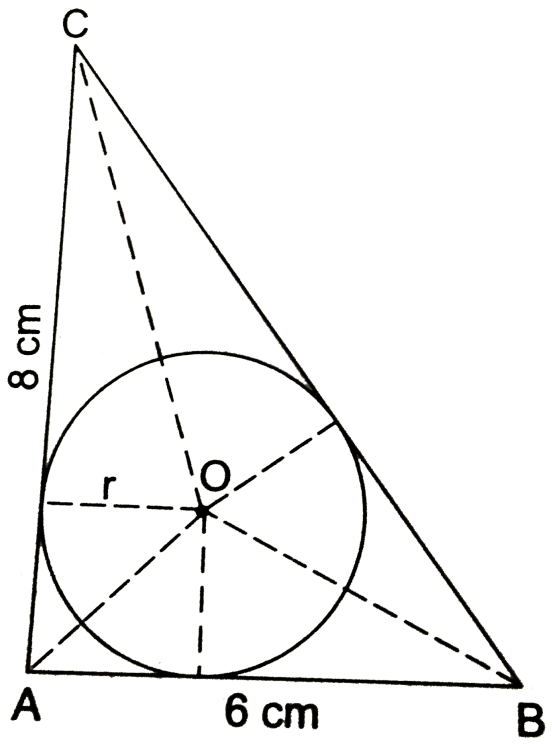
44. In the given figure ΔABC is right angle at A with $AB = 6$ cm and $AC = 8$ cm. A circle with centre O has been inscribed inside the triangle.

Find the value of r, the radius of the inscribed circle.



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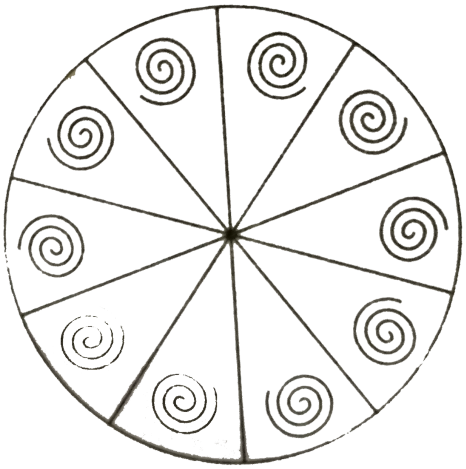
Solved Example Type

1. A broach is made with silver wire the form of a circle with diameter 35 mm. The wire is also used in making 5 diameter which divide the circle into then equal sectors, as shown in the figure



Find (i) the total length of the silver wire required

(ii) the area of each sector of the broach.

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Exercise 16 A

1. The circumference of a circle is 39.6 cm. Find its area.

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2. The area of a circle is $98.56cm^2$. Find its circumference.

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3. The circumference of a circle exceeds its diameter by 45 cm. Find the circumference of the circle.

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4. The copper wire, when bent in the form of a square, encloses an area of 484 cm^2 . If the same wire is bent in the form of a circle, find the area enclosed by it.

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5. A wire when bent in the form of an equilateral triangle encloses an area of $121\sqrt{3}cm^2$. If the same wire is bent into the form of a circle, what will be the area of the circle? [Take $\pi = \frac{22}{7}$]

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6. The length of a chain used as the boundary of a semicircular park is $108m$. Find the area of the park.

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7. The sum of the radii of two circles is 7 cm, and the difference of their circumferences is 8 cm. Find the circumferencs of the circles.

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8. Find the area of a ring whose outer and inner radii are respectively 23 cm and 12 cm.

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9. (i) A path of 8 m width runs around the outside of a circular park whose radius is 17 m. Find the area of the path.

(ii) A park of the shape of a circle of diameter 7m. It is surrounded by a path of width of 0.7 m. Find the expenditure of cementing the path, if its cost is Rs. 110 per sq m.

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10. A race track is in the form of a ring whose inner circumference is 352 m, and the outer circumference is 396 m. Find the width of the track.

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11. A sector is cut off from a circle of radius 21 cm. The angle of the sector is 120°. Find the length of its arc and the area.

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12. A chord PQ of a circle of radius 10 cm makes an angle of 60° at the centre of the circle. Find the area of the major and the minor segment

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13. The length of an arc of a circle, subtending an angle of 54° at the centre is 16.5cm. Calculate the radius, circumference and area of the circle.

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14. The radius of a circle with centre O is 7 cm. Two radii OA and OB are drawn at right angles to each other. Find the areas of minor and major segments.

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15. Find area of the minor segment formed by a chord $12cm$ long in a circle of radius $12cm$. [use $\pi = 3.14, \sqrt{3} = 1.732$]

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16. A chord 10cm long is drawn in a circle whose radius is $5\sqrt{2}$ cm. Find the area of both the segments.

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17. Find the area of both the segments of a circle of raidus 42 cm with central angle 120°. [Given $\sin 120^\circ = \frac{\sqrt{3}}{2}$ and $\sqrt{3} = 1.73$]

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18. A chord of a circle of radius 30 cm makes an angle of 60° at the centre of the circle. Find the areas of the minor and major segments. [Take $\pi = 314$ and $\sqrt{3} = 1.732$]

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19. In a circle of radius 10.5cm the minor arc is one-fifth of the major arc. Find the area of the sector corresponding to the major arc.

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20. The short and long hands of a clock are 4cm and 6cm long respectively. Find the sum of distances travelled by their tips in 2 days. $\left(Take \pi \frac{22}{7}\right)$

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21. Find the area of a quadrant of a circle whose circumference is 88 cm.

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22. A rope by which a cow is tethered is increased from 16 m to 23 m. How much additional ground does it have now to graze?

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23. A horse is placed for grazing inside a rectangular field 70m by 52m and is tethered to one corner by a rope 21m long. On how much area can it graze?

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24. A horse is tethered to one corner of a field which is in the shape of an equilateral triangle of side 12 m. If the length of the rope is 7m, find the area of the field which the horse cannot graze. Take $\sqrt{3} = 1.732$. Write the answer correct to 2 places of decimal.

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25. Four cows a tethered at the four corners of a square field of side 50 m such that each can graze the maximum unshared area. What area will be left ungrazed ? [Take $\pi = 3.14$]

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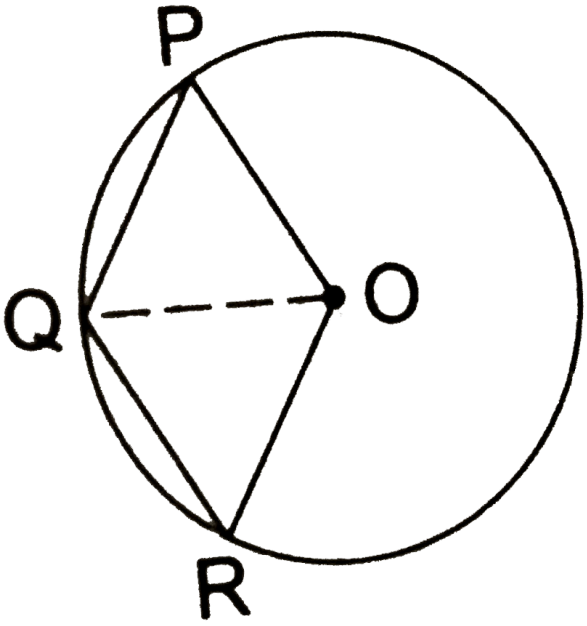
26. In the given figure $OPQR$ is a rhombus, three of whose vertices lie on a circle with centre O. If the ara of the rhomus is $32\sqrt{3}cm^2$, find the radius of

the circle.



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27. The side of a square is 10 cm. Find the area of circumscribed and inscribed circles.

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28. If a square is inscribed in a circle, find the ratio of the areas of the circle and the square.

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29. The area of a circle inscribed in an equilateral triangle is $154\,cm^2$. Find the perimeter of the triangle. $[Use\ \pi = 22/7 and\ \sqrt{3} = 1.73]$

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30. The radius of the wheel of a vehicle is 42 cm. How many revolutioins will it complete in a 19.8-km-long journey?

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31. The wheels of the locomotive of a train are 2.1 m in radius. They make 75 revolutions in one minute. Find the speed of the train in km per hour.

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32. The wheels of a car make 2500 revolutions in covering a distance of 4.95 km. Find the diameter of a wheel.

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33. A boy is cycling such that the wheels of the cycle are making 140 revolutions per minute. If the diameter of the wheel is 60 cm, calculate the speed per hour with which the boy is cycling.

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34. 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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35. The diameters of the fron and rear wheels of a tractor are 80 cm and 2 m respectively. Find the number of revolutions that a rear wheel makes to cover the distance which the front wheel covers is 800 revolutions.

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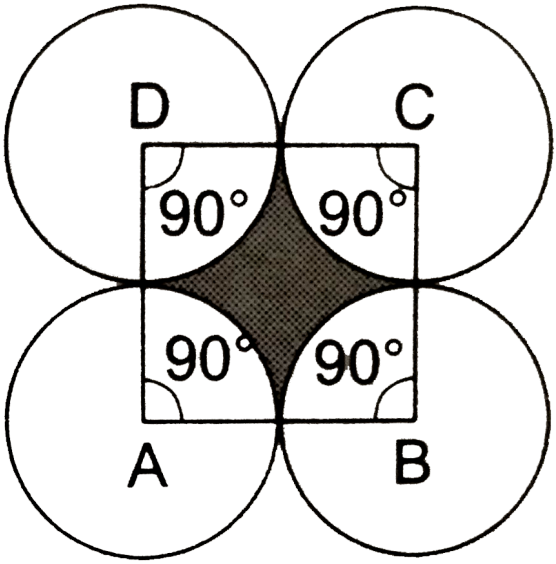
36. Four equal circles are described about the four corners of square so that each touches two of the others, as shown in the figure. Find the area of the shaded region, if each side of the square measures 14 cm.



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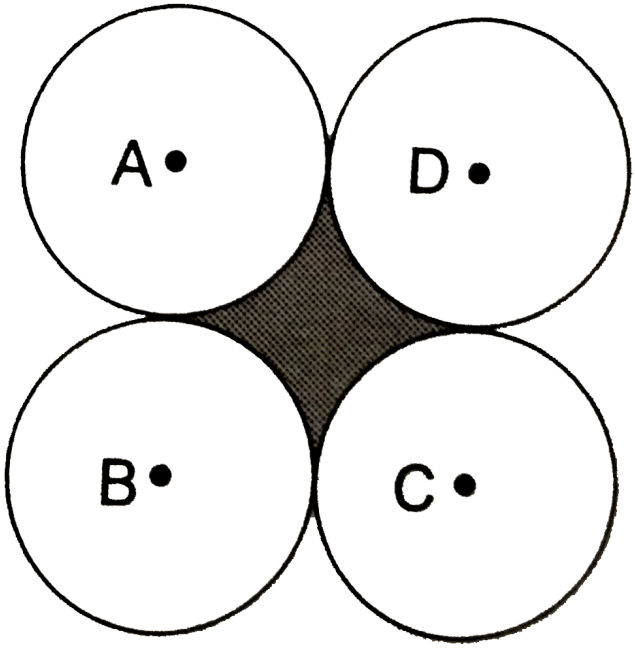
37. Four equal circles each of radius 5 cm, touch each other, as shown in the figure. Find the area included between them.

[Take $\pi = 3.14$]



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38. Four circles each of radius $'a'$ units touch one another. The area enclosed between them in square units is $\frac{a^2}{7}$ (b) $3a^2$ (c) $\frac{6a^2}{7}$ (d) $\frac{41a^2}{7}$

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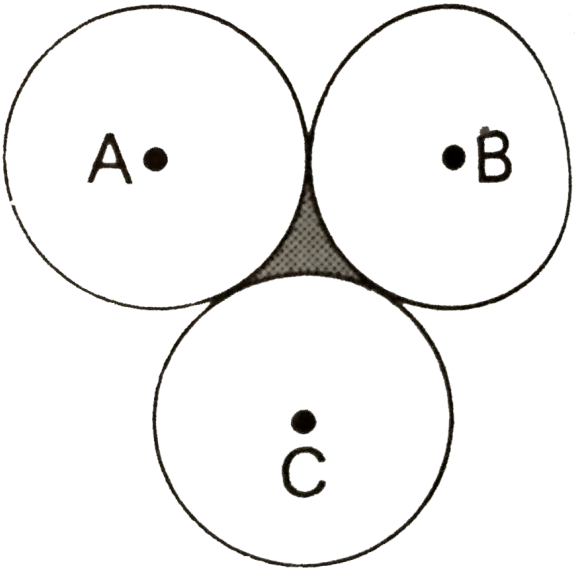
39. Three equal circles, each of radius 6 cm, touch one another as shown in the figure. Find the area enclosed between them.

[Take $\pi = 3.14$ and $\sqrt{3} = 1.732$]



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40. If three circles of radius a each are drawn such that each touches the other two, prove that the

area included between them is equal to $\frac{4}{25}a^2$.

[Take $\sqrt{3} = 1.73$ and $\pi = 3.14$]

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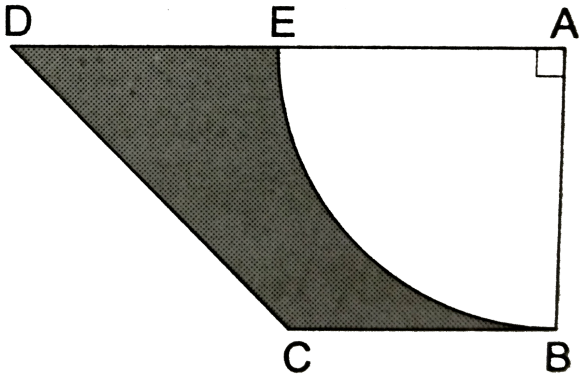
41. In the given figure ABCD s a trapezium of area $24.5cm^2$. If $AD \| BC, \angle DAB = 90^\circ, AD = 10cm, BC = 4cm$ and ABE is quadrant of a circle then find the area of

the shaded region.



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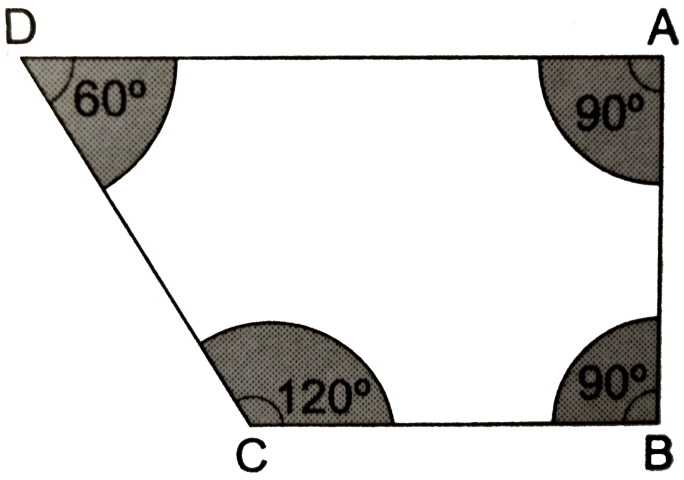
42. ABCD is a field in the shape of a trapezium, $AD \| BC, \angle ABC = 90^\circ$ and $\angle ADC = 60^\circ$. For sectors are formed with centres A,B,C and D, as shown in the figure. The radius of each sector is 14 m. Find the following:



(i) Total area of the four sectors,

(ii) area of the remaining portion, given that $AD = 55m$, $BC = 45m$ and $AB = 30m$.

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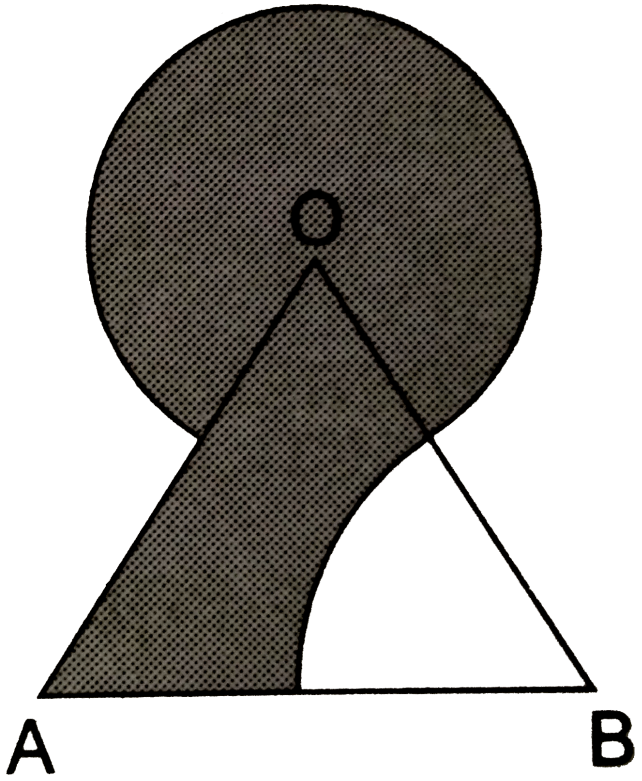
43. Find the area of the shaded region in the given figure, where a circular of arc of radius 6 cm has

been drawn with vertex of an equilateral triangle of side 12 cm as centre and a sector of circle of radius 6 cm with centre B is made. [Use $\sqrt{3} = 1.73$ and $\pi = 3.14$]



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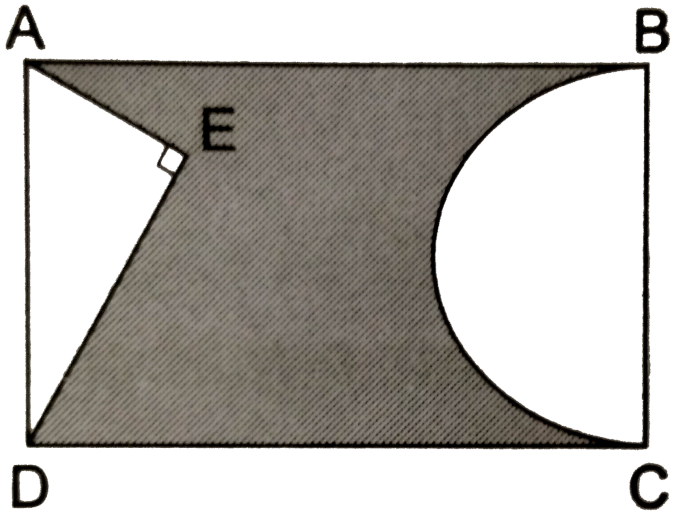
44. In the given figure, ABCD is a rectangle with $AB = 80cm$ and $BC = 70cm$, $\angle AED = 90^\circ$ and $DE = 42cm$. A semicirle is drawn, taking BC a diameter. Find the area of the shaded region.



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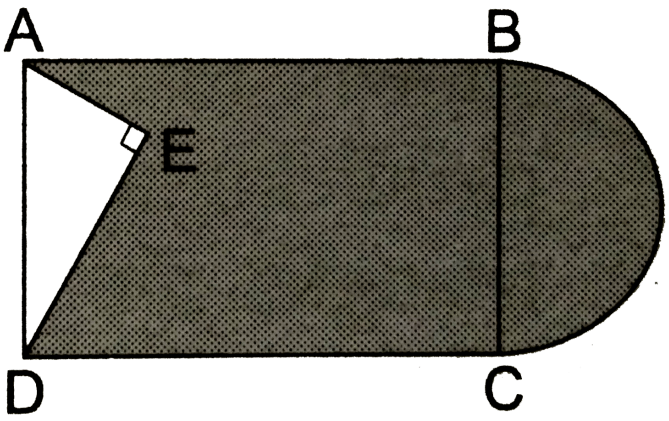
45. In the given figure, from a rectangular region ABCD with $AB = 20cm$ a right triangle AED with $AE = 9cm$ and $DE = 12cm$, is cut off. On the other end, taking BC as diameter, a semicircle is added on outside the region. The area of the shaded region.

[Use $\pi = 3.14$]



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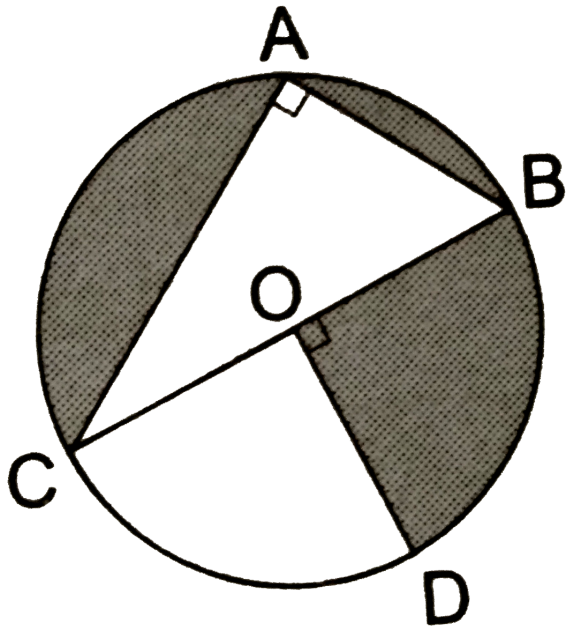
46. In the given figure O is the centre of the circle with $AC = 24cm$, $AB = 7cm$ and $\angle BOD = 90^\circ$. Find the area of shaded region.

[Use $\pi = 3.14$]



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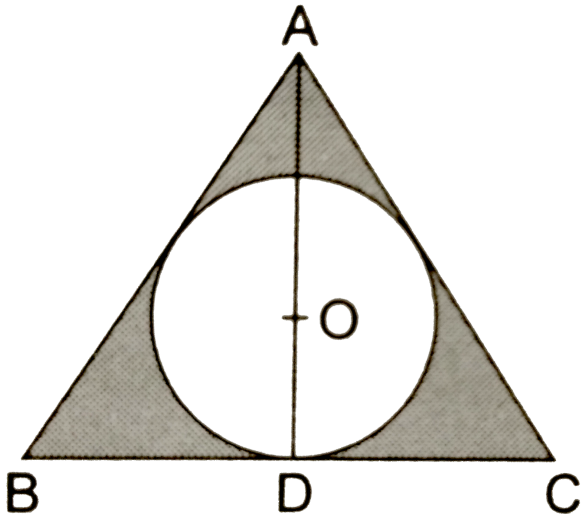
47. In the given figure, a circle is inscribed in an equilateral triangle ABC of side 12 cm. Find the radius of inscribed circle and the area of the shaded region. [Use $\sqrt{3} = 1.73$ and $\pi = 3.14$]



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48. The perimeter of the quadrant of a circle is 25 cm. Find the area.

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49. A chord of a circle of radius 10 cm subtends a right angle at the centre. The area of the minor segments (given $\pi = 3.14$) is

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50. The radius of a circular garden is 100m. There is a road 10m wide, running all around it. Find the

area of the road and the cost of levelling it at Rs. 20 per m^2. [Use $p = 3.14$]

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51. The area of an equilateral triangle is $49\sqrt{3}cm^2$. Taking each angular point as shown in Figure. Find the area of the triangle not included in the circle.

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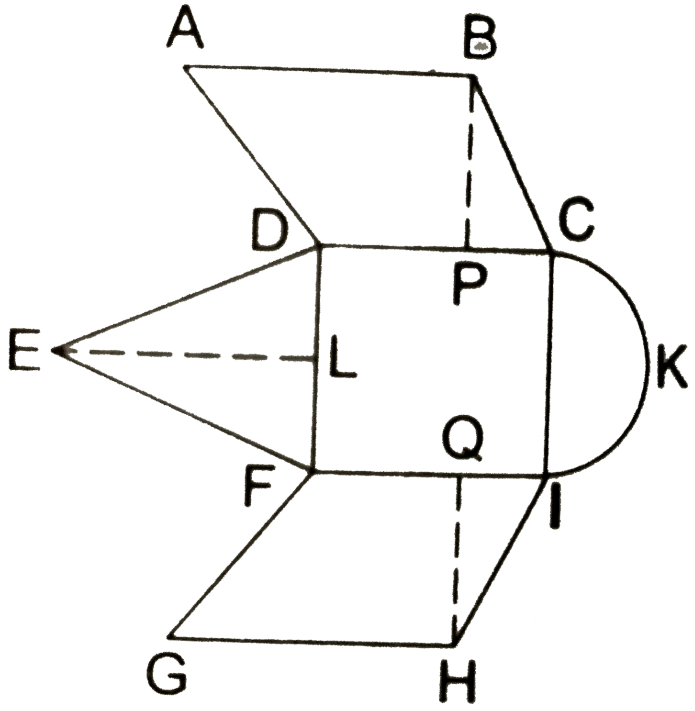
52. A child draws the figure of an aeroplane as shown. Here, the wings ABCD and FGHI are

parallelograms, the tail DEF is an isosceles triangle, the cockpit CKI is a semicircle and CDFI is a square. In the given figure, $BP \perp CD, HQ \perp FI$ and $EL \perp DF$. If $CD = 8cm, BP = HQ = 4cm$ and $DE = EF = 5cm$, find the area of the whole figure. [Take $\pi = 3.14$]



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53. A circular disc of radius 6 cm is divided into three sectors with central angles $90^\circ, 120^\circ$ and 150°. What part of the whole circle is the sector with central angle 150°? Also, calculate the ratio of the areas of the three sectors.

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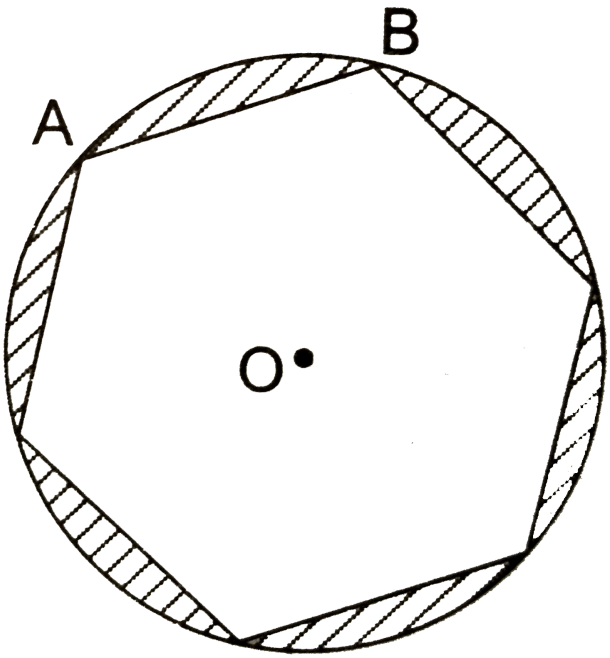
54. A round table cover has six equal designs as shown in the given figure. If the radius of the cover is 35 cm then find the total area of the design. [Use

$\sqrt{3} = 1.732$ and $\pi = 3.14$]



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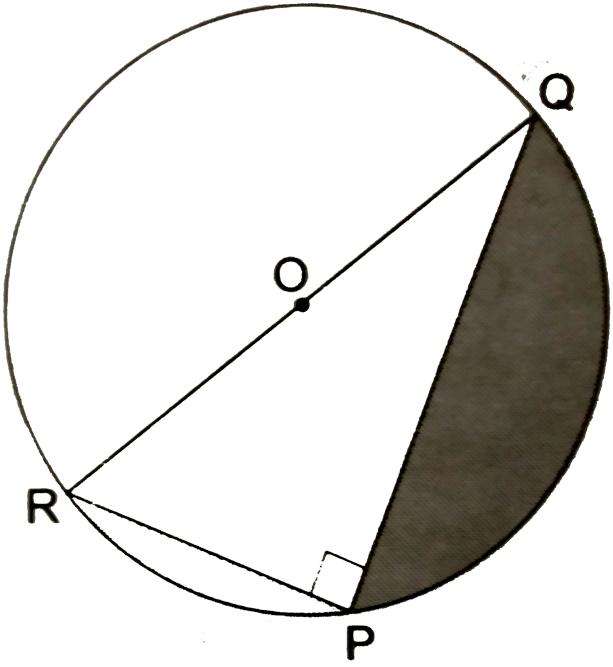
55. In the given figure $PQ = 24cm, PR = 78cm$ and O is the centre of the circle. Find the area of

the shaded region. [Take $\pi = 3.14$]



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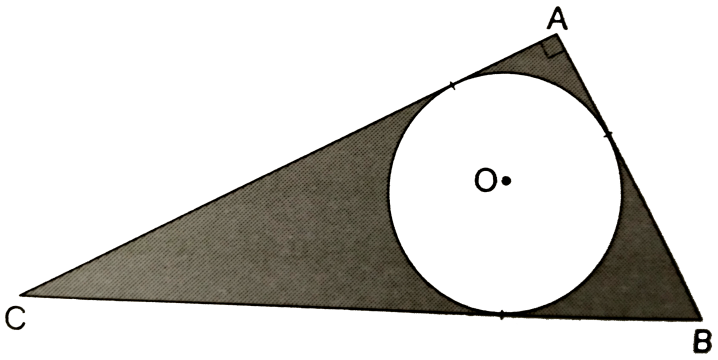
56. In the given figure, ΔABC is right angled at A. Find the area of the shaded region if $AB = 6cm$, $BC = 10cm$ and O is the centre of the

incircle of ΔABC. [Take $\pi = 3.14$]



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57. In the given figure ΔABC is right angled at A. Semicircles are drawn on AB, BC and AC as diameters. It is given that AB=3 cm and AC=4cm then find the area of the shaded region

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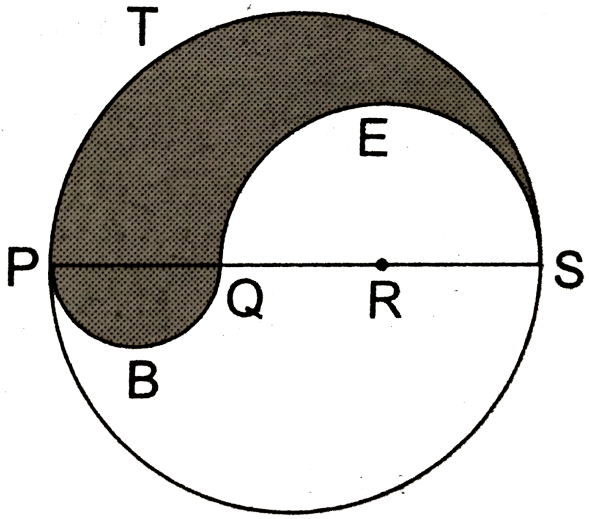
58. PQRS is a diameter of a circle of radius 6cm. The lengths PQ,QR and RS are equal. Semicircles are drawn with PQ and QS is diameters, as shown in the given figure. If $PS = 12cm,$ find the perimeter and area of the shaded region.



[Take $\pi = 3.14$]

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59. The inside perimeter of a running track (shown in figure) is 400m. The length of each of the straight portion is 90m and the ends are semi-circles. If the track is everywhere 14m wide, find the area of the track. Also find the length of the outer running track.

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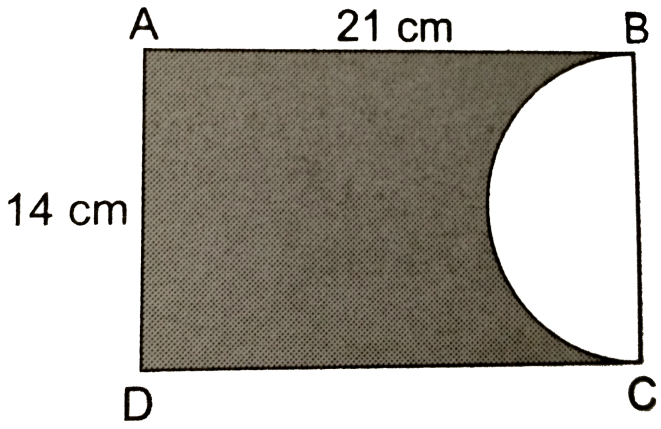
60. In the given figure ABCD is a rectangle of dimensions $21cm \times 14cm$. A semicircle is drawn with BC as diameter. Find the area and the

perimeter of the shaded region in the figure.



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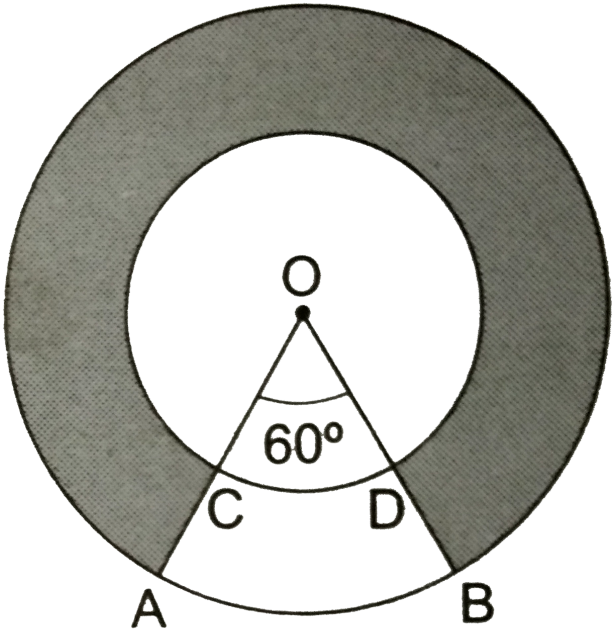
61. In the given figure, two concentric circles with centre O have radii 21 cm and 42 cm. If

$\angle AOB = 60^\circ$ find the area of the shaded region.



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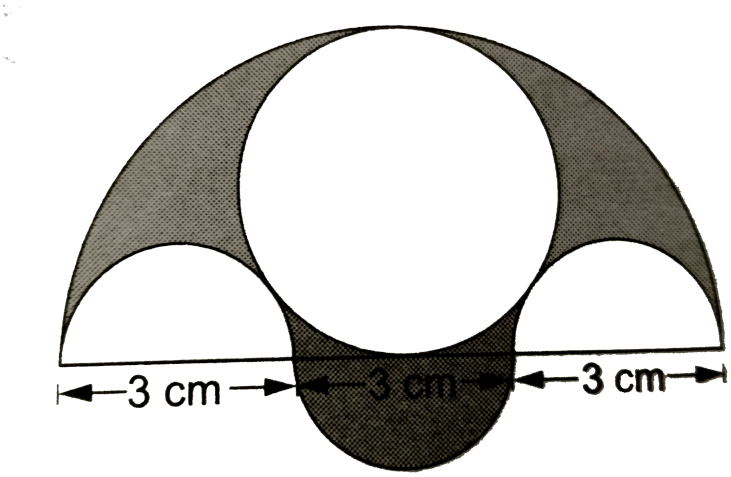
62. Three semicirles each of diameter 3 cm, a circle of diameter 4.5 cm and a semicircle of radius 4.5 cm are drawn in the given figure. Find the area of the

shaded region.



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63. In the given figure, the side of square is 28 cm and radius of each circle is half of the length of the sides of the square where O and O are centres of the circles. Find the area of shaded region

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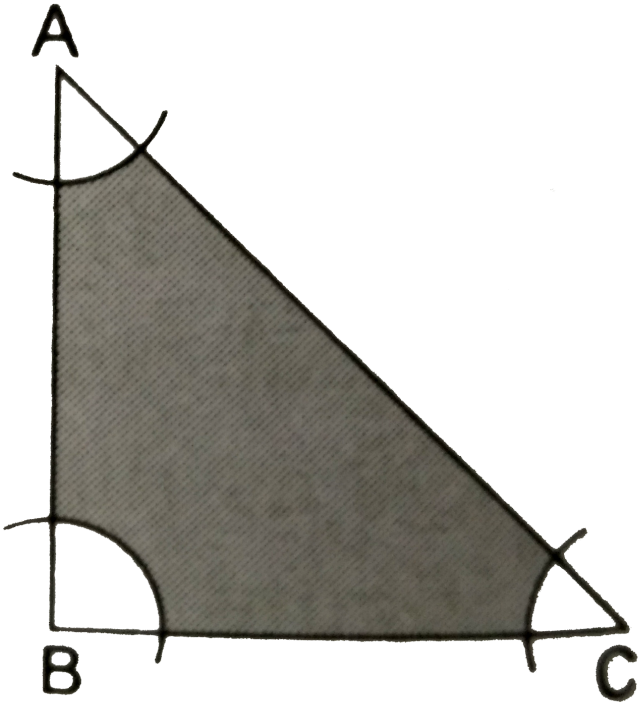
64. With the vertices A,B and C of a triangle ABC as centres, arcs are drawn with radii 5 cm each as shown in the given figure. If $AB = 14cm, BC = 48cm$ and $CA = 50cm$ then

find the area of the shaded region. [Use $\pi = 3.14$]



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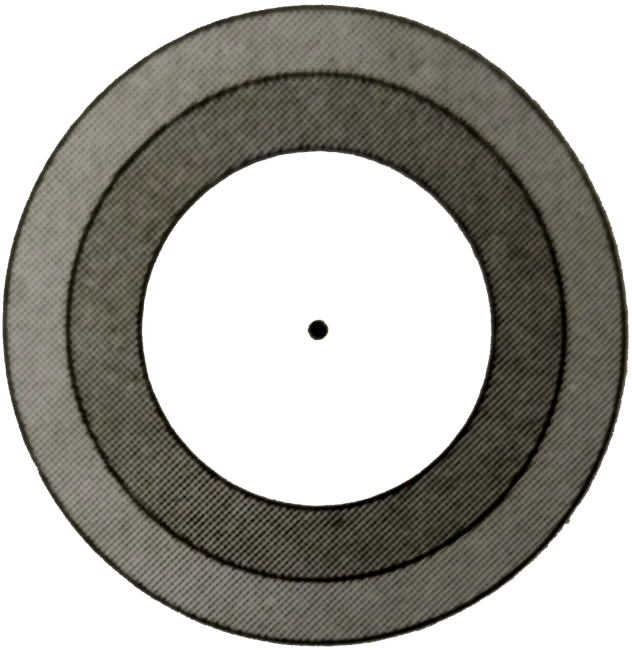
65. If the diameters of the concentric circles shown in the figure below are in the ratio $1:2:3$ then find

the ratio of the areas of three regions.



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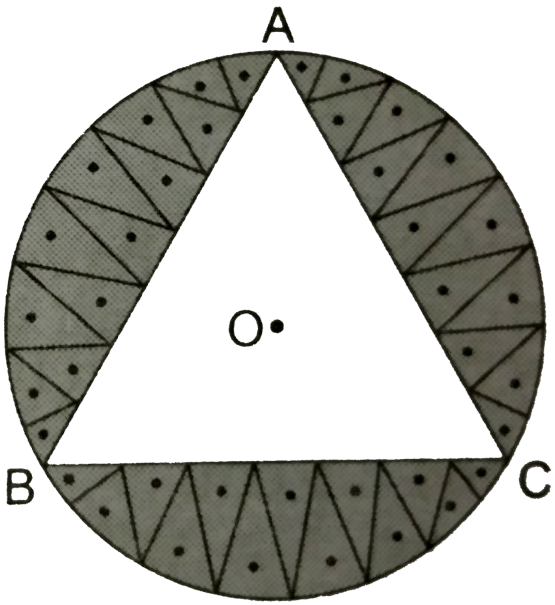
Exercise

1. In a circulat table cover of radius 42 cm, a design is formed, leaving an equilateral triangle ABC in the middle as shown in the figure.

Find the area of the design. [Use $\sqrt{3} = 1.73$]



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Exercise 16 B

1. The difference between the circumference and radius of a circle is 37cm. Using $\pi = \frac{22}{7}$, find the circumference of the circle.

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2. The circumference of a circle is 22 cm. Find the area of its quadrant.

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3. What is the diameter of a circle whose area is equal to the sum of the areas of two circles of diameters 10 cm and 24 cm?

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4. If the area of a circle is numerically equal to twice its circumference, then what is the diameter of the circle?

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5. The perimeter (in cm) of a square circumscribing a circle of radius a cm,

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6. Find the length of the arc of a circle of diameter 42 cm which subtends an angle of 60° at the centre.

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7. Find the diameter of the circle whose area is equal to the sum of the areas of two circles having radii 4 cm and 3 cm.

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8. Find the area of a circle whose circumference is 8π

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9. If the diameter of a semicircular protractor is 14 cm, then find its perimeter.

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10. If the perimeter of a circle is numerically equal to its area, find the radius of the circle.

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11. The radii of two circles are 19 cm and 9 cm respectively. Find the radius and area of the circle

which has its circumference equal to the sum of the circumferences of the two circles.

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12. 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 the areas of the two circles.

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13. Find the area of the sector of a circle having radius 6 cm and of angle 30°. [Take $\pi = 3.14$]

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14. In a circle a radius 21 cm. An arc subtends an angle 60° at the centre (i) the length of an arc. (ii) are of the sector formed by the arc (iii) the area of the segment made by this arc.

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15. The circumferences of two circles are in the ratio $2:3$. What is the ratio between their areas?

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16. The area of two circles are in the ratio $4:9$. What is the ratio between their circumferences?

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17. If a square is inscribed in a circle, find the ratio of the areas of the circle and the square.

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18. The circumference of a circle is 8 cm. Find the area of the sector whose central angle is 72°.

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19. A pendulum swing through an angle of 30^0 and describes an arc 8.8 cm in length. Find the length of the pendulum.

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20. The minute hand of a clock is 15cm long. Calculate the area swept by it in 20 minutes. [Take $\pi = 3.14$]

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21. A sector of 56°, cut out from a circle, contains $17.6cm^2$. Find the radius of the circle.

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22. The area of the sector of a circle of radius $10.5cm$ is $69.3cm^2$. Find the central angle of the sector.

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23. The perimeter of a certain sector of a circle of radius 6.5 cm is 31cm. Find the area of the sector.

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24. The radius of a circle is 17.5 cm. Find the area of the sector enclosed by two radii and an arc 44 cm in length.

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25. Two circlular pieces of equal radii and maximum area, touching each other are cut out from a rectangular cardboard of dimensions $14cm \times 7cm$. Find th area of the remaining cardboard.

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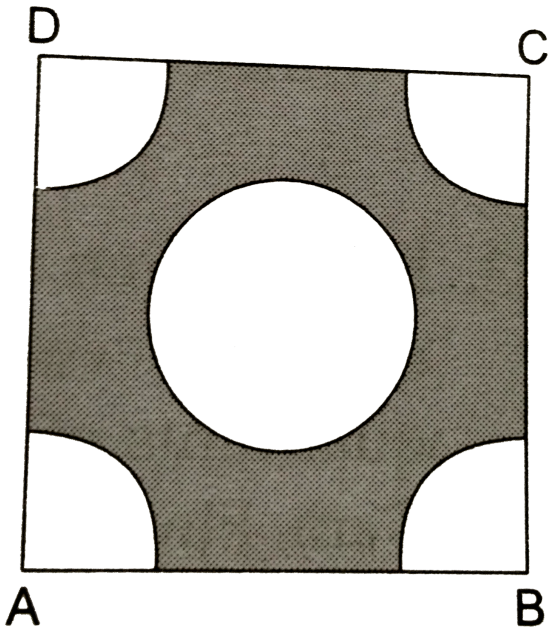
26. In the given figure ABCD is a square of side 4cm. A quadrant of a circle of radius 1 cm is drawn at each vertex of the square and a circle of diameter 2 cm is also drawn. Find the area of the shaded region.

[Use $\pi = 3.14$]



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27. From a rectangular sheet of paper ABCD with AB=40CM and AD=28cm, a semi circular portion with BC as diameter is cut off. Find the area of the remaining paper. $\left(Use\pi = \frac{22}{7}\right)$

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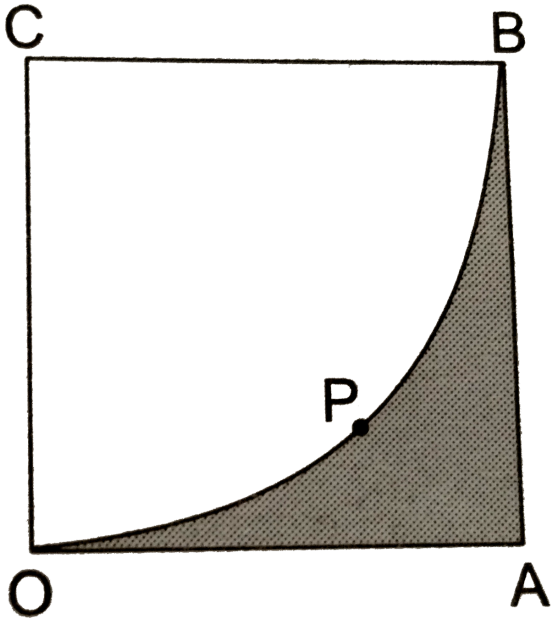
28. In the given figure, OABC is a square of side 7cm. If COPB is a quadrant of a circle with centre C find

the area of the shaded region.



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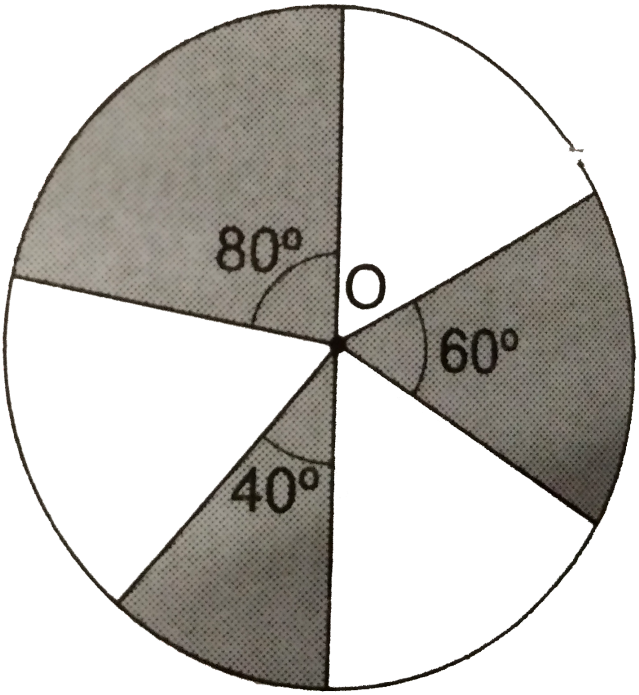
29. In the given figure, three sectors of a circle of radius 7 cm, making angle sof 60°, 80° and 40° at the centre are shaded. Find the area of the shaded

region.



A. $57cm^2$

B. $77cm^2$

C. $71cm^2$

D. None

Answer: B

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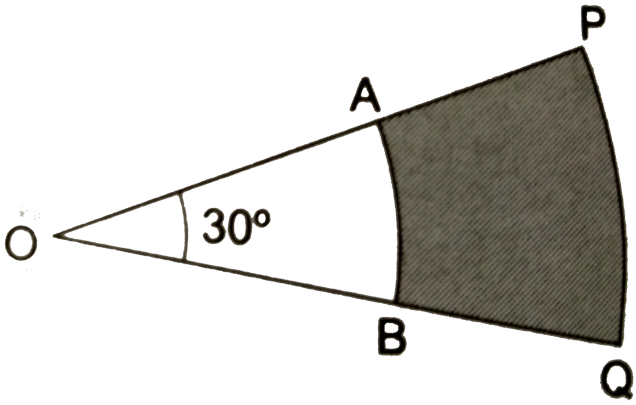
30. In the given figure PQ and AB are respectively the arcs of two concentric cicles of radii 7 cm and 3.5 cm with centre O. If $\angle POQ = 30^\circ$, find the area of the shaded region.



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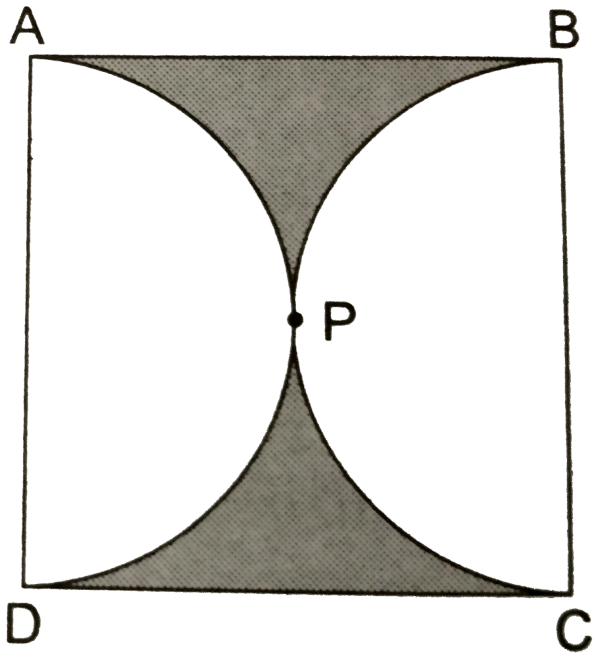
31. In the given figure, find the area of shaded region if ABCD is a square of side 14cm and APD and BPC are semicircles.



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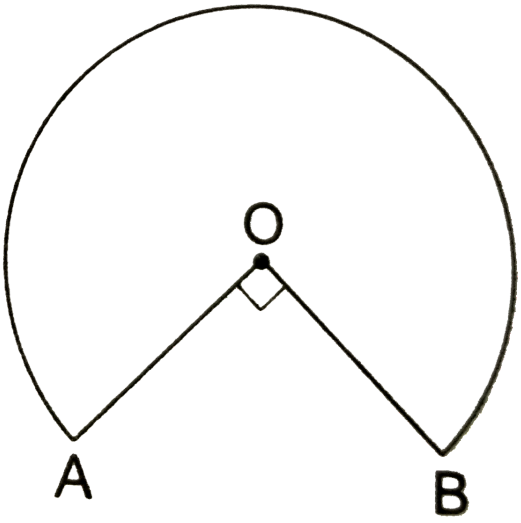
32. In the given figure, the shape of the top of a table is that of a sector of a circle with centre O and $\angle AOB = 90^\circ$. If $AO = OB = 42cm$ then find the perimeter of the top of the table.



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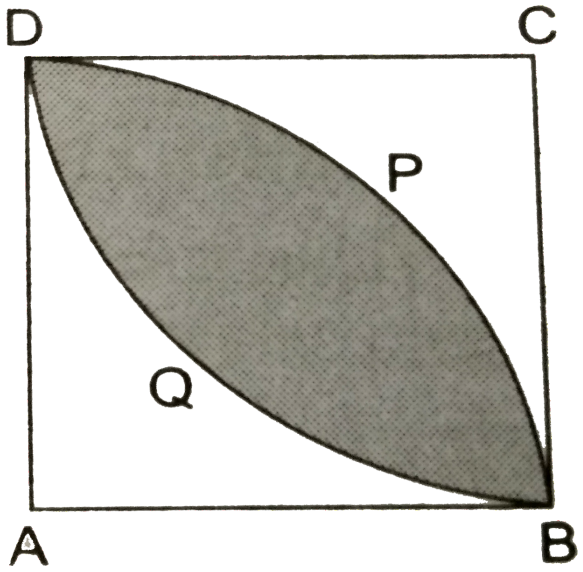
33. In the given figure, ABCD is a square of side 7cm, DPBA and DQBC are quadrants of circles each of the radius 7 cm. Find the area of shaded region.



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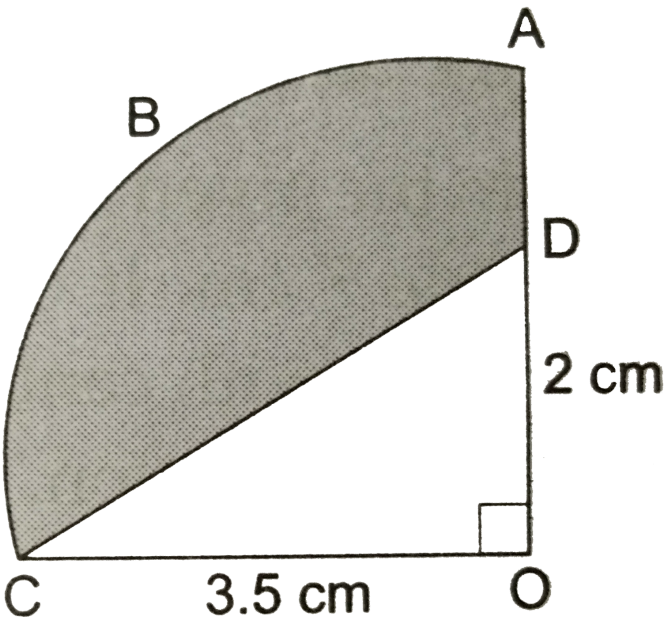
34. In the given figure OABC is a quadrant of a circle with centre O and radius $3.5cm$.If $OD = 2cm$,find the area of the shaded region.



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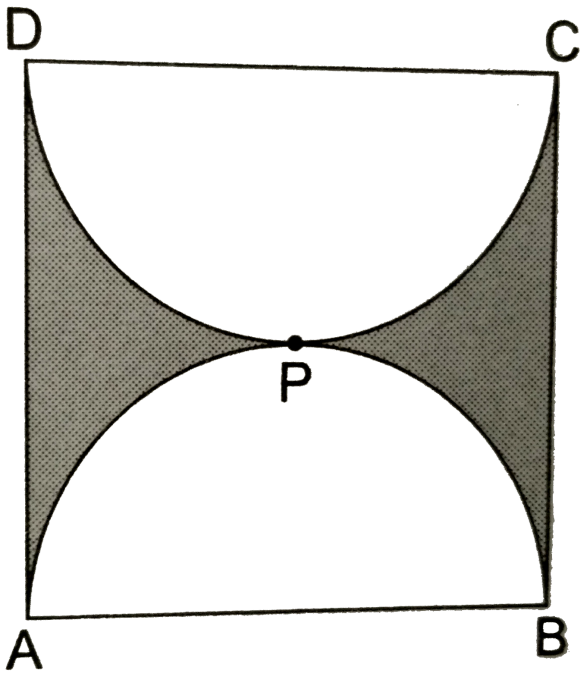
35. Find the perimeter of the shaded region in the figure,if ABCD is a square of side 14 cm and APB and CPD are semicircles.



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36. In a circle of radius 7cm, a square ABCD is inscribed. Find the area of the cirle which is outside the square.

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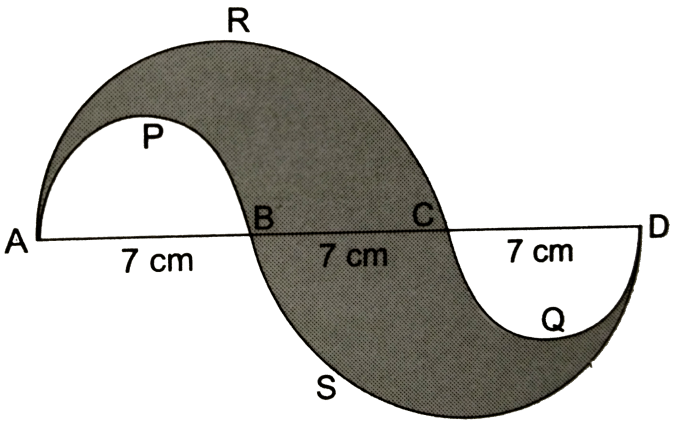
37. In the given figure, APB and CQD are semicircles of diameter 7 cm eachy, while ARC and BSE are semicircles of diameter 14 cm each. Find the (i)

perimeter (ii) area of the shaded region.



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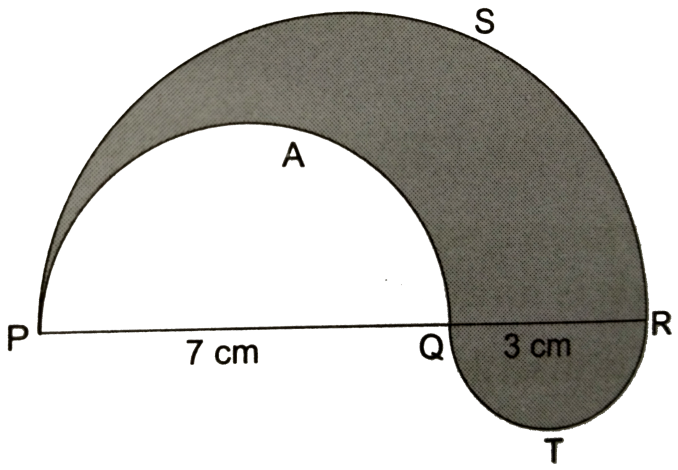
38. In the given figure, PSR, RTQ and PAQ are three semicircles of diameter 10 cm, 3 cm and 7 cm respectively. Find the perimeter of shaded region.

[Use $\pi = 3.14$]



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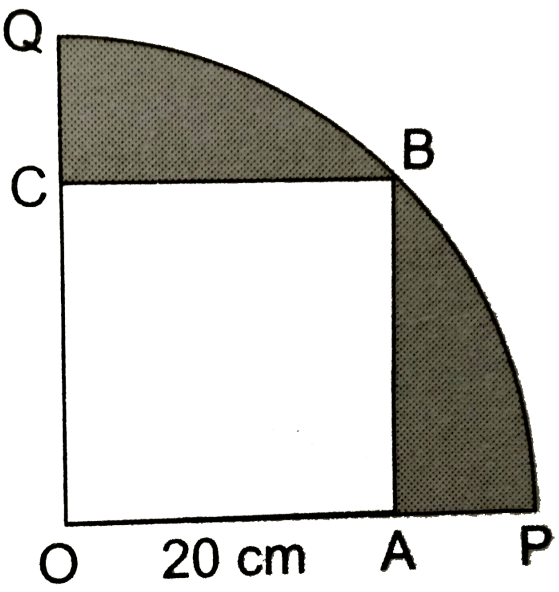
39. In the given figure, a square OABC has been inscribed in the quadrant OPBQ .If $OA = 20cm$ then the area of the shaded region is [take

$\pi = 3.14]$



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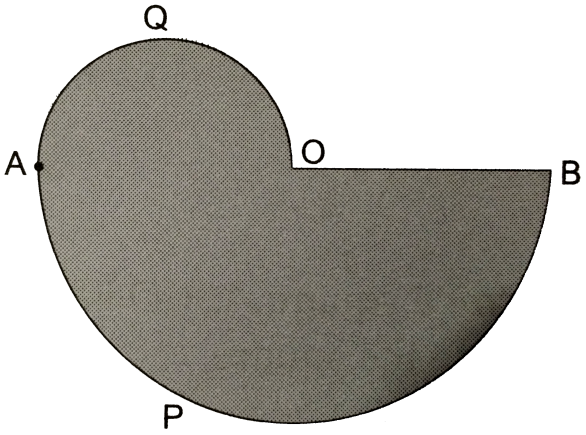
40. In the given figure, APB and AQO are semicircles and $AO = OB$. If the perimeter of the figures is

40cm, find the area of the shaded region.



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41. Find the area of a quadrant of a circle whose circumference is 44 cm.

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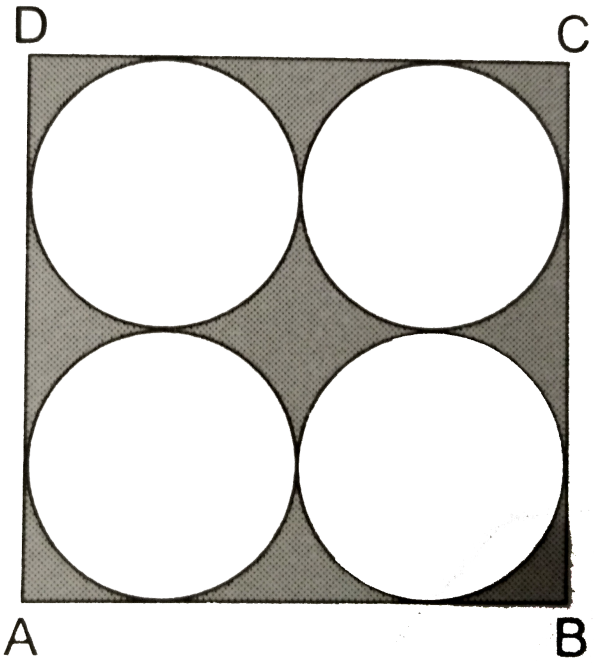
42. In the given figure, find the area of the shaded region, where ABCD is a square of side 14 cm and al circles are of the same diameter.



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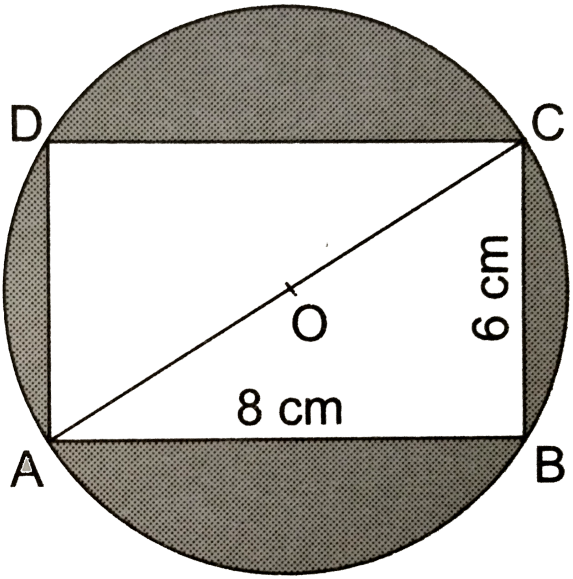
43. Find the area of the shaded region in the given figure, if ABCD is a rectangle with sides 8 cm and 6 cm and O is the centre of the circle.



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44. A wire is bent to form a square enclosing an area of $484m^2$. Using the same wire, a circle is formed. Find the area of the circle.

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45. A square ABCD is inscribed in a circle of radius r. Find the area of the square.

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46. The cost of fencing a circular field at the rate of Rs. 25 per metre is Rs. 5500. The field is to be ploughed at the rate of 50 paise per m^2. Find the cost of ploughing the field. [Take $\pi = \frac{22}{7}$]

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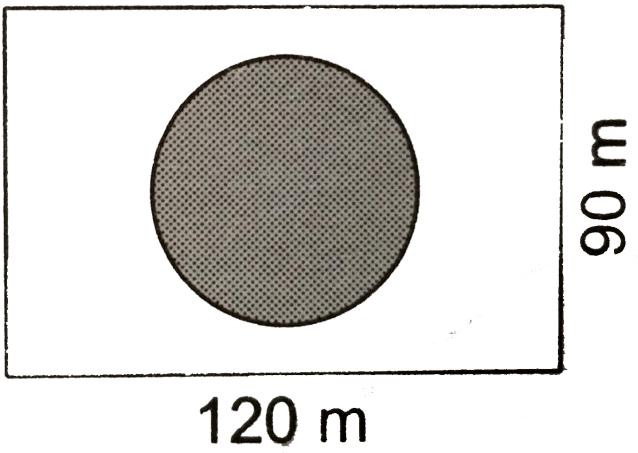
47. A park is in the form of a rectangular 120m by 90 m. At the centre of the park, there is a circular lawn as shown in the figure. The ara of the park excluding the lawn is $2950m^2$. Find the radius of the

circular law. [Given $\pi = 3.14$]



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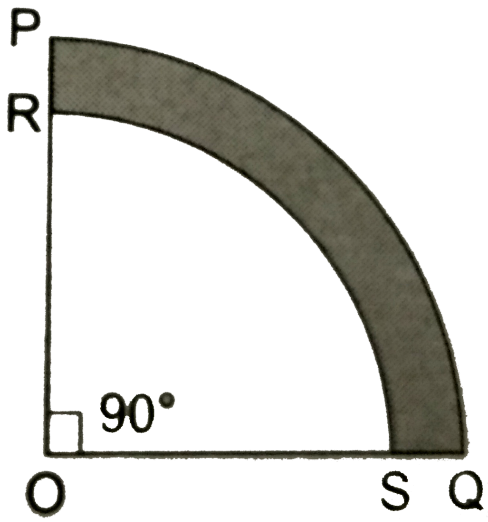
48. In the given figure, PQSR represents a flower bed. If $OP = 21m$ and $OR = 14m$, find the area of

the flower bed.



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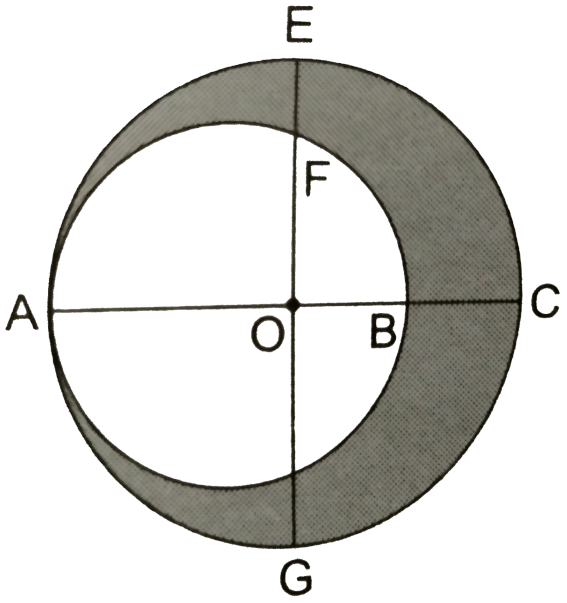
49. In the given figure, O is the centre of the bigger circle, and AC is its diamter. Another circle with AB as diameter is drawn. If $AC = 54$ cm and $BC = 10$,

cm, find the area of the shaded region.



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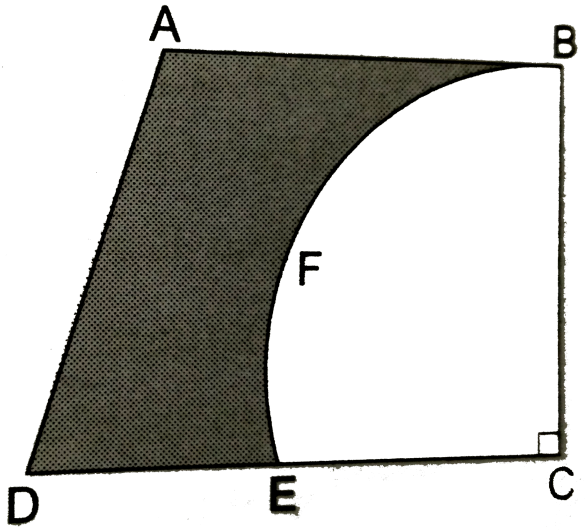
50. From a thin metallic piece in the shaped of a trapezium ABCD in which $AB \| CD$ and $\angle BCD = 90^\circ$,a quarter circle BFEC is removed.

Given, $AB = BC = 3.5cm$ and $DE = 2cm$ calculate the area of remaining (shaded) part of metal sheet.



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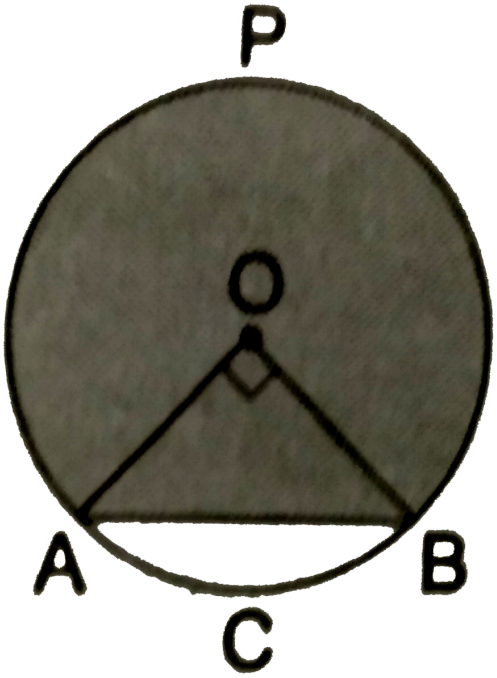
51. Find the area of the major segment APB of a circle of radius 35 cm and $\angle AOB = 90^\circ$ as shown

in the given figure.



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Multiple Choice Questions Mcq

1. The area of a circle is $38.5cm^2$ The circumference of the circle is

A. 6.2cm

B. 12.1cm

C. 11cm

D. 22cm

Answer: D

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

A. $7\pi cm$

B. $14\pi cm$

C. $21\pi cm$

D. $28\pi cm$

Answer: B

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

A. $111cm^2$

B. $184cm^2$

C. $154cm^2$

D. $259cm^2$

Answer: C

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

A. $9317m^2$

B. $18634m^2$

C. $4658.5m^2$

D. none of these

Answer: C

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5. On increasing the diameter of a circle by 40% its area will be increased by

A. $40\ \%$

B. $80\ \%$

C. $96\ \%$

D. 82%

Answer: C

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6. On decreasing the radius of a cirlce by 30% its area is decreased by

A. 30%

B. 60%

C. 45%

D. none of these

Answer: D

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7. The area of a circle is the same as the area of a square. Their perimeters are in the ratio

A. $1:1$

B. $2:\pi$

C. $\pi:2$

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

Answer: D

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

A. $16cm$

B. $28cm$

C. $42cm$

D. $56cm$

Answer: B

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

A. 25cm

B. 31 cm

C. 50 cm

D. 62 cm

Answer: C

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10. If the perimeter of a square is equal to the circumference of a circle then the ratio of their areas is

A. $4:\pi$

B. $\pi:4$

C. $\pi:7$

D. $7:\pi$

Answer: B

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11. 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. $R_1 + R_2 < R$

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

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

Answer: D

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12. 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. none of these

Answer: A

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13. 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. none of these

Answer: B

 Watch Video Solution

14. The radii of two concentric circles are 19 cm and 16 cm respectively. The area of the ring enclosed by these circles is

A. $320cm^2$

B. $330cm^2$

C. $332cm^2$

D. $340cm^2$

Answer: B

Watch Video Solution

15. The areas of two concentric circles are $1386cm^2$ and $962.5cm^2$.The width of the ring is

A. 2.8cm

B. 3.5cm

C. 4.2cm

D. 3.8cm

Answer: B

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16. The circumferences of two circles are in the ratio $3:4$. The ratio of their areas is

A. $3:4$

B. $4:3$

C. $9:16$

D. $16:9$

Answer: C

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17. The areas of two circles are in the ratio $9:4$.The ratio of their circumferences is

A. $3:2$

B. $4:9$

C. $2:3$

D. $81:16$

Answer: A

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18. The radius of a wheel is 0.25m. How many revolutions will it take in covering 11 km?

A. 2800

B. 4000

C. 5500

D. 7000

Answer: D

Watch Video Solution

19. The diameter of a wheel is 40 cm. How many revolutions will it make in covering 176m?

A. 140

B. 150

C. 160

D. 166

Answer: A

Watch Video Solution

20. In making 1000 revolutioins, a wheel covers 88 km. The diameter of the wheel is

A. 14m

B. 24m

C. 28m

D. 40m

Answer: C

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21. The area of a sector of angle θ° of a circle with radius R is

A. $\frac{2\pi R\theta}{180}$

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

C. $\frac{2\pi R\theta}{360}$

D. $\frac{\pi R^2\theta}{360}$

Answer: D

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22. The length of an arc of a sector of angle θ° of a circle with radius R is

A. $\frac{2\pi R\theta}{180}$

B. $\frac{2\pi R\theta}{360}$

C. $\frac{\pi R^2\theta}{180}$

D. $\frac{\pi R^2\theta}{360}$

Answer: B

Watch Video Solution

23. The length of the minute hand of a clock is 21 cm. The are swept by the minute hand in 10 minutes is

A. $231cm^2$

B. $210cm^2$

C. $126cm^2$

D. $252cm^2$

Answer: A

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24. A chord of a circle of radius $10cm$ subtends a right angle at the centre. The area of the minor segments (given $\pi = 3.14$) is

A. $32.5cm^2$

B. $34.5cm^2$

C. $28.5cm^2$

D. $30.5cm^2$

Answer: C

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25. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. The length of the arc is

A. 21 cm

B. 22 cm

C. 18.16 cm

D. 23.5cm

Answer: B

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26. In a circle of radius 14 cm, an arc subtends an angle of 120° at the centre. If $\sqrt{3} = 1.73$ then the area of the segment of the circle is

A. $120.56cm^2$

B. $124.63cm^2$

C. $118.24cm^2$

D. $130.57cm^2$

Answer: A

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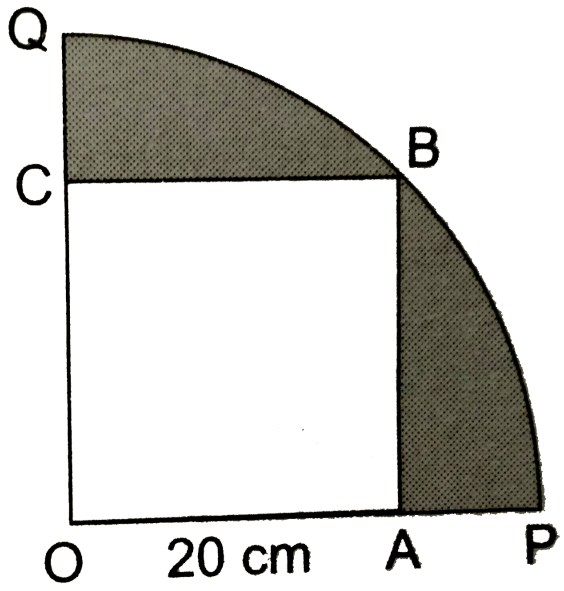
Test Yourself

1. In the given figure, a square OABC has been inscribed in the quadrant OPBQ .If $OA = 20cm$ then the area of the shaded region is [take $\pi = 3.14$]



A. $214cm^2$

B. $228cm^2$

C. $242cm^2$

D. $248cm^2$

Answer: B

Watch Video Solution

2. The diameter of a wheel is 84 cm. How many revolution will it make to cover 792 m ?

A. 200

B. 250

C. 300

D. 350

Answer: NA

Watch Video Solution

3. The area of a sector of a circle with radius r, making an angle of x° at the centre is

A. $\frac{x}{180} \times 2\pi r$

B. $\frac{x}{180} \times \pi r^2$

C. $\frac{x}{360} \times 2\pi r$

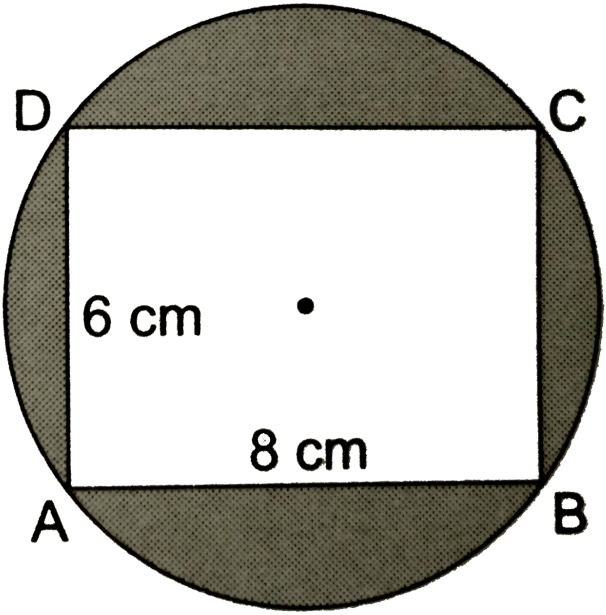
D. $\frac{x}{360} \times \pi r^2$

Answer: NA

Watch Video Solution

4. In the given figure ABCD is a rectangle inscribed in a circle having length 8 cm and breadth 6 cm. If

$\pi = 3.14$ then the area of the shaded region is



A. $264cm^2$

B. $266cm^2$

C. $272cm^2$

D. $254cm^2$

Answer: NA

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5. The circumference of a cirlce is 22 cm. Find its area [Take $\pi = \frac{22}{7}$]

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6. 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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7. The minute hand of a clock is 12 cm long. Find the area swept by it in 35 minutes.

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8. The perimeter of a certain sector of a circle of radius 5.6 m is 27.2 m. Find the area of the sector

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9. A chord of a circle of radius 14 cm makes a right angle at the centre. Find the area of the sector.

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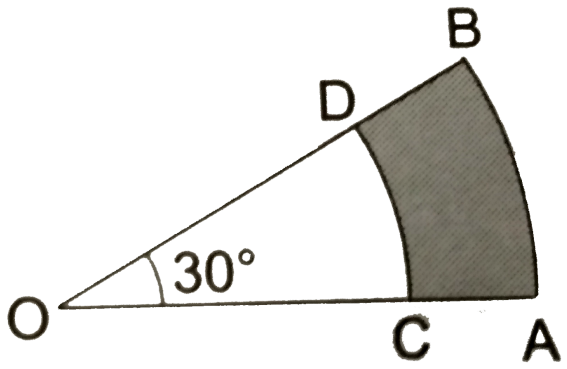
10. In the give figure, the sectors of two concentric circles of radii 7 cm and 3.5 cm are shown. Find the area of the shaded region.



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11. A wire when bent in the form of an equilateral triangle encloses an area of $121\sqrt{3}cm^2$. If the same wire is bent into the form of a circle, what will be the area of the circle? [Take $\pi = \frac{22}{7}$]

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12. The wheel of a cart is making 5 revolutions per second. If the diameter of the wheel is 84 cm, find its speed in km per hour. [Take $\pi = \frac{22}{7}$]

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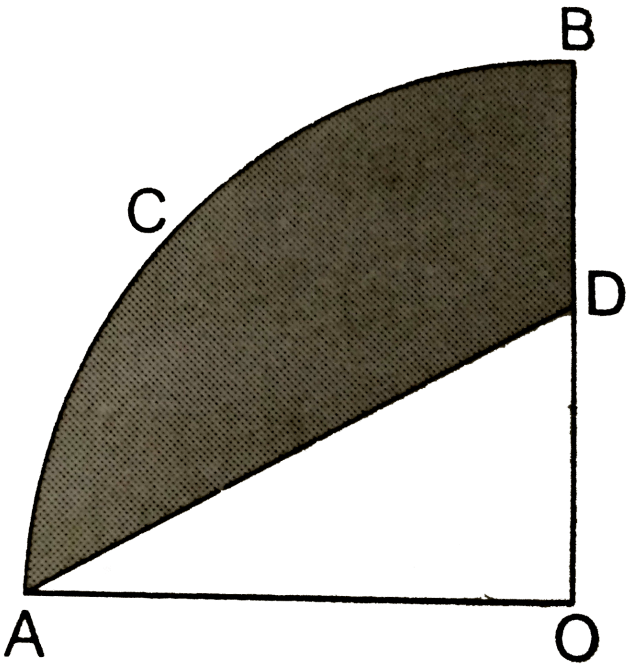
13. OACB is a quadrant of a circle with centre O and its radius is 3.5cm . If $OD = 2cm$, find the area of the shaded region. [Take $\pi = \frac{22}{7}$]



A. 6.225 cm^2

B. 6.125 cm^2

C. 5.125 cm^2

D. none of these

Answer: B

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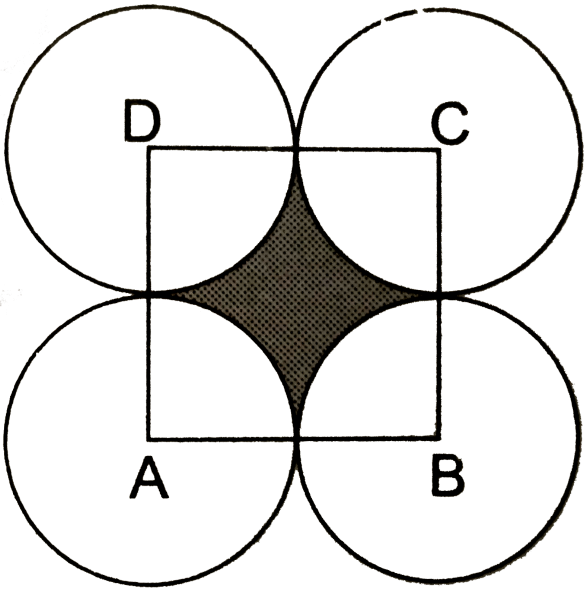
14. In the given figure ABCD is a square each of whose sides measures 28 cm. Find the area of the

shaded region. [Take $\pi = \frac{22}{7}$]



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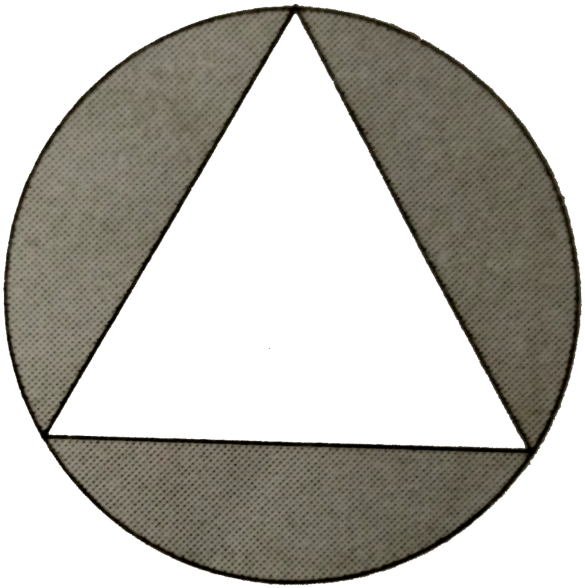
15. In the given figure, an equilateral triangle has been inscribed in a circle of radius 4 cm. Find the area of the shaded region. [Take $\pi = 3.14$ and

$\sqrt{3} = 1.73]$



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16. The minute hand of a clock is 7.5 cm long. Find the area of the face of the clock described by the minute hand in 56 minutes.

A. 165 cm^2

B. 155 cm^2

C. 145 cm^2

D. 135 cm^2

Answer: A

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17. A race track is in the form of a ring whose inner circumference is 352 m and the outer circumference is 396 m. Find the width of the track.

A. 7 m

B. 8 m

C. 9 m

D. 10 m

Answer: A

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18. A chord of a circle of radius 30 cm makes an angle of 60° at the centre of the circle. Find the areas of the major segment. [Take $\pi = 3.14$ and $\sqrt{3} = 1.732$]

A. $2744.4\ cm^2$

B. $2754.4\ cm^2$

C. $3844.4\ cm^2$

D. $81.3\ cm^2$

Answer: A

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19. Four cows a tethered at the four corners of a square field of side 50 m such that each can graze the maximum unshared area. What area will be left ungrazed ? [Take $\pi = 3.14$]

A. 463.51 cm^2

B. 555.51 cm^2

C. 563.51 cm^2

D. 553.51 cm^2

Answer: C

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