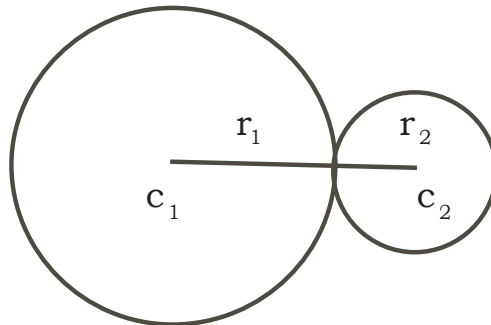# GREENWAY MODERN SCHOOL
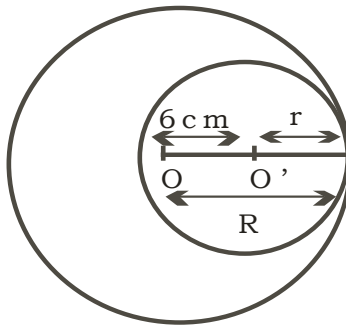
SESSION 2018-2019

CLASS 10TH

SUBJECT-MATHS (AREAS RELATED TO CIRCLES)

Q1. Two circles touch each other externally. The sum of their areas is 130π sq.cm. And distance between their centre is 14cm find radii of circles.

Q2. Two circles touch internally. The sum of their areas is 116π sq.cm and distance between their centre is 6 cm. Find the radii of circles.


Q3. An elastic belt is placed round the rim of a pulley of radius 5 cm. One point on the belt is pulled directly away from centre O of the pulley until it is at P 10 cm from O. find the length of belt that is in contact with rim of pulley.Also, find the shaded area.
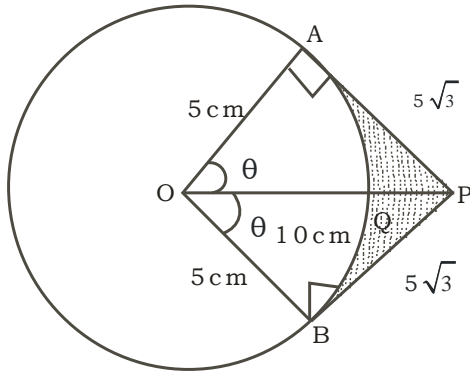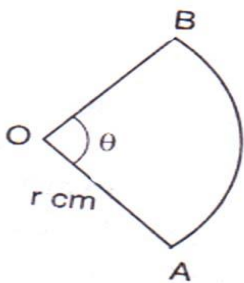
Q4. In the below figure it shows a sector of a circle, centre O containing an angle θ prove that

(i)   Perimeter of the shaded region is $r\left(\tan\theta + \sec\theta + \dfrac{\pi\theta}{180} - 1\right)$

(ii)   Area of shaded region is $\dfrac{r^2}{2}\left(\tan\theta - \dfrac{\pi\theta}{180}\right)$
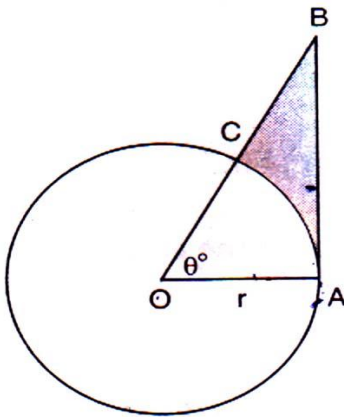
Q5. In the below figure it shows a sector of a circle of radius r cm containing an angle θ. The area of a sector is a sq.cm and perimeter of the sector is 50 cm. prove that

(i) $\theta = \dfrac{360}{\pi}\left(\dfrac{25}{r} - 1\right)$ (ii) A= 25r - r^2

Q6. In the figure two arcs , A and B. Arc A is part of circle with centre O and radius OP. Arc B is part of the circle with centre M and radius PM , where M is the midpoint of PQ.Show that the area enclosed by two arcs is equal to
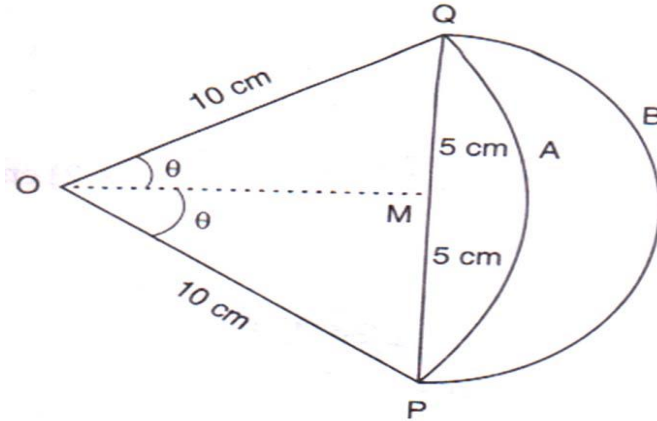
$25\left(\sqrt{3} - \dfrac{\pi}{6}\right)$ sq cm

Q7.AB is diameter of circle, centre O . C is a point on the circumference such that $\angle COB = \theta$. The area of the minor segment cut off by AC is equal to

twice the area of the sector BOC.Prove that $\sin\dfrac{\theta}{2}\cos\dfrac{\theta}{2} = \pi\left(\dfrac{1}{2} - \dfrac{\theta}{120}\right)$
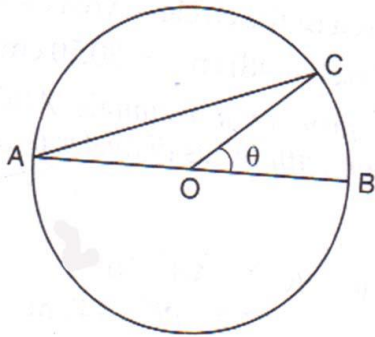

Q8. A chord of a circle subtends an angle of θ at the centre of the circle. The area of minor segment cut off by the chord is one eighth of the area of

the circle. Prove that $8\sin\dfrac{\theta}{2}\cos\dfrac{\theta}{2} + \pi = \dfrac{\pi\theta}{45}$

Q9. Floor of a room is a dimension $5m \times 4m$ and it is covered with circular tiles of diameter 50 cm each as shown in given figure. Find the area of floor that remains uncovered with tiles $(use\ \pi = 3.14)$

5 m

4 m

50 cm
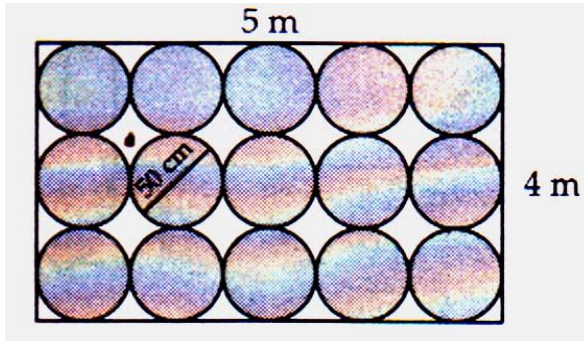
Q10.In the given figure ABC is an equilateral triangle inscribed in a circle of radius 4 cm with centre O. Find the area of shaded region
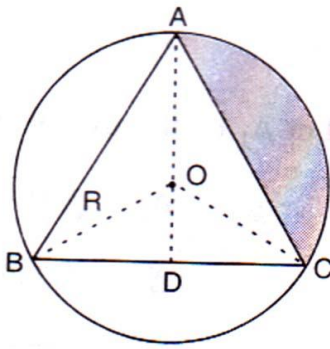
Q11. In an equilateral triangle of side 24 cm , a circle is inscribed touching its sides. Find the area of remaining portion of a triangle($take \sqrt{3}$ = 1.732)
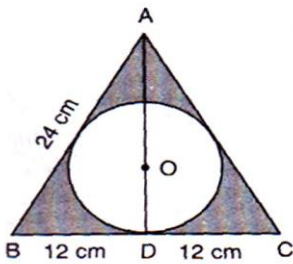

Q12. In the given figure , ABC is a right angle triangle at A . Find the area of the shaded region , if AB = 6cm , BC = 10 cm and I is the centre of incircle of triangle ABC.
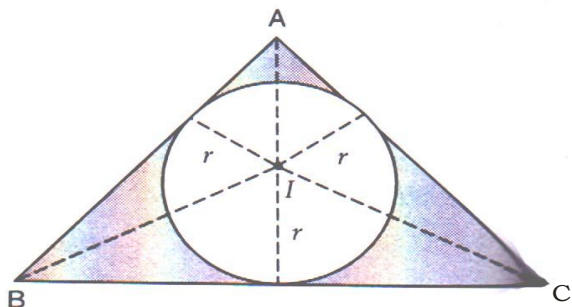
Q13. ABCD is a field in the shape of a trapezium. AB || DC and $\angle ABC = 90$, $\angle DAB = 60$. Four sectors are formed with centers A,B,C,D . the radius of each sector is 17.5 m . Find

(i)   Total area of 4 sectors.
(ii)   Area of remaining portion given that AB = 75 m and CD = 50 m.
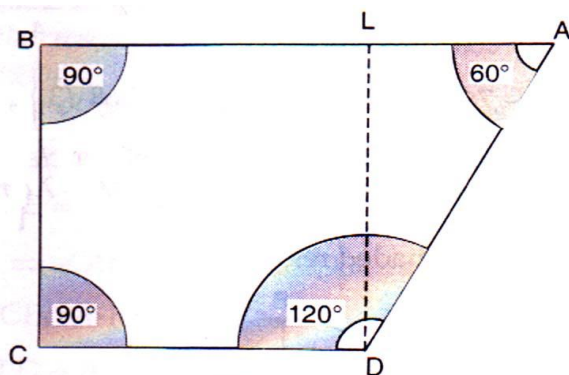

Q14. In given figure a crescent is formed by two circles which touch at A. C is the centre of the larger circle (with centre O) perpendicular to each other and OD is diameter of smaller circle. If OA = 7cm , find area of the shaded region.
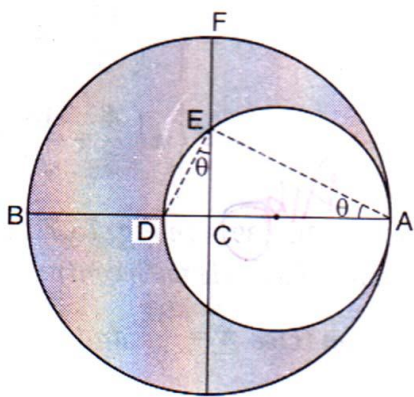
Q15. In the given figure ABCD is a trapezium with AB || DC and $\angle BCD = 60$. If BEFC is a sector of circle with centre C and AB=BC=7cm and DE=4cm , then find the area of shaded region $(Use\ \pi = \dfrac{22}{7}\ and\ \sqrt{3} = 1.732)$

A   B
F
60°
D   E   L   C
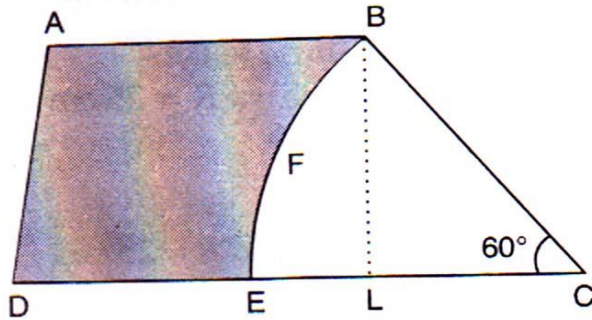
Q16. With vertices A,B and C of a triangle ABC as centers , arcs are drawn with radii 5 cm each as shown in given figure . If AB = 14 cm , BC = 48 cm and CA = 50 cm , then find area of shaded region. $(use\ \pi = 3.14)$

A
50 cm
14 cm
B
48 cm
C
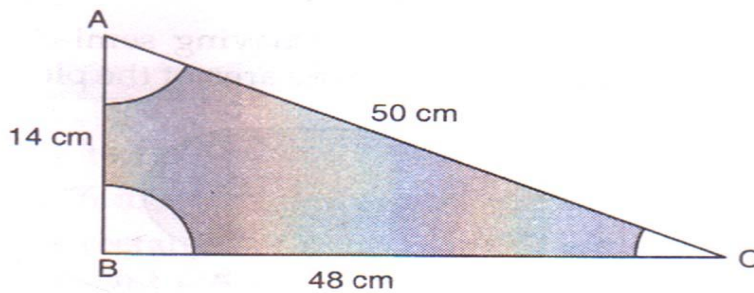
Q17. In the given figure , the square ABCD is divided into 5 equal parts , all having same area. The central part is circular and the lines AE,GC,BF and HD lie along the diagonals AC and BD of the square. If AB = 2 cm , find:

(i)   The circumference of the central part

(ii)   The perimeter of the part ABEF
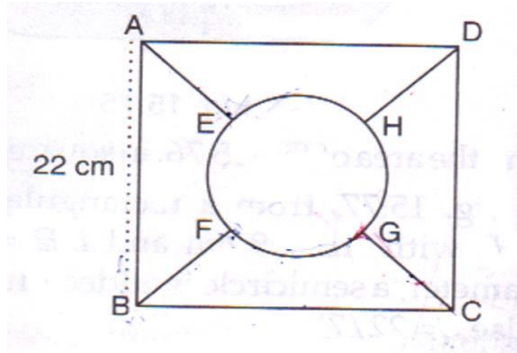
Q18. In the given figure , AB=36 cm and M is the midpoint of AB.Semicircles are drawn on AB, AM and MB as diameters. A circle with centre C touches all the three circles. Find the area of shaded region.
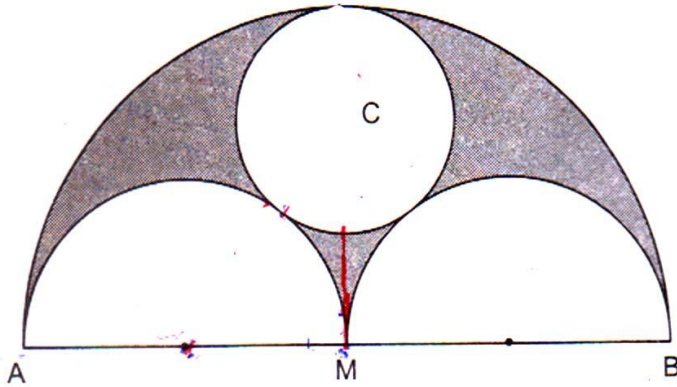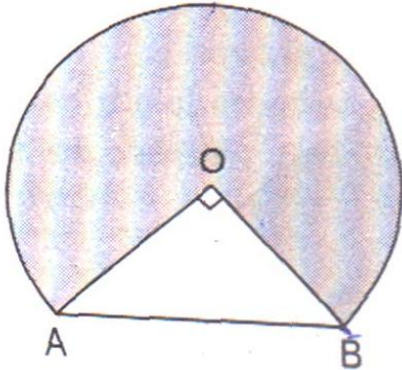

Q19. In the given figure , ABC is a right angled triangle in which $\angle A = 90$, AB = 21 cm and AC = 28 cm. Semicircles are described on AB , BC and AC as diameters. Find the area of shaded region
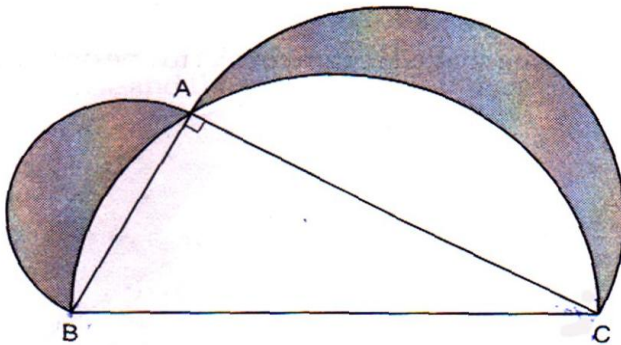
Q20. In the given figure shows cross section of railway tunnel. The radius OA of the circular part is 2 m. If $\angle AOB = 90$ find:

(i)   The height of tunnel

(ii)   The perimeter of cross section

(iii)   Area of cross section

Q21.A path 4 m wide runs round semi-circular grassy plot whose circumference is $163\frac{3}{7}$ m find:

(i)   Area of path

(ii)   Cost of gravelling at rs 1.50sq.m

(iii)   Cost of turfing at 45 paise sq.m