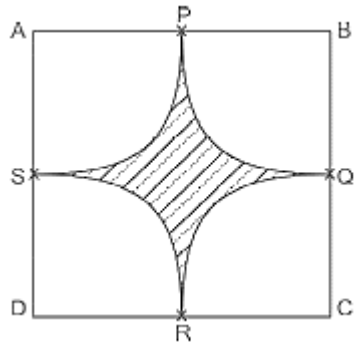
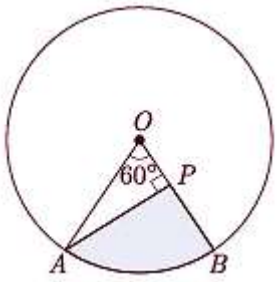
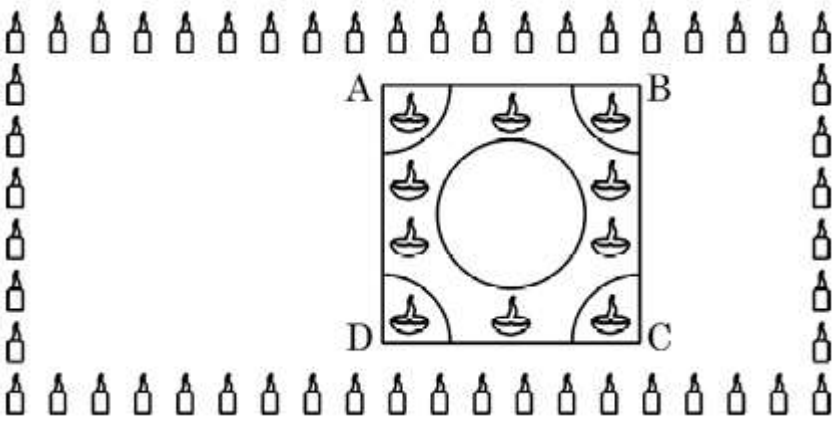
INDIAN SCHOOL AL WADI AL KABIR

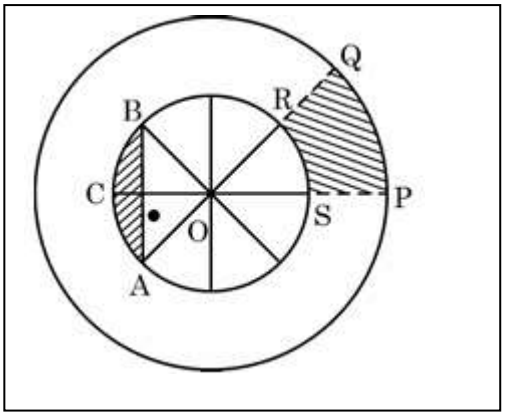
Class X, Mathematics

Worksheet- Areas Related to Circles (DTQ)

17 - 11 - 2024

Q. No.	Questions of 2 Marks each.
1.	A piece of wire 20 cm long is bent into the form of an arc of a circle subtending an angle of 60° at its centre. Find the radius of the circle in terms of π.
2.	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.
3.	Find the length of the arc of a circle which subtends an angle of 60^0 at the centre of the circle of radius 42 cm.
4.	Find the perimeter of the sector of a circle with sector angle 60^0 and radius 10.5 cm.
5.	Find the area of the sector of a circle of radius 5 cm, if the corresponding arc length is 3.5 cm.
	Questions of 3 Marks each.
6.	A chord of a circle of radius 20 cm subtends an angle of 90° at the centre. Find the area of the corresponding major segment of the circle. (Use $\pi = 3.14$).
7.	The diameters of front and rear wheels of a tractor are 80 cm and 2 m respectively. Find the number of revolutions that rear wheel will make in covering a distance in which the front wheel makes 1400 revolutions.
8.	Find the area of the shaded region in Fig. 2, where arcs drawn with centres A, B, C and D intersect in pairs at mid-points P, Q, R and S of the sides AB, BC, CD and DA respectively of a square ABCD of side 12 cm. [Use $\pi = 3.14$] 

9.	A car has two wipers which do not overlap. Each wiper has a blade of length 21cm sweeping through an angle of 120°.Find the area cleaned at each sweep of the blades.
10.	In the given figure, AOB is a sector of angle 60c of a circle with centre O and radius 17 cm. If AP ⊥ OB and AP = 15 cm, find the area of the shaded region. 
	Questions of 5 Marks each.
11.	Sides of a triangular field are 15 m, 16 m and 17 m. With the three corners of the field a cow, a buffalo and a horse are tied separately with ropes of length 7 m each to graze in the field. Find the area of the field which cannot be grazed by the three animals.
12.	An arc of a circle of radius 21 cm subtends an angle of 60^0 at the centre. Find: (i) the length of the arc. (ii) the area of the minor segment of the circle made by the corresponding chord.
	Case Study Based Questions (4 Marks)
13.	Interschool Rangoli competition was organized by one of the reputed schools of Odissa. The theme of the Rangoli competition was Diwali celebrations where students were supposed to make Mathematical designs. Students from various schools participated and made beautiful Rangoli designs. One such design is given below. 

	Rangoli is in the shape of square marked as ABCD, side of square being 40 cm. At each corner of a square, a quadrant of circle of radius 10 cm is drawn (in which diyas are kept). Also a circle of diameter 20 cm is drawn inside the square.	
	(i) What is the area of square ABCD ?	**1**
	(ii) Find the area of the circle.	**1**
	(iii) If the circle and the four quadrants are cut off from the square ABCD and removed, then find the area of remaining portion of square ABCD.	**2**
	OR	
	(iii) Find the combined area of 4 quadrants and the circle, removed.	**2**
14.	NSS (National Service Scheme) aims to connect the students to the community and to involve them in problem solving process. NSS symbol is based on the 'Rath' wheel of the Konark Sun Temple situatedin Odisha. The wheel signifies the progress cycle of life. The diagramatic representation of the symbol is given below:	
		
	Observe the figure given above. The diameters of inner circle are equally placed. Given that OP = 21 cm, OS = 10 cm.	
	Based on the above information, answer the following questions :	
	(i) Find m∠ROS.	1
	(ii) Find the perimeter of sector OPQ.	1
	(iii) (a) Find the area of shaded region PQRS.	2
	OR	
	(iii) (b) Find the area of shaded region ACB i.e. the segment ACB.	2

Answers

Answers	**1**	$\frac{16}{\pi}$	**2**	7m	**3**	44 cm	**4**	32 cm
	5	8.75 cm^2	**6**	285.5 cm^2	**7**	560	**8**	30.96 cm^2
	9	924 cm^2	**10**	91.38 cm^2	**11**	$(24\sqrt{21} - 77)cm^2$	**12**	22 cm, $= \left(231 - \frac{441\sqrt{3}}{4}\right) cm^2$ r (231 – 190.95) = 40.05 cm^2
	13	(i)1600 cm^2 (ii) $\frac{2200}{7}$ cm^2 or 314.28 cm^2 (iii)(a) $\frac{2200}{7}$ cm^2 or 314.28 cm^2 **OR** (b) $\frac{4400}{7}$ cm^2 or 628.57 cm^2						
	14	(i) 45° (ii) 58.5 cm (iii) (a) $\frac{3751}{28}$ cm^2 or 133.96 cm^2 OR $\frac{200}{7}$ cm^2 or 28.57 cm^2						