<table>
<tr><td rowspan="4"><img></td><td rowspan="4" align="center">INDIAN SCHOOL AL WADI AL KABIR</td></tr>
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	INDIAN SCHOOL AL WADI AL KABIR
	Class X, Mathematics
	Worksheet-Areas Related to Circles
	05 - 11-2023

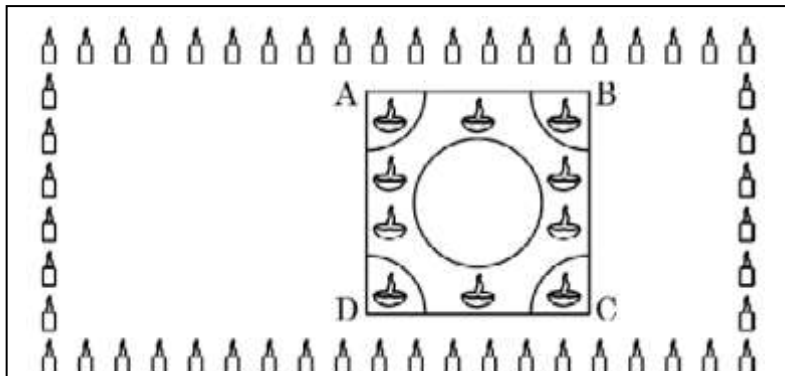| **Q. No.**	

<div align="center">Case Study Based</div>

I.	

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 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.

1.	What is the area of the square ABCD?	1m
2.	Find the area of the circle.	1m
3.	If the circle and 4 quadrants are cut off from square ABCD and removed, find the area of the remaining portion of square ABCD.	2m
4.	Find the combined area of the 4 quadrants and the circle, removed.	2m

| II	Flower beds look beautiful growing in gardens. One such circular park of radius r m, has two segments with flowers. One segment which subtends an angle of 90° at the centre is full of red roses, while the other segment with central angle 60° is full of yellow coloured flowers. [See figure]
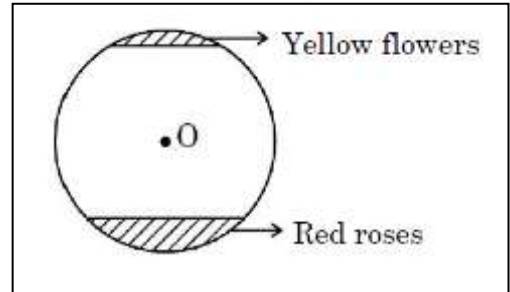
It is given that the combined area of the two segments (of flowers) is $256\frac{2}{3}$ sq m.

Based on the above information answer the following questions.

5.	Write an equation representing the total area of the two segments in terms of r .	1m
6.	Find the value of 'r'.	1m
7.	Find the area of the segment with red roses.	2m
8.	Find the area of the segment with yellow flowers.	2m

III	Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu. During the festival of Onam , your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition , suggests two designs given below. Observe these carefully.
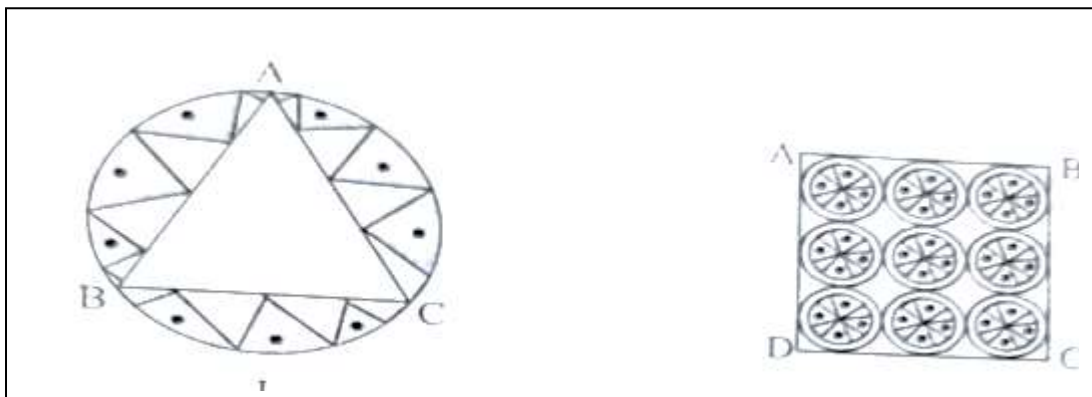
Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.
Design II: This Pookkalam is made with 9 circular design each of radius 7cm.

Based on the above information answer the following questions:

9.	Refer Design I: The side of equilateral triangle is:	1m
10.	Refer Design I: The altitude of the equilateral triangle is:	1m
11.	Refer Design II: Area of each circular design is:	2m
12.	Refer Design II: Area of the remaining portion of the square ABCD is:	2m

IV

In an annual day function of a school, the organizers wanted to give a cash prize along with a memento to their best students. Each memento is made as shown in the figure and its base ABCD is shown from the front side. The rate of silver plating is ₹20 per cm^2.
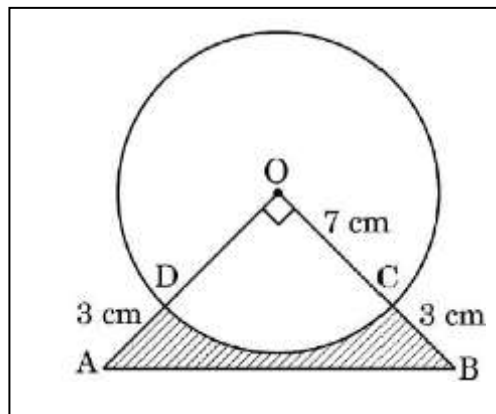

Based on the above information answer the following questions:(Take $\pi = 3.14$)

13.	What is the area of the quadrant ODCO?
14.	Find the area of ∆AOB.
15.	What is the total cost of silver plating the shaded part ABCD?
16.	What is the length of arc CD?

| V | A children's park is triangular in shape as shown in the figure below. In the middle of the park, there is a circular region for younger children to play. It is fenced with three layers of wire. The radius of the circular region is 3 m. |
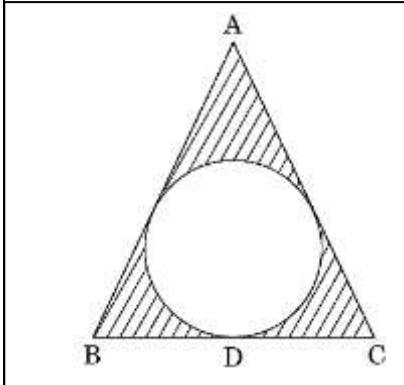
17.	The perimeter (or circumference) of the circular region in terms of π is:	1m
18.	The total length of wire used in terms of π is:	1m
19.	If BD = 6 m, DC = 9 m and ar (ABC) = 54 m^2, then the length of sides AB and AC, respectively, are:	2m
20.	The perimeter of ABC is:	2m

Answers

1	1600 cm²	2	314 cm²	3	972 cm²	4	628 cm²
5	$\frac{1}{4}\pi r^2 - \frac{1}{2}r^2 + \frac{1}{6}\pi r^2 - \frac{\sqrt{3}}{4}r^2 = 256\frac{2}{3}$						
6	26.1 m	7	194.63 sq m	8	62.03 sq m		
9	$32\sqrt{3}$ cm	10	48 cm	11	154 cm²	12	378 cm²
13	$\frac{77}{2}$ or 38.5	14	50 cm²	15	₹230	16	11 cm
17	6π m	18	18π m	19	9 m, 12 m	20	36 m