

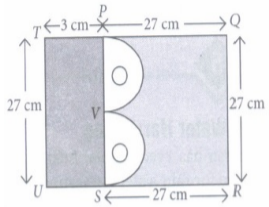
# QB365 QUESTION BANK SOFTWARE

## 10th Maths CBSE Important Case Study Questions for Areas Related To Circles 2024

### SECTION A

2 x 4 = 8

1) Mr Ramanand purchased a plot QRUT to build his house. He leave space of two congruent semicircles for gardening and a rectangular area of breadth 3 em for car parking.



Based on the above information, answer the following questions.

(i) Area of square PQRS is

**(a) 700 cm<sup>2</sup> (b) 729 cm<sup>2</sup> (c) 732 cm<sup>2</sup> (d) 735 cm<sup>2</sup>**

(ii) Area of rectangle left for car parking is

**(a) 64 cm<sup>2</sup> (b) 76 cm<sup>2</sup> (c) 81 cm<sup>2</sup> (d) 100 cm<sup>2</sup>**

(iii) Radius of semi-circle is

**(a) 6.75 cm (b) 7 cm (c) 7.75 cm (d) 8.75 cm**

(iv) Area of a semi-circle is

**(a) 61.59 cm<sup>2</sup> (b) 66.29 cm<sup>2</sup> (c) 70.36 cm<sup>2</sup> (d) 71.59 cm<sup>2</sup>**

(v) Find the area of the shaded region

**(a) 660.82 cm<sup>2</sup> (b) 666.82 cm<sup>2</sup> (c) 669.89 cm<sup>2</sup> (d) 700 cm<sup>2</sup>**

**Answer : (i) (b):** Side of square PQRS = 27 cm

$\therefore$  Area of square PQRS =  $27 \times 27 = 729 \text{ cm}^2$

**(ii) (c):** Area of rectangle left for car parking is area of region PSUT =  $27 \times 3 = 81 \text{ cm}^2$

**(iii) (a) :** Diameter of semi circle =  $PV = \frac{PS}{2} = \frac{27}{2}$   
= 13.5 cm

$\therefore$  Radius of semi circle =  $\frac{13.5}{2} = 6.75 \text{ cm}$

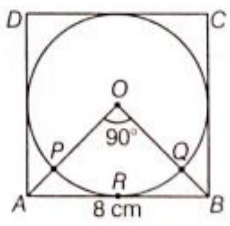
**(iv) (d):** Area of a semi -circle =  $\frac{1}{2}\pi r^2$   
=  $\frac{1}{2} \times \frac{22}{7} \times 6.75 \times 6.75 = 71.59 \text{ cm}^2$

**(v) (b):** Area of shaded region = area of rectangular plot QRUT - area of two semi-circles  
=  $30 \times 27 - 2 \times 71.59 = 666.82 \text{ cm}^2$

2) The inauguration of 'Earth day' week in a school, badges were given to volunteers. Organisers purchased these badges from an NCO, who made these badges in the form of a circle inscribed in a square of side 8 cm.



O is the centre of the circle and  $\angle AOB = 90^\circ$



Based on the above information, answer the following questions.

- (i) What is the area of square ABCD?
- (ii) What is the length of diagonal AC of square ABCD?
- (iii) Find the area of sector OPRQO.

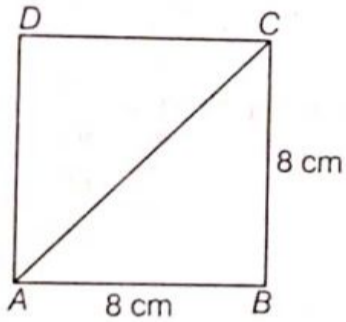
Or

- (iii) Find the area of remaining part of square ABCD when area of circle is excluded.

**Answer :** (i) Area of square ABCD = (side)<sup>2</sup> = 8<sup>2</sup> = 64 cm<sup>2</sup>

(ii) In  $\triangle ABC$ ,

$$AC^2 = AB^2 + BC^2 = 8^2 + 8^2$$



$$\Rightarrow AC^2 = 2 \times 8^2$$

$$\Rightarrow AC = 8\sqrt{2} \text{ cm}$$

(iii) Area of sector OPRQO of angle 90°

$$= \frac{90^\circ}{360^\circ} \times \pi \times (\text{radius})^2$$

$$= \frac{90^\circ}{360^\circ} \times \frac{22}{7} \times 4^2$$

[when a circle is inscribed in a square the diameter of the circle is equal to the side length of the square]

$$= \frac{22 \times 4}{7} = \frac{88}{7} \text{ cm}^2$$

$\therefore$  Area of remaining part = Area of square - Area of circle

$$= 64 - \pi \times (4)^2$$

$$= 64 - \frac{22}{7} \times 16$$

$$= 16 \left( 4 - \frac{22}{7} \right) = \frac{96}{7} \text{ cm}^2$$