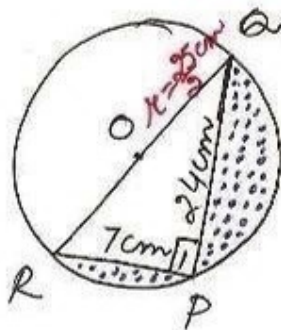


①



$\angle R = 90^\circ$ (angle in semi \odot)

In rt $\triangle RPA$

$$OR^2 = RP^2 + PO^2$$

[Pythagoras theorem]

$$= 7^2 + 24^2$$

$$= 49 + 576$$

$$= 625$$

$$\Rightarrow OR = \sqrt{625}$$

$$= 25 \text{ cm}$$

area of shaded region

= area of Semi \odot - ar ($\triangle RPA$)

$$= \frac{\pi R^2}{2} - \frac{1}{2} \times RP \times PA$$

$$= \frac{22 \times 25 \times 25}{7 \times 2 \times 2 \times 2} - \frac{1}{2} \times 7 \times 24$$

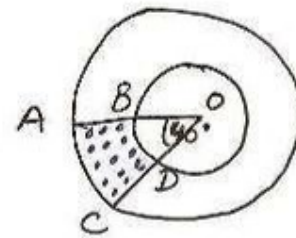
$$= \frac{6875}{28} - 84$$

$$= \frac{6875 - 2352}{28}$$

$$= \frac{4523}{28} \text{ cm}^2$$

$$= 161.54 \text{ cm}^2$$

②



$OB = r = 7 \text{ cm}$
 $OA = R = 14 \text{ cm}$
 $\theta = 40^\circ$

required area

= area of big. semi \odot
 - area of small. semi \odot

$$= \pi R^2 \frac{\theta}{360} - \pi r^2 \frac{\theta}{360}$$

$$= \pi \frac{\theta}{360} (R^2 - r^2)$$

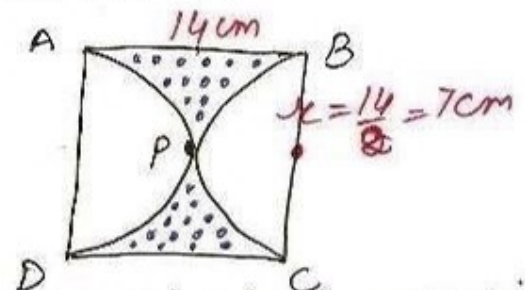
$$= \frac{22}{7} \times \frac{40}{360} (14^2 - 7^2)$$

$$= \frac{22}{7 \times 9} \times \pi \times 21 \left[\text{using } a^2 - b^2 = (a-b)(a+b) \right]$$

$$= \frac{154}{3}$$

$$= 51.33 \text{ cm}^2$$

③



area of shaded region

= area of square
 - area of 2 semi \odot s

$$= s^2 - 2 \times \frac{\pi r^2}{2}$$

$$= 14^2 - \frac{22}{7} \times 7 \times 7$$

$$= 196 - 154$$

$$= 42 \text{ cm}^2$$