

$$\begin{aligned}
 \text{ar}(\text{Segment I}) &= \text{ar}(\text{Minor Sector}) - \text{ar}(\triangle AOB) \\
 &= \frac{\pi r^2 \theta}{360} - \frac{1}{2} r^2 \\
 &= r^2 \left( \frac{\pi \theta}{360} - \frac{1}{2} \right) \\
 &= r^2 \left( \frac{\pi \times 90}{360} - \frac{1}{2} \right) \\
 &= r^2 \left( \frac{\pi}{4} - \frac{1}{2} \right) \text{ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{ar}(\text{Segment II}) &= \text{area}(\odot) - \text{ar}(\text{Seg I}) \\
 &= \pi r^2 - r^2 \left( \frac{\pi}{4} - \frac{1}{2} \right) \\
 &= \pi r^2 - \frac{\pi r^2}{4} + \frac{r^2}{2} \\
 &= r^2 \left( \pi - \frac{\pi}{4} + \frac{1}{2} \right) \\
 &= r^2 \left( \frac{3\pi}{4} + \frac{1}{2} \right) \text{ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Required difference} &= r^2 \left( \frac{3\pi}{4} + \frac{1}{2} \right) - r^2 \left( \frac{\pi}{4} - \frac{1}{2} \right) \\
 &= r^2 \left( \frac{3\pi}{4} - \frac{\pi}{4} + \frac{1}{2} + \frac{1}{2} \right) \\
 &= \left( \frac{5}{\sqrt{2}} \right)^2 \left[ \frac{2\pi}{4} + 1 \right] \\
 &= \frac{25}{2} \left( \frac{\pi}{2} + 1 \right) \\
 &= \left( \frac{25}{4} \pi + \frac{25}{2} \right) \text{ cm}^2
 \end{aligned}$$