

技術系専門試験問題演習講座

総合職 工学の基礎

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(数学)

(解1) 三角比の公式を使う。

余弦定理

$$CA^2 = 4^2 + 5^2 - 2 \cdot 4 \cdot 5 \cos \theta = 4^2 + 3^2 - 2 \cdot 4 \cdot 3 \cdot \cos(180^\circ - \theta)$$

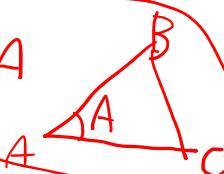
$\triangle ABC$ $\triangle ADC$

$$41 - 40 \cos \theta = 25 + 24 \cos \theta \quad \therefore \cos \theta = \frac{16}{64} = \frac{1}{4}$$

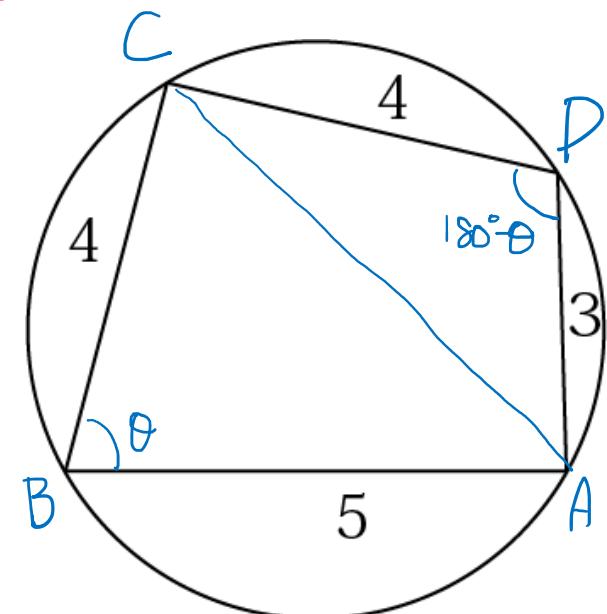
$$\sin \theta = \frac{\sqrt{15}}{4}$$

$$\begin{aligned} \text{面積} &= \triangle ABC + \triangle ADC \\ &= \frac{1}{2} \cdot 4 \cdot 5 \sin \theta + \frac{1}{2} \cdot 3 \cdot 4 \cdot \sin(180^\circ - \theta) \\ &= \frac{5\sqrt{15}}{2} + \frac{3\sqrt{15}}{2} = 4\sqrt{15} \end{aligned}$$

(公式)

$$\triangle ABC = \frac{1}{2} AB \cdot AC \cdot \sin A$$


$$4 / \sqrt{15}$$

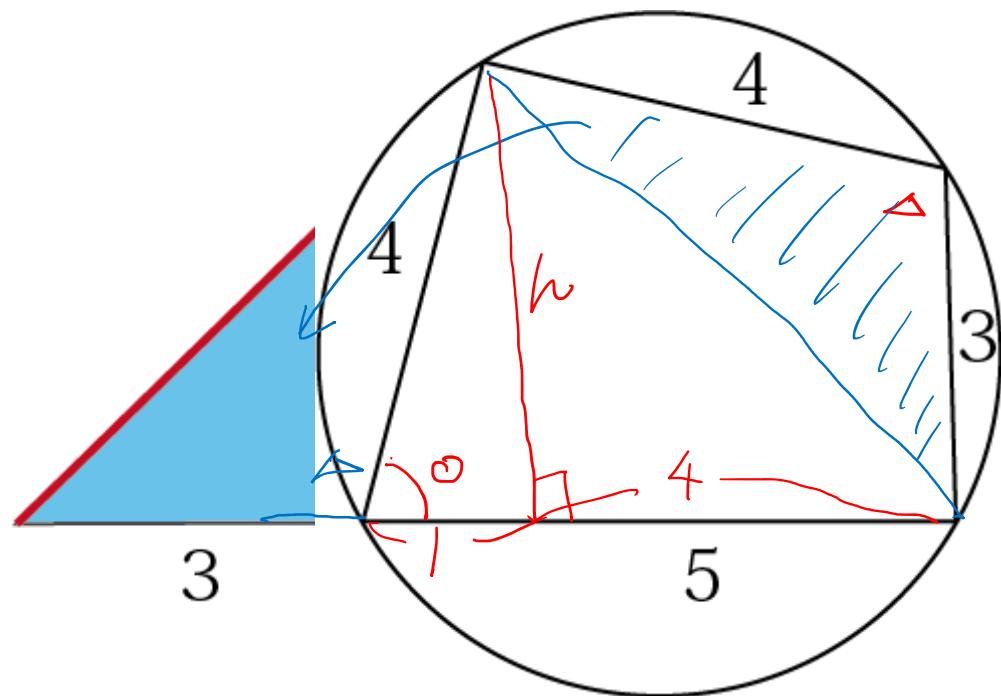


(解2) 図形比で解く

$$h = \sqrt{4^2 - 1^2} = \sqrt{15}$$

$$S = \frac{1}{2} \times 8 \times \sqrt{15} = 4\sqrt{15},$$

$$\theta + \Delta = 180^\circ$$



$$S = \frac{1}{2} \times (3+5) \times \sqrt{15} = 4\sqrt{15},$$

