

● 第 398 回<追加>問題解答<三角定規>

[追加問題 1]

$$\text{右図より } \frac{a}{2} = r \sin \frac{\pi}{5}, \quad \frac{b}{2} = r \sin \frac{\pi}{10} \quad \therefore a^2 - b^2 = 4r^2 \left(\sin^2 \frac{\pi}{5} - \sin^2 \frac{\pi}{10} \right)$$

$$\cos \frac{\pi}{5} = \frac{1 + \sqrt{5}}{4} \quad \text{より} \quad \sin^2 \frac{\pi}{5} = 1 - \cos^2 \frac{\pi}{5} = \frac{5 - \sqrt{5}}{8}$$

$$\text{また } \sin^2 \frac{\pi}{10} = \frac{1 - \cos \frac{\pi}{5}}{2} = \frac{3 - \sqrt{5}}{8}$$

$$\therefore a^2 - b^2 = 4r^2 \left(\frac{5 - \sqrt{5}}{8} - \frac{3 - \sqrt{5}}{8} \right) = r^2 = 2$$

$$\text{以上より } S = \pi r^2 = 2\pi \quad \dots[\text{答}]$$

