

المسألة الأولى

①

$$T = \frac{\pi}{|a|} \Rightarrow \frac{\pi}{p} \Rightarrow AC = \frac{\pi}{p}$$

$$\Rightarrow x = 0 \Rightarrow y = \tan\left(\frac{\pi}{p}\right) \Rightarrow B = 1$$

$$\Rightarrow \hat{ABC} = 1 \times \frac{\pi}{p} \times \frac{1}{p} = \frac{\pi}{p^2}$$

②

$$S = \sin \alpha \Rightarrow x_p = \sin \alpha - \frac{p}{p} \Rightarrow 4 \sin^2 \alpha - p \sin \alpha + p = 0$$

③

$$\Rightarrow \sin \alpha = \frac{p \pm 1}{1} \Rightarrow \cos \alpha = \frac{1}{p} \Rightarrow 1 + \frac{1}{p} = \frac{p}{1}$$

④

$$\frac{\sin \alpha}{-\cos \alpha} = 1^p \Rightarrow \tan \alpha = -1^p \Rightarrow \left. \begin{array}{l} \sin \alpha > 0 \\ -\cos \alpha > 0 \end{array} \right\} \Rightarrow \text{المثلث الثاني}$$

⑤

$$\Rightarrow \frac{p}{\sqrt{10}} - \left(-\frac{1}{\sqrt{10}}\right) = \frac{p}{\sqrt{10}} + \frac{1}{\sqrt{10}} = \frac{p+1}{\sqrt{10}}$$

⑥

$$\sin^2 \theta + \cos^2 \theta = \frac{p}{q} \Rightarrow (1 - \cos^2 \theta)^p + \cos^2 \theta = \frac{p}{q}$$

⑦

$$\Rightarrow 1 - \cos^2 \theta + \cos^2 \theta^p + \cos^2 \theta = \frac{p}{q} \Rightarrow \cos^2 \theta - \cos^2 \theta^p = -\frac{1}{q}$$

⑧

$$\Rightarrow \cos^2 \theta - (1 - \sin^2 \theta) = \cos^2 \theta + \sin^2 \theta = \frac{p}{q}$$

⑨

$$\frac{\sin x (1 + \cos x)}{1 + \sin^2 x} < 0 \Rightarrow \frac{1 + \cos x}{1 + \sin^2 x} < 0 \Rightarrow \sin x < 0 \Rightarrow \text{المثلث الثالث} \text{ (I)}$$

$$\frac{\sin^2 x - 1}{\cos x} > 0 \Rightarrow \frac{-\cos^2 x}{\cos x} > 0 \Rightarrow \cos x < 0 \Rightarrow \text{المثلث الثاني} \text{ (II)}$$

⑩

$$\text{(I) } \cap \text{ (II)} \Rightarrow \text{المثلث الثاني}$$

$$y \cos x = -y \sin x \rightarrow \tan x = -\frac{y}{y} \rightarrow \cot x = -\frac{y}{y}$$

$$\Rightarrow \tan x + \cot x = -\frac{y}{y} - \frac{y}{y} = \boxed{-\frac{2y}{y}} \quad \checkmark$$

$$\sqrt{1+\sin^2 \theta} = \sqrt{1+\cos^2 \theta} \xrightarrow{\text{فرم ساده}} \sqrt{1+\cos^2 \theta} = \sqrt{1+\cos^2 \theta} = \sqrt{1+\cos^2 \theta}$$

$$\sin \theta + \sin \theta = \sin(\theta + \theta) + \sin(\theta - \theta) =$$

$$\sin \theta \cos \theta + \sin \theta \cos \theta + \sin \theta \cos \theta - \sin \theta \cos \theta = 2\left(\frac{1}{2}\right) \cos \theta = \boxed{\cos \theta}$$

$$\frac{\sqrt{1+\sin^2 \theta}}{\cos \theta} = \boxed{\sqrt{2}}$$

$$\left(\frac{1 - \tan^2 \theta_0}{1 + \tan^2 \theta_0} \right) \left(\frac{1 - \tan^2 \theta_0}{1 + \tan^2 \theta_0} \right) = \cos^2 \theta_0 \times \cos^2 \theta_0 \times \cos^2 \theta_0$$

$$\Rightarrow \frac{\sin \theta_0 \cos^2 \theta_0 \cos^2 \theta_0 \cos^2 \theta_0}{\sin \theta_0} = \frac{1}{\cos \theta_0} \times \frac{\sin \theta_0 \times \cos^2 \theta_0}{\sin \theta_0} = \frac{1}{\cos \theta_0} \times \frac{\sin \theta_0}{\sin \theta_0} = \boxed{\frac{1}{\cos \theta_0}}$$

$$\sin \alpha + \cos \alpha = 2 \rightarrow \sin \alpha = 2 - \cos \alpha \xrightarrow{\text{توان}} \sin^2 \alpha = (2 - \cos \alpha)^2$$

$$1 - \cos^2 \alpha = 4 - 4\cos \alpha + \cos^2 \alpha \rightarrow 1 - \cos^2 \alpha - 4\cos \alpha + \cos^2 \alpha = 3 - 4\cos \alpha$$

$$1 - \frac{(1 + \cos^2 \alpha)}{2} - 4\cos \alpha + 3 \rightarrow 2 - \frac{1 + \cos^2 \alpha}{2} - 4\cos \alpha + 3$$

(ضریب 2)

$$2\cos^2 \alpha - 4\cos \alpha = \boxed{-2}$$

$$\cos^2 \frac{A}{2} = \frac{1 + \cos A}{2} \rightarrow \cos^2 B \sin C = 1 + \cos A \xrightarrow{A+B+C=\pi} A = \pi - (B+C)$$

$$1 + \cos(\pi - (B+C)) = 1 - \cos(B+C) = \cos^2 B \sin C$$

$$1 - \cos B \cos C + \sin B \sin C = \cos^2 B \sin C \rightarrow \sin B \sin C + \cos B \cos C = 1$$

$$\cos(B-C) = 1 \rightarrow B-C = 0 \quad \checkmark$$

$$B-C = 0 \rightarrow B=C \rightarrow A = \pi - 144^\circ = 36^\circ$$

$B+C = 144^\circ \quad (4 \times 36^\circ)$