

$$AC = \frac{2\pi}{T} \rightarrow T = \frac{2\pi}{f} = \frac{2\pi}{1}$$

$$B \Rightarrow x = \sigma \rightarrow B = \tan \frac{\pi}{4} = 1$$

$$S_{\text{معد}} = \frac{\text{ارتفاع} \times \text{عرض}}{2} = \frac{AC \times B}{2} = \frac{\frac{2\pi}{1} \times 1}{2} = \frac{\pi}{1}$$

✓

$$x^2 - \sin \alpha x - \frac{1}{4} \cos \alpha^2 = 0 \xrightarrow{x = \frac{1}{2}} \frac{1}{4} - \frac{1}{2} \sin \alpha - \frac{1}{4} (1 - \sin \alpha^2) = 0$$

$$\rightarrow \frac{1}{4} - \frac{1}{2} \sin \alpha - \frac{1}{4} + \frac{1}{4} \sin \alpha^2 = 0 \rightarrow \frac{1}{4} \sin \alpha^2 - \frac{1}{2} \sin \alpha + \frac{1}{4} = 0$$

$$\times 4 \rightarrow \sin \alpha^2 - 2 \sin \alpha + 1 = 0 \rightarrow \Delta = (-2)^2 - 4 \times 1 \times 1 = 0$$

$$\rightarrow \sin \alpha = \frac{2 \pm \sqrt{0}}{2} = \frac{2 \pm 0}{2} = 1 \rightarrow \sin \alpha = 1 \rightarrow \alpha = \frac{\pi}{2}$$

$$\sin \alpha^2 + \cos \alpha^2 = 1 \rightarrow \frac{1}{4} + \cos \alpha^2 = 1 \rightarrow \cos \alpha^2 = \frac{3}{4} \rightarrow \cos \alpha = \frac{\sqrt{3}}{2}$$

$$\log \sin \alpha - \log \cos \alpha = \log 3 \rightarrow \log \frac{\sin \alpha}{\cos \alpha} = \log 3 \rightarrow \frac{\sin \alpha}{\cos \alpha} = 3 \rightarrow \sin \alpha = 3 \cos \alpha$$

$$\sin \alpha^2 + \cos \alpha^2 = 1 \rightarrow (3 \cos \alpha)^2 + \cos \alpha^2 = 1 \rightarrow 10 \cos \alpha^2 = 1 \rightarrow \cos \alpha = \frac{1}{\sqrt{10}}$$

$$\rightarrow \cos \alpha = \frac{1}{\sqrt{10}} \rightarrow \sin \alpha = \frac{3}{\sqrt{10}} \rightarrow \sin \alpha - \cos \alpha = \frac{3}{\sqrt{10}} - \frac{1}{\sqrt{10}} = \frac{2}{\sqrt{10}} = \frac{\sqrt{10}}{5}$$

$$\sin \alpha - \cos \alpha = \frac{2}{\sqrt{10}} = \frac{\sqrt{10}}{5}$$

$$\sin \theta^2 + \cos \theta^2 = \frac{5}{6} \xrightarrow{\cos \theta^2 = 1 - \sin \theta^2} \sin \theta^2 - \sin \theta^2 + \frac{1}{6} = 0 \quad (1)$$

$$\sin \theta^2 + \cos \theta^2 = \frac{5}{6} \xrightarrow{\sin \theta^2 = 1 - \cos \theta^2} (1 - \cos \theta^2) + \cos \theta^2 = \frac{5}{6} \rightarrow 1 - \cos \theta^2 + \cos \theta^2 = \frac{5}{6} \rightarrow 1 = \frac{5}{6}$$

$$1 + \cos \theta^2 - 2 \cos \theta^2 + \cos \theta^2 = \frac{5}{6} \rightarrow \cos \theta^2 - \cos \theta^2 + \frac{1}{6} = 0 \quad (2)$$

$$(1) = (2) \rightarrow \sin \theta^2 - \sin \theta^2 = \cos \theta^2 - \cos \theta^2 \rightarrow \cos \theta^2 + \sin \theta^2 = \sin \theta^2 + \cos \theta^2 = \frac{5}{6}$$

$$\frac{\sin x^2}{\cos x} - \frac{1}{\cos x} > 0 \rightarrow \frac{\sin x^2 - 1}{\cos x} > 0 \rightarrow \cos x < 0 \quad (1)$$

$$\frac{\sin x(1 + \cos x)}{1 - 2 \cos x^2} < 0 \rightarrow \frac{\sin x(1 + \cos x)}{1 - 2 \cos x^2} < 0 \rightarrow \sin x < 0 \quad (2)$$

$$(1) \cap (2) \rightarrow \sin x < 0 \text{ و } \cos x < 0 \rightarrow x \in (\pi, \frac{3\pi}{2})$$

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$$\frac{p}{\sin x} + \frac{r}{\cos x} = 0 \rightarrow \frac{p \cos x + r \sin x}{\sin x \cos x} = 0 \rightarrow p \cos x + r \sin x = 0 \rightarrow p \cos x = -r \sin x$$

$$\tan x + \cot x = \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{\sin x}{-p \sin x} + \frac{-r \sin x}{\sin x} = -\frac{r}{p} - \frac{r}{p} = -\frac{r+q}{p}$$

$$= -\frac{1+r}{q}$$

$$1 + \sin \omega_0 = \sin \theta_0 + \sin \omega_0 = p \sin \left( \frac{\theta_0 + \omega_0}{p} \right) \times \cos \left( \frac{\theta_0 - \omega_0}{p} \right) = p \sin \theta_0 \times \cos \theta_0$$

$$\sin p + \sin q = p \sin \left( \frac{p+q}{p} \right) \times \cos \left( \frac{p-q}{p} \right)$$

$$\sin \omega_0 + \sin \theta_0 = p \sin \left( \frac{\omega_0 + \theta_0}{p} \right) \times \cos \left( \frac{\omega_0 - \theta_0}{p} \right) = p \sin \theta_0 \times \cos \theta_0 = \cos \theta_0$$

$$\frac{\sqrt{p \cos \theta_0}}{\cos \theta_0} = \frac{\sqrt{p} |\cos \theta_0|}{\cos \theta_0} \xrightarrow{\cos \theta_0 > 0} \frac{\sqrt{p} \cos \theta_0}{\cos \theta_0} = \sqrt{p}$$

$$1 - p \sin^2 \theta = 1 - \sin^2 \theta - \sin^2 \theta = \cos^2 \theta - \sin^2 \theta = \cos 2\theta$$

$$p \cos^2 \theta - 1 = \cos^2 \theta - 1 + \cos^2 \theta = -\sin^2 \theta + \cos^2 \theta = \cos 2\theta$$

$$\frac{1 - \tan^2 \theta}{1 + \tan^2 \theta} = \cos 2\theta$$

$$\cos \theta_0 \cos \theta_0 \cos \theta_0 \times \frac{\sin \theta_0}{\sin \theta_0} = \frac{\sin \theta_0 \cos \theta_0 \times \cos \theta_0 \times \cos \theta_0}{\sin \theta_0} = \frac{1}{\lambda} \frac{\cos \theta_0}{\sin \theta_0} = \frac{1}{\lambda} \cot \theta_0$$

$$\sin \alpha + p \cos \alpha = p \rightarrow \sin \alpha = p - p \cos \alpha \quad ; \quad \sin^2 \alpha + \cos^2 \alpha = 1$$

$$\rightarrow \cos^2 \alpha + (p - p \cos \alpha)^2 = 1 \rightarrow \cos^2 \alpha + p^2 + q^2 \cos^2 \alpha - 1 p \cos \alpha = 1$$

$$\rightarrow 1 \cos^2 \alpha - 1 p \cos \alpha = -p^2 \quad (1)$$

$$\cos^2 \alpha = \frac{1 + \cos 2\alpha}{2} \rightarrow \cos 2\alpha = p \cos^2 \alpha - 1 \xrightarrow{\times 2} \cos 2\alpha = 1 \cos^2 \alpha - 2$$

$$1 \cos^2 \alpha - 1 p \cos \alpha - 2 = -p^2 \quad \omega = -1 \quad \rightarrow -p^2 \omega = -1$$

$$\sin a \times \sin b = \frac{1}{2} (\cos(a-b) - \cos(a+b)) \rightarrow \sin B \sin C = \frac{1}{2} (\cos(B-C) - \cos(B+C))$$

$$\cos a \times \cos b = \frac{1}{2} (\cos(a+b) + \cos(a-b)) \rightarrow \cos A \times \cos A = \frac{1}{2} (\cos A + \cos A)$$

$$A+B+C=180^\circ \rightarrow B+C=180^\circ-A \xrightarrow{(1)} \frac{1}{2} (\cos(180^\circ - pC + A) - \cos(180^\circ - A)) = \frac{1}{2} (\cos pC + A + \cos A)$$

$$\frac{1}{2} \cos A + \frac{1}{2} = -\frac{1}{2} \cos pC + A + \frac{1}{2} \cos A \rightarrow -\frac{1}{2} \cos pC + A = \frac{1}{2} \rightarrow \cos pC + A = -1$$

$$\rightarrow pC + A = 180^\circ \rightarrow C = B = p \rightarrow A = 180^\circ - (p + p) = 180^\circ - 2p$$