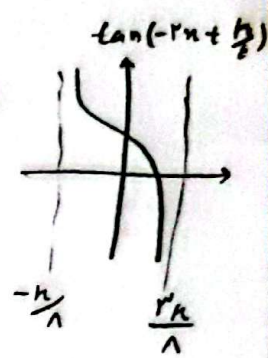


$$x \rightarrow x + \frac{\pi}{f}$$

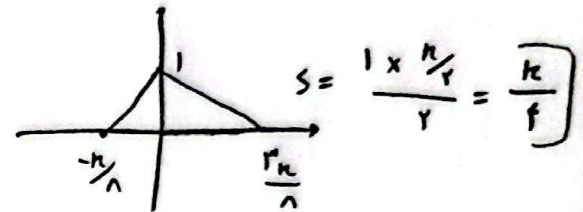


$$x \rightarrow -2x$$



$$\rightarrow A = -\frac{\pi}{4f}, \quad B = 1, \quad C = \frac{\pi}{4f}, \quad x = 0 \rightarrow \tan\left(\frac{\pi}{f}\right) = 1 \rightarrow B = 1$$

(۲) ✓



$$S = \frac{1 \times \frac{\pi}{f}}{\pi} = \frac{1}{f}$$

$$x = \frac{r}{f} \xrightarrow{\text{مربع درجه}} \frac{f}{9} - \frac{r}{f} \sin \alpha - \frac{1}{f} \cos^2 \alpha = 0 \xrightarrow{\times f^2} 14 - 2f \sin \alpha - 9 \cos^2 \alpha = 0 \rightarrow 14 - 2f \sin \alpha - 9(1 - \sin^2 \alpha) = 0$$

$$\rightarrow 9 \sin^2 \alpha - 2f \sin \alpha + 5 = 0 \xrightarrow{\text{روشن}} (\sin \alpha - \frac{1}{3})(\sin \alpha - \frac{5}{9}) = 0 \rightarrow \sin \alpha = \frac{1}{3} \quad (1)$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \xrightarrow{(1)} \cos^2 \alpha = \frac{8}{9} \quad (2)$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \xrightarrow{(2)} 1 + \tan^2 \alpha = \frac{9}{8} \quad (3) \quad (۲) \quad \checkmark$$

$$\log \frac{\sin \alpha}{-\cos \alpha} = \log 3 \rightarrow \frac{\sin \alpha}{-\cos \alpha} = 3 \rightarrow \sin \alpha = -3 \cos \alpha \quad (4)$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \xrightarrow{(4)} 9 \cos^2 \alpha + \cos^2 \alpha = 1 \rightarrow \cos \alpha = \pm \frac{\sqrt{10}}{10}, \quad \sin \alpha = \mp \frac{3\sqrt{10}}{10}$$

$$\sin \alpha - \cos \alpha = \pm \frac{3\sqrt{10}}{10} - \left(\pm \frac{\sqrt{10}}{10}\right) = \pm \frac{2\sqrt{10}}{10}$$

(۱, ۵)

$$\begin{aligned} \text{L.g } \sin \alpha &\rightarrow \sin \alpha > 0 \\ \text{L.g } -\cos \alpha &\rightarrow \cos \alpha < 0 \end{aligned} \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{نیمه دوم}$$

$$\sin^f \theta + \cos^r \theta = \frac{f}{\Delta}, \quad \cos^f \theta + \sin^r \theta = ?$$

$$\sin^f \alpha + \cos^r \alpha = \frac{f}{\Delta} \rightarrow \sin^f \alpha - \sin^r \alpha + 1 = \frac{f}{\Delta} \rightarrow \sin^f \alpha - \sin^r \alpha = \frac{-1}{\Delta} \quad (1), \quad \sin^r \alpha = \sin^f \alpha + \frac{1}{\Delta} \quad (2)$$

$$\cos^f \alpha + \sin^r \alpha = (1 - \sin^f \alpha)^r + \sin^f \alpha \xrightarrow{(2)} (1 - \sin^f \alpha)^r + \sin^f \alpha + \frac{1}{\Delta} = r \sin^f \alpha - r \sin^r \alpha + \frac{f}{\Delta}$$

$$\textcircled{1} \times r \rightarrow \frac{-r}{\Delta} + \frac{f}{\Delta} = \frac{f}{\Delta}$$

✓

$$\frac{r \sin \alpha + \sin \alpha \cdot \cos \alpha}{r - r \cos^f \alpha} < 0 \rightarrow \frac{\sin \alpha (r + \cos \alpha)}{r(1 - \cos^f \alpha)} < 0 \rightarrow \frac{\sin \alpha (r + \cos \alpha)}{r \sin^r \alpha} < 0$$

$$\rightarrow \frac{r + \cos \alpha}{r \sin \alpha} < 0 \xrightarrow{-1 \times \cos \alpha, r} \frac{r + \cos \alpha}{r \sin \alpha} < 0 \rightarrow \sin \alpha < 0 \quad \textcircled{1}$$

مقدار مثبت
باید منفی باشد

$$\sin \alpha \cdot \tan \alpha - \frac{1}{\cos \alpha} > 0 \rightarrow \frac{\sin^r \alpha - 1}{\cos \alpha} > 0 \xrightarrow{x-1} \frac{1 - \sin^r \alpha}{\cos \alpha} < 0 \rightarrow \frac{\cos^f \alpha}{\cos \alpha} < 0 \rightarrow \cos \alpha < 0 \quad \textcircled{2}$$

منفی

✓

$$\frac{r}{\sin \alpha} + \frac{r}{\cos \alpha} = 0, \quad \tan \alpha + \cot \alpha = ?$$

$$\frac{r \cos \alpha + r \sin \alpha}{\sin \alpha \cdot \cos \alpha} = 0 \xrightarrow{\sin \alpha \neq 0, \cos \alpha \neq 0} r \cos \alpha + r \sin \alpha = 0 \rightarrow r \cos \alpha = -r \sin \alpha \rightarrow \cos \alpha = \frac{-r}{r} \sin \alpha \quad (1)$$

$$\sin^f \alpha + \cos^r \alpha = 1 \rightarrow \sin^f \alpha + \frac{r}{f} \sin^r \alpha = 1 \rightarrow \frac{1}{f} \sin^r \alpha = 1 \rightarrow \sin^r \alpha = f \rightarrow \sin \alpha = \frac{r}{\sqrt{1r}}, \quad \cos \alpha = \frac{-r}{\sqrt{1r}}$$

$$\tan \alpha + \cot \alpha = \frac{1}{\sin \alpha \cdot \cos \alpha} = \frac{1}{\frac{r}{\sqrt{1r}} \times \frac{-r}{\sqrt{1r}}} = \frac{-1r}{f}$$

✓

$$\frac{\sqrt{1 + \sin \Delta^\circ}}{\sin \Delta^\circ + \sin 1^\circ} = ? \quad , \quad \sin(40 - 10) = \sin \Delta^\circ \rightarrow \frac{\sqrt{Y}}{Y} \cos 1^\circ - \frac{1}{Y} \sin 1^\circ = \sin \Delta^\circ \quad (1)$$

$$\frac{\sqrt{1 + Y \sin 2\Delta^\circ \cdot \cos 2\Delta^\circ}}{\sin \Delta^\circ + \sin 1^\circ} = \frac{\sin 2\Delta^\circ + \cos 2\Delta^\circ}{\sin \Delta^\circ + \sin 1^\circ} \stackrel{(1)}{=} \frac{\sin 2\Delta^\circ + \cos 2\Delta^\circ}{\frac{\sqrt{Y}}{Y} \cos 1^\circ - \frac{1}{Y} \sin 1^\circ + \frac{1}{Y} \sin 1^\circ} = \frac{\sin 2\Delta^\circ + \cos 2\Delta^\circ}{\frac{1}{Y} \sin 1^\circ + \frac{\sqrt{Y}}{Y} \cos 1^\circ}$$

$$\rightarrow \frac{\sin 2\Delta^\circ + \cos 2\Delta^\circ}{\sin 2^\circ - \sin 1^\circ + \cos 2^\circ - \cos 1^\circ} = \frac{\sin 2\Delta^\circ + \cos 2\Delta^\circ}{\cos(2^\circ - 1^\circ)} = \frac{\sqrt{Y} \sin(Y\Delta + 1\Delta)}{\cos 2^\circ} = \frac{\sqrt{Y} \sin V^\circ}{\cos(90 - V^\circ)}$$

$$= \frac{\sqrt{Y} \sin V^\circ}{\sin V^\circ} = \boxed{\sqrt{Y}} \quad (2) \quad \checkmark$$

$$(1 - Y \sin^2 \Delta^\circ) (Y \cos^2 10^\circ - 1) \left(\frac{1 - \tan^2 \gamma}{1 + \tan^2 \gamma} \right)$$

پراثر اول: $1 - Y \sin^2 \Delta^\circ = \cos 10^\circ$

پراثر دوم: $Y \cos^2 10^\circ - 1 = \cos 2^\circ$

پراثر سوم: $\frac{1 - \tan^2 \gamma}{1 + \tan^2 \gamma} = \frac{1 - \tan^2 \gamma}{\frac{1}{\cos^2 \gamma}} = \cos^2 \gamma \times \frac{\cos^2 \gamma - \sin^2 \gamma}{\cos^2 \gamma} = \cos 2\gamma$

ضرب در هم $\rightarrow \cos 1^\circ \times \cos 2^\circ \times \cos 2^\circ \times \sin 1^\circ \rightarrow \underbrace{\sin 1^\circ \times \cos 1^\circ}_{\frac{1}{2} \sin 2^\circ} \times \cos 2^\circ \times \cos 2^\circ = \frac{1}{2} \sin 2^\circ \times \cos 2^\circ$

$$= \frac{1}{2} \sin 4^\circ \xrightarrow{\div \sin 1^\circ} \frac{1}{2} \frac{\sin 4^\circ}{\sin 1^\circ}$$

$$= \frac{1}{2} \frac{\sin(40 - 10)}{\sin 10} = \boxed{\frac{1}{2} \cot 10^\circ} \quad (2) \quad \checkmark$$

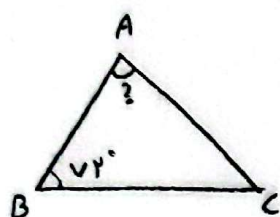
$$\sin \alpha + r \cos \alpha = r, \Delta \cos r \alpha - r \cos \alpha = ?$$

$$\sin \alpha = r - r \cos \alpha \quad (1)$$

$$\Delta (\cos^2 \alpha - \sin^2 \alpha) - r \cos \alpha = \Delta (r \cos^2 \alpha - 1) - r \cos \alpha = 1 \cos^2 \alpha - r \cos \alpha - \Delta = ?$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \xrightarrow{(1)} (r - r \cos \alpha)^2 + \cos^2 \alpha = 1 \rightarrow 1 \cos^2 \alpha - r \cos \alpha = -r \quad (2)$$

$$1 \cos^2 \alpha - r \cos \alpha - \Delta \xrightarrow{(2)} -r - \Delta = -1 \quad (3) \quad \checkmark$$



$$\sin \hat{B} \cdot \sin \hat{C} = \cos \frac{\hat{A}}{r}, \cos A = r \cos \frac{\hat{A}}{r} - 1 \rightarrow \cos \frac{\hat{A}}{r} = \frac{\cos A + 1}{r} \quad -10$$

$$\sin \hat{B} \cdot \sin \hat{C} = \frac{\cos A + 1}{r} \rightarrow r \sin \hat{B} \cdot \sin \hat{C} = \cos A + 1$$

$$\rightarrow r \sin \hat{B} \cdot \sin \hat{C} = \cos (180^\circ - (\hat{B} + \hat{C})) + 1 \rightarrow 1 - r \sin \hat{B} \cdot \sin \hat{C} = \cos (\hat{B} + \hat{C})$$

$$1 - r \sin \hat{B} \cdot \sin \hat{C} = \cos \hat{B} \cdot \cos \hat{C} - \sin \hat{B} \cdot \sin \hat{C} \rightarrow 1 - r \sin \hat{B} \cdot \sin \hat{C} + \sin \hat{B} \cdot \sin \hat{C} = \cos \hat{B} \cdot \cos \hat{C}$$

$$\rightarrow 1 - \sin \hat{B} \cdot \sin \hat{C} = \cos \hat{B} \cdot \cos \hat{C} \rightarrow \cos \hat{B} - \cos \hat{C} + \sin \hat{B} \cdot \sin \hat{C} = 1$$

$$\rightarrow \cos (\hat{B} - \hat{C}) = 1 \rightarrow \hat{B} - \hat{C} = 0 \rightarrow \hat{B} = \hat{C} \rightarrow \hat{B} = vr \rightarrow \hat{A} = 180^\circ$$

$$\hat{B} - \hat{C} = 180^\circ \rightarrow \hat{C} = vr$$

$$\rightarrow \hat{C} - \hat{B} = 180^\circ \rightarrow \hat{C} > 180^\circ$$

(3) ✓