

$$y = \tan\left(x - \frac{\pi}{4}\right)$$

طول AC برابر با دوره تناوب تابع است.

$$\rightarrow T = \frac{\pi}{|b|} = \frac{\pi}{1-1} = \frac{\pi}{1} = \pi = AC$$

B عمده ابتدا تابع است و به ازای $x=0$ بدست می آید

$$y = \tan\left(0 + \frac{\pi}{4}\right) = \tan \frac{\pi}{4} = 1$$

$$S_{ABC} = \frac{AC \times BO}{2} = \frac{\pi \times 1 \times \frac{1}{2}}{2} = \left[\frac{\pi}{4}\right] \checkmark$$

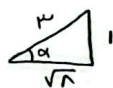
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$$9x^2 - (\sin \alpha)x - \frac{1}{9} \cos^2 \alpha = 0 \quad (\neq 0) \rightarrow \frac{x}{9} - \frac{1}{9} \sin \alpha - \frac{1}{9} \cos^2 \alpha = 0$$

$$\frac{1}{9} \sin^2 \alpha - \frac{1}{9} \sin \alpha + \frac{1}{9} \cos^2 \alpha = 0 \xrightarrow{\times 9} \sin^2 \alpha - \sin \alpha + \cos^2 \alpha = 0 \quad \begin{matrix} 1 - \sin^2 \alpha \\ \text{توکل دوسری} \end{matrix} \rightarrow \sin^2 \alpha - \sin \alpha + 1 - \sin^2 \alpha = 0$$

$$\sin \alpha = \frac{1}{9} = \frac{1}{9}$$

$$\sin \alpha = \frac{1}{9} = \frac{1}{9} \rightarrow \text{غیر ممکن}$$



$$\cos \alpha = \frac{\sqrt{80}}{9}$$

$$(\sin \alpha - 1)(\sin \alpha - 3) = 0$$

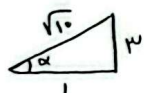
$$\text{پس داریم} \quad 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \rightarrow \left(\frac{\sqrt{80}}{9}\right)^2 = \frac{1}{9} = \frac{1}{9} \checkmark$$

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$$\log \sin \alpha - \log -\cos \alpha = \log 3$$

$$\log a - \log b = \log \frac{a}{b} \quad \text{پس داریم}$$

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



$$\sin \alpha = \frac{3}{\sqrt{10}}$$

$$\cos \alpha = \frac{-1}{\sqrt{10}}$$

با توجه به دامنه $\sin \alpha > 0$ و $\cos \alpha < 0$ پس

$$\sin \alpha - \cos \alpha = \frac{3}{\sqrt{10}} - \left(-\frac{1}{\sqrt{10}}\right) = \left[\frac{4}{\sqrt{10}}\right] \checkmark$$

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$$\sin^4 \theta + \cos^2 \theta = \frac{4}{5}$$

$$\cos^4 \theta - 2\cos^2 \theta + 1 + \cos \theta = \frac{4}{5}$$

$$\sin^2 \theta + \cos^2 \theta = 1 \quad \text{پس داریم}$$

$$(\sin^2 \theta)^2 + \cos^2 \theta = \frac{4}{5}$$

$$\cos^4 \theta = \cos^2 \theta - \frac{1}{5}$$

$$(1 - \cos^2 \theta)^2 + \cos^2 \theta = \frac{4}{5}$$

$$\rightarrow \frac{\cos^4 \theta + \sin^2 \theta}{\cos^2 \theta - \frac{1}{5}} \rightarrow \frac{\cos^2 \theta + \sin^2 \theta - \frac{1}{5}}{1} = 1 - \frac{1}{5} = \left[\frac{4}{5}\right] \checkmark$$

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$$\frac{3 \sin \alpha + \sin \alpha \cos \alpha}{2(1 - \cos^2 \alpha)} = \frac{\sin \alpha (3 + \cos \alpha)}{2 \sin^2 \alpha} = \frac{3 + \cos \alpha}{2 \sin \alpha} < 0$$

$$-1 < \cos \alpha < 1$$

$$2 < \cos \alpha + 3 < 4$$

$$\sin \alpha \frac{\sin \alpha}{\cos \alpha} - \frac{1}{\cos \alpha} = \frac{\sin^2 \alpha - 1}{\cos \alpha} > 0 \rightarrow \frac{-\cos^2 \alpha}{\cos \alpha} > 0 \rightarrow -\cos \alpha > 0 \rightarrow \cos \alpha < 0$$

$$\cos \alpha < 0$$

① در ناحیه سوم قرار دارد
②

① همواره
②

③

④

⑤

⑥

$$\frac{r}{\sin \alpha} = -\frac{r}{\cos \alpha} \frac{\sin \alpha \pm 0}{\cos \alpha \pm 0} \rightarrow r \cos \alpha = -r \sin \alpha \xrightarrow{\div \cos \alpha} r = -r \tan \alpha \rightarrow \tan \alpha = -\frac{r}{r}$$

$$\xrightarrow{\div \sin \alpha} r \cot \alpha = -r \rightarrow \cot \alpha = -\frac{r}{r}$$

$$\tan \alpha + \cot \alpha = -\frac{r}{r} + -\frac{r}{r} = -\frac{r-r}{r} = -\frac{1-r}{r}$$

$$y = \frac{\sqrt{1 + \sin \omega_0}}{\sin \omega_0 + \sin l_0}$$

$$\sin \omega_0 + \sin l_0 = \boxed{r \sin \varphi_0 \cos \varphi_0} = \cos \varphi_0 \quad \frac{\sqrt{(\sin \varphi_0 + \cos \varphi_0)^2}}{\cos \varphi_0} = \frac{\sin \varphi_0 + \cos \varphi_0}{\cos \varphi_0}$$

$$\alpha = \frac{\omega_0 + l_0}{r} \quad B = \frac{\omega_0 - l_0}{r}$$

$$= \frac{\sqrt{r} \sin(\varphi_0 + \varphi_0)}{\cos \varphi_0} = \frac{\sqrt{r} \sin \varphi_0}{\cos \varphi_0} = \frac{\sqrt{r} \cos \varphi_0}{\cos \varphi_0} = \boxed{\sqrt{r}}$$

$$\frac{x \sin l_0}{\sin l_0} \left(\frac{1 - r \sin^2 \varphi_0}{\cos l_0} \right) \left(\frac{r \cos^2 l_0 - 1}{\cos \varphi_0} \right) \left(\frac{1 - \tan^2 \varphi_0}{1 + \tan^2 \varphi_0} \right) \quad \boxed{\sin l_0 = \cos l_0} \quad \sin \alpha = \frac{1 - \cos \alpha}{r}$$

$$\cos^2 \alpha = \frac{1 + \cos \alpha}{r}$$

$$\rightarrow \frac{\sin l_0 \cos l_0 \cos \varphi_0 \cos \varphi_0}{\frac{1}{r} \sin \varphi_0 \frac{1}{r} \sin \varphi_0 \frac{1}{r} \sin \varphi_0} \times \frac{1}{\sin l_0} = \frac{1}{r} \frac{\sin l_0}{\sin l_0} = \boxed{\frac{1}{r} \cot l_0} \quad \cos \alpha = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha}$$

$$\sin \alpha + r \cos \alpha = r \rightarrow x + ry = r$$

$$\sin \alpha = x \quad \boxed{m = r - ry}$$

$$\cos \alpha = y \quad \sin^2 \alpha + \cos^2 \alpha = 1 \rightarrow x^2 + y^2 = 1 \quad \textcircled{1}$$

$$\textcircled{1} \rightarrow (r - ry)^2 + y^2 = 1 \rightarrow ry^2 - 1ry + r + y^2 = 1$$

$$\log^2 - 1ry + r = 0 \rightarrow \log^2 - 1ry = -r$$

$$\omega \cos \varphi_0 - 1r \cos \alpha = \omega(r \cos^2 \alpha - 1) - 1r \cos \alpha = \omega(r y^2 - 1) - 1r y = \log^2 - 1ry - \omega = -\omega - r = \boxed{-r}$$

$$\hat{A} + \hat{B} + \hat{C} = 180^\circ \rightarrow \hat{A} + \hat{C} = 180^\circ \quad \hat{C} = 180^\circ - \hat{A}$$

$$\sin B \cdot \sin C = \cos^2 \frac{\hat{A}}{r}$$

$$\sin \varphi_0 \cdot \sin(180^\circ - \hat{A}) = \cos^2 \frac{\hat{A}}{r} \Rightarrow \sin \varphi_0 \times \sin\left(\frac{\pi}{r} + 180^\circ - A\right) = \sin \varphi_0 \times \cos(180^\circ - A) = \cos \frac{\hat{A}}{r}$$

$$\cos(\alpha + y) + \cos(\alpha - y) = r \cos \alpha \cos y \rightarrow \cos(A) + \cos(A - \varphi_0) = r \cos \frac{\hat{A}}{r}$$

$$\cancel{\cos A} + \cos(A - \varphi_0) = 1 + \cancel{\cos A}$$

$$\cos(A - \varphi_0) = 1 \rightarrow A - \varphi_0 = 0 \rightarrow A = \varphi_0$$