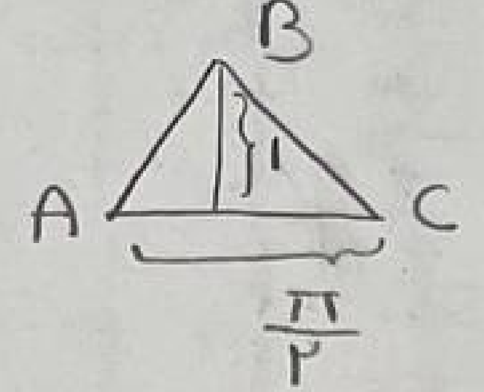
کیمیا یحیی آبادی

1

$y = \tan\left(-2x + \frac{\pi}{4}\right)$ ۱ دوره تناوب = فاصله ی CA

$x = 0$ دوره تناوب تانژانت $\frac{\pi}{|-2|} = \frac{\pi}{2}$

$\tan\left(\frac{\pi}{4}\right) = 1 = y_B$



$\frac{1 \times \frac{\pi}{2}}{2} = \frac{\pi}{4} = S_{ABC}$

2

$x^2 - (\sin a)x - \frac{1}{4}\cos^2 a = 0 \xrightarrow{x = \frac{2}{3}} \frac{4}{9} - \frac{2}{3}\sin a - \frac{1}{4}\underbrace{\cancel{\cos^2 a}}_{1 - \sin^2 a} = 0$

$\rightarrow \frac{1}{4}\sin^2 a - \frac{2}{3}\sin a + \underbrace{\frac{4}{9} - \frac{1}{4}}_{\frac{7}{36}} = 0 \rightarrow 9\sin^2 a - 24\sin a + 7$

$3 \times (8)$

$(3\sin a - 1)(3\sin a - 7) = 0$

$\checkmark \frac{1}{3}$ غ ق ق $\frac{7}{3}$

$1 + \tan^2 a = \frac{1}{\underbrace{\cancel{\cos^2 a}}_{1 - \sin^2 a = \frac{8}{9}}} = \frac{9}{8}$

3

$\log(\overset{+}{\sin a}) - \log(-\overset{\text{منفی}}{\cos a}) = \log 3 \rightarrow \log \frac{\sin a}{-\cos a} = \log 3$

$\rightarrow \frac{\sin a}{\cancel{-}\cos a} = -3 \quad -3\cos a = \sin a \rightarrow \cos^2 a + \underbrace{\cancel{\sin^2 a}}_{9\cos^2 a} = 1 \rightarrow \cancel{10}\cos^2 a = 1 \rightarrow \cos a = -\frac{1}{\sqrt{10}}$, $\sin a = \frac{3}{\sqrt{10}}$

$\underbrace{\cancel{\sin a}}_{\frac{3}{\sqrt{10}}} - \underbrace{\cancel{\cos a}}_{-\frac{1}{\sqrt{10}}} = \frac{4}{\sqrt{10}}$

4

$\sin^4\theta + \underbrace{\cancel{\cos^2\theta}}_{1 - \sin^2\theta} = \frac{4}{5}$

$\underbrace{\cos^4\theta}_{1-\cos^2\theta} + \sin^2\theta = \sin^4\theta - 2\sin^2\theta + 1 + \sin^2\theta$

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

$$\frac{3\sin x+\sin x\cos x}{2-2\cos^2 x}<0 \to \frac{\sin x(3+\cos x)}{2\sin^2 x}<0 \to \sin x<0$$

همواره +

$2-2\cos^2x = 2(1-\cos^2x)$, $\quad 1-\cos^2x=\sin^2 x$

ربع سوم

$$\sin x\tan x-\frac{1}{\cos x}>0 \to \frac{\sin^2 x-1}{\cos x}>0 \to \cos x<0$$

$\sin x\tan x = \frac{\sin^2 x}{\cos x}$, $\quad \sin^2x-1=-\cos^2 x$

$$\frac{2}{\sin x}+\frac{3}{\cos x}=0 \xrightarrow{\times \sin x\cos x} 2\cos x+3\sin x=0 \to 3\sin x=-2\cos x \to \sin x=-\frac{2}{3}\cos x$$

$$\frac{4}{9}\cos^2x+\cos^2x=1$$

$$\frac{13}{9}\cos^2x=1 \to \cos^2 x=\frac{9}{13}$$

$$\sin x=\frac{2}{\sqrt{13}} \qquad \cos x=\frac{3}{\sqrt{13}}$$

علامت‌ها متفاوت

$$\tan x+\cot x=\frac{1}{\sin x\cos x}=\frac{1}{\frac{6}{13}}=\frac{13}{6}$$

$$\frac{\sqrt{1+\sin 50^\circ}}{\sin 50^\circ+\sin 10^\circ}$$

$\sin 50^\circ=\cos 40^\circ$, $\quad 1+\cos 40^\circ=2\cos^2 20^\circ \to \sqrt{2}\cos 20^\circ$

$\cos 40^\circ$: $40-20$; $\sin 10^\circ$: $30-20$

$\to \sin 30^\circ\cos 20^\circ-\cos 30^\circ\sin 20^\circ$, $\quad \sin 30^\circ=\frac{1}{2}$, $\cos 30^\circ=\frac{\sqrt{3}}{2}$

$\to \cos 40^\circ\cos 20^\circ+\sin 40^\circ\sin 20^\circ$, $\quad \cos 40^\circ=\frac{1}{2}$, $\sin 40^\circ=\frac{\sqrt{3}}{2}$

$$\frac{\sqrt{2}\cos 20^\circ}{\cos 20^\circ}=\sqrt{2}$$

$$(1-2\sin^2 50^\circ)(2\cos^2 10^\circ-1)\left(\frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ}\right)$$

طلایی $\cos 10^\circ$ $\qquad \cos 20^\circ \qquad 1+\tan^2 20^\circ=\frac{1}{\cos^2 20^\circ}$, $\quad \frac{\cos^2 20^\circ-\sin^2 20^\circ}{\cos^2 20^\circ}$

$$\frac{\times\sin 10^\circ}{\sin 10^\circ}\cos 10^\circ\cos 20^\circ\cos 40^\circ$$

$$\frac{1}{2}\sin 20^\circ \qquad \frac{1}{4}\sin 40^\circ \qquad \frac{1}{8}\frac{\sin 80^\circ}{\sin 10^\circ}=\frac{1}{8}\cot 10^\circ$$

$\sin 80^\circ = \cos 10^\circ$

$$\sin a + 3\cos a = 2 \rightarrow \sin a = 2 - 3\cos a \rightarrow \cos^2 a + 4 + 9\cos^2 a - 12\cos a = 1$$

$$\rightarrow 10\cos^2 a - 12\cos a + 3 = 0$$

$$5(2\cos^2 a) \rightarrow \underbrace{5\cos 2a - 12\cos a}_{(-8)} + 8 = 0$$

$$1 + \cos 2a$$

$$\sin B \cancel{\sin C} = \cos^2 \frac{A}{2} \qquad C = 180 - (A+B)$$

$$\sin(A+B) \qquad \frac{1+\cos A}{2} \qquad \sin C = \sin(A+B)$$

$$\sin^2 B \cos A - \frac{\cos A}{2}$$

$$\sin B(\sin A\cos B + \cos A \sin B) = \frac{1+\cos A}{2}$$

$$\cos A\left(\sin^2 B - \frac{1}{2}\right)$$

$$-\frac{\cos 2B}{2}$$

$$\rightarrow \underbrace{\frac{\sin 2B}{\cancel{2}}\sin A - \frac{\cos^2 B}{\cancel{2}}\cos A}_{} = \frac{1}{\cancel{2}}$$

$$-\cos(A+2B) = 1 \rightarrow \cos(A+2B) = -1$$

$$A + 2B = 180 \rightarrow 180 - 2B = 36 = A$$

$$72$$

$$144$$