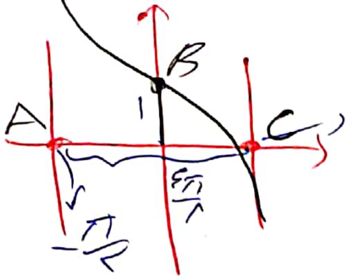

$S_{\hat{ABC}} = ?$ $\frac{\pi}{4}$

$y=\tan(-2x+\frac{\pi}{4})$ ①

$x=0 \to \tan(\frac{\pi}{4})=1 \to B(0,1)$

$-2x+\frac{\pi}{4}=\frac{\pi}{2} \to x=-\frac{\pi}{8} \to A(-\frac{\pi}{8},0)$

$-2x+\frac{\pi}{4}=-\frac{\pi}{2} \to x=\frac{3\pi}{8} \to C(\frac{3\pi}{8},0)$

$1\times\frac{4\pi}{8}\times\frac{1}{2}=\frac{4\pi}{16}=\frac{\pi}{4}$

برای جانشینی B دوازدهم بیمه

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② $x^2-(\sin\alpha)x-\frac{1}{4}\cos^2\alpha=0 \xrightarrow{\text{یکی از ریشه ها}} \frac{4}{3}$ $1+\tan^2\alpha=?$

$x=\frac{4}{3} \longrightarrow \frac{16-24\sin\alpha-9\cos^2\alpha}{36} \Rightarrow \frac{9\sin^2-24\sin\alpha+7}{36}=0$

$\frac{9}{8}$

$9\sin^2-24\sin+7=0 \longrightarrow (3\sin-1)(3\sin-7) \Rightarrow \sin\alpha=\cancel{\frac{7}{3}}, \frac{1}{3}$ $-1\le\sin\le1$

$\sin=\frac{1}{3} \longrightarrow \cos=\frac{\sqrt{8}}{3} \longrightarrow \frac{\sin}{\cos}=\frac{\frac{1}{3}}{\frac{\sqrt{8}}{3}}=\frac{1}{\sqrt{8}}$ $1+(\frac{1}{\sqrt{8}})^2=1+\frac{1}{8}=\frac{9}{8}$

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③ $\log(\sin\alpha)-\log(-\cos\alpha)=\log 3 \longrightarrow \log_b^a \to a>0 \longrightarrow \sin\alpha>0$, $\cos\alpha<0$

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

$\sin\alpha=\frac{3}{\sqrt{10}}$ $\cos\alpha=\frac{1}{\sqrt{10}}$ $\sin-\cos=\frac{3}{\sqrt{10}}-\frac{-1}{\sqrt{10}}=\frac{4}{\sqrt{10}}$

$\frac{4}{\sqrt{10}}\times\frac{\sqrt{10}}{\sqrt{10}}=\frac{4\sqrt{10}}{10}=\frac{2\sqrt{10}}{5}$ $\frac{2\sqrt{10}}{5}$

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

$(\sin^2)^2$

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

$\frac{4}{5}$

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

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⑤ $\frac{3\sin x+\sin x\cos^2 x}{2-2\cos^2 x}<0$ $\underbrace{\sin x\tan x}_{\frac{\sin^2 x}{\cos x}}-\frac{1}{\cos x}>0$ $\cos\to -$ $\sin\to -$

ناحیه ۳

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

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

6

$$\frac{2}{\sin x}+\frac{3}{\cos x}=0 \qquad \tan x+\cot x=?$$

$$\frac{2}{\sin}+\frac{3}{\cos}=\frac{2\cos+3\sin}{\sin\cos}=0 \longrightarrow \frac{3\sin}{\sin\cos}=\frac{-2\cos}{\sin\cos}\longrightarrow \sin=-\frac{2}{3}\cos$$

$$\tan=-\frac{2}{3}\longrightarrow \cot=-\frac{3}{2} \qquad -\frac{2}{3}+-\frac{3}{2}\longrightarrow\frac{-4-9}{6}=\frac{-13}{6}$$

$$\frac{-13}{6}$$

7

$$\frac{\sqrt{1+\sin 50\cdot\cos 40}}{\underset{30+20}{\sin 50}+\underset{30-20}{\sin 10}} \quad \cos^2 20-\sin^2 20+\cos^2 \quad =\frac{\sqrt{2\cos^2 20}}{2\sin 30\cos 20}=\frac{\sqrt{2}\cos 20}{\cancel{2}\sin 30\,\cancel{\cos 20}}$$

$$\frac{1}{\sqrt{2}\sin 30}=\frac{1}{\sqrt{2}\times\frac{1}{2}}=\frac{2}{\sqrt{2}}=\sqrt{2}$$

$$\sqrt{2}$$

8

$$\underbrace{(1-2\sin^2 5)}_{\cos 10}\underbrace{(2\cos^2 10-1)}_{\cos 20}\underbrace{\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)}_{\cos 40}\times\frac{\sin 10}{\sin 10}$$

$$\frac{1}{8}\,\frac{\sin 80}{\sin 10}=\frac{\cot 10}{8}=\frac{\tan 80}{8}$$

$$\frac{\cot 10^\circ}{8}=\frac{\tan 80^\circ}{8}$$

9

$$\sin\alpha+3\cos\alpha=2 \qquad 5\cos 2\alpha-12\cos\alpha=?$$

$$\sin=2-3\cos\alpha \qquad \cos^2\alpha-\sin^2\alpha=2\cos^2\alpha-1$$

$$\underset{1-\cos^2}{\sin^2}=4+9\cos^2-12\cos \qquad 5(2\cos^2\alpha-1)-12\cos\alpha=\underbrace{10\cos^2\alpha-12\cos\alpha}_{-3}-5=-8$$

$$10\cos^2-12\cos+3=0\longrightarrow 10\cos^2-12\cos\alpha=-3$$

$$-8$$

10

$$\sin B\sin C=\cos^2\frac{A}{2} \qquad \hat{B}=72^\circ \qquad \hat{A}=? \qquad A=180-B-C$$

$$\frac{1+\cos A}{2}\longrightarrow 2\sin B\sin C=1+\cos A \qquad \hat{A}=36^\circ$$

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

$$+\sin B\sin C\Longrightarrow \sin B\sin C+\cos B\cos C\le 1=\cos B\cos C+\sin B\sin C$$

$$=\cos(B-C)\le 1=\cos(0)\longrightarrow B-C=0\longrightarrow C=B=72$$

$$A=180-2(72)=36$$

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