(سارا امین‌زاد)

$-2x+\frac{\pi}{4}=0 \longrightarrow x=\frac{\pi}{8} \longrightarrow S=\frac{1}{2}\times\frac{\pi}{4}\times 1=\frac{\pi}{8}$ ①

$A(0,0),\ C(\frac{\pi}{4},0),\ B(0,1)$

$x_1+x_2=\sin\alpha=S$

$x_1x_2=-\frac{1}{4}\cos^2\alpha=P \longrightarrow x_2=-\frac{1}{4}\cos^2\alpha\div\frac{2}{3}=-\frac{3}{8}\cos^2\alpha$ ②

$\frac{2}{3}-\frac{3}{8}\cos^2\alpha=\sin\alpha$ طبق $\sin^2\alpha+\cos^2\alpha=1 \rightarrow 16-9\cos^2\alpha=24\sin\alpha$

$1+\tan^2\alpha=\frac{1}{\cos^2\alpha} \Rightarrow \frac{25}{9}$

$\log\frac{\sin\alpha}{-\cos\alpha}=\log 3 \rightarrow \frac{\sin\alpha}{-\cos\alpha}=3 \Rightarrow -\tan\alpha=3 \rightarrow \tan\alpha=-3 \searrow \begin{matrix}\cos\alpha=m\\ \sin=-3m\end{matrix}$ ③

$\sin^2\alpha+\cos^2\alpha=1 \rightarrow 9m^2+m^2=1 \rightarrow m^2=\frac{1}{10}$

$\sin\alpha-\cos\alpha=-3m-m=-4m \rightarrow -4\times\frac{1}{\sqrt{10}}=-\frac{2\sqrt{10}}{5}$

$\sin^4\theta+\cos^4\theta=\frac{4}{5} \rightarrow x^2+1-x=\frac{4}{5} \rightarrow x^2-x+\frac{1}{5}=0 \Rightarrow x=\frac{1\pm\sqrt{\frac{1}{5}}}{2}$ ④

$\nearrow x^2-x=-\frac{1}{5}$

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

طلب $\rightarrow \cos^4\theta+\sin^2\theta \rightarrow (1-x)^2+x=1-x+x^2 \Rightarrow 1-\frac{1}{5}=\frac{4}{5}$

$2-2\cos^2x=2(1-\cos^2x)=2\sin^2x$ ⑤

$\frac{\sin x(3+\cos x)}{2\sin^2x}<0 \rightarrow \sin x<0$ $\quad \sin x(\frac{\sin x}{\cos x})-\frac{1}{\cos x}>0 \rightarrow \frac{\sin^2x-1}{\cos x}>0$ $\quad -\cos x<0$

$\cos x<0$ ربع سوم

$2\cos x+3\sin x=0 \rightarrow 3\sin x=-2\cos x \rightarrow \tan x=\frac{\sin x}{\cos x}=-\frac{2}{3}$ ⑥

$\tan x+\cot x \rightarrow \tan x+\frac{1}{\tan x}=-\frac{2}{3}-\frac{3}{2}=-\frac{13}{6}$

⑦

$\sqrt{1+\sin 50} \rightarrow \sqrt{\sin 50+\sin 90}$

(سارا امینی راد)

8

$1 - 2\sin^2\alpha = \cos 10$

$2\cos^2 10 - 1 = \cos 20$

$\tan\theta = t \qquad \frac{1-t^2}{1+t^2} = \cos 20 \rightarrow \frac{1-\tan^2 20}{1+\tan^2 20} = \cos 40$

$\frac{\times \sin 10}{\sin 10}(\cos 10 \ \cos 20 \ \cos 40) \rightarrow \frac{1}{2}\sin 20 \times \cos 20 \rightarrow \frac{1}{4}\sin 40 \times \cos 40 \rightarrow \frac{\frac{1}{8}\sin 80}{\sin 10}$

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

9

$\sin\alpha = s \qquad \cos\alpha = c$

$s + 3c = 2 \rightarrow s = 2 - 3c$

$s^2 + c^2 = 1$

$(2-3c)^2 + c^2 = 1 \rightarrow 10c^2 - 12c + 3 = 0$

$\cos 2\alpha = 2c^2 - 1 \rightarrow 5(2c^2-1) - 12c = 10c^2 - 5 - 12c$

$10c^2 - 12c + 3 = 0 \rightarrow \underbrace{10c^2 - 12c} - 5 = -3 - 5 = -8$

10

$A + B + C = 180 \rightarrow C = 180 - (A + 72)$

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

$\sin 72 \sin(180 - (A+72)) = \cos^2\frac{A}{2} \longrightarrow \sin 72 \times \sin(A+72) = \cos^2\frac{A}{2} \longrightarrow A \approx 30$