Year: Month: Day: 1/1 Subject:

یازدهم تی سلسله A — پرنیا دیباجی

$$\frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \quad (1)$$

اگر $\cos\alpha<0$

$$\frac{-1-\sin\alpha}{\cos\alpha} = \begin{cases} \cancel{\dfrac{1-\sin\alpha}{\cos\alpha}} \\ \dfrac{-1+\sin\alpha}{\cos\alpha} \end{cases}$$

$$\Rightarrow \frac{1-\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \boxed{\cos\alpha>0} \quad (\mathrm{I})$$

$$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \longrightarrow \frac{\cos\alpha}{\sqrt{\sin^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \boxed{\sin\alpha>0} \quad (\mathrm{II})$$

I و II $\Rightarrow$ ناحیه اول

$$\sin 2x = \frac{m-1}{4} \qquad \frac{-\pi}{12} < x < \frac{5\pi}{12} \xrightarrow{\times 2} \frac{-\pi}{6} < 2x < \frac{5\pi}{6} \quad (2)$$

$$\Rightarrow -\frac{1}{2} < \sin 2x < \frac{1}{2} \Rightarrow -\frac{1}{2} < \frac{m-1}{4} < \frac{1}{2} \xrightarrow{\times 4} -2 < m-1 < 2$$

$$\Rightarrow \boxed{-1 < m < 3}$$

$$\tan x + \cot x = -3 \qquad a^3+b^3=(a+b)(a^2-ab+b^2) \quad (3)$$

$$3\pi < 4x < 4\pi \Rightarrow \frac{3\pi}{4} < x < \pi \Rightarrow 135 < x < 180 \Rightarrow$$ ربع ۲

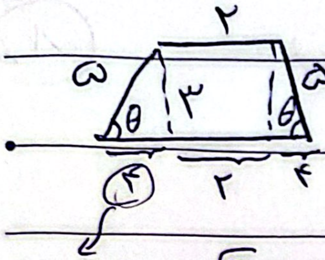
$$\frac{1}{\sin^3x+\cos^3x} = \frac{1}{(\sin x+\cos x)(1-\sin x\cos x)} = \frac{1}{\left(\frac{\sqrt3}{3}\right)\underbrace{\left(1+\frac{1}{3}\right)}_{\frac{4}{3}}} = \frac{9}{\sqrt3\times 4} \Rightarrow \boxed{\frac{3\sqrt3}{4}}$$

تربا

$$\tan x+\cot x=-3 \Rightarrow \frac{\sin^2x+\cos^2x}{\cos x\sin x} = \frac{1}{\cos x\sin x} = -3 \Rightarrow \cos x\sin x = \frac{-1}{3}$$

$$(\sin x+\cos x)^2 = \sin^2x+\cos^2x+2\sin x\cos x = 1+2\sin x\cos x$$

$$\Rightarrow 1+\left(2\times\frac{-1}{3}\right) = 1-\frac{2}{3} = \frac{1}{3} \Rightarrow \frac{\sqrt3}{3} = \sin x+\cos x$$



۴

$$\cos\theta = ۰/۶ \Rightarrow \frac{۶}{۱۰} = \frac{۳}{۵}$$

$$\Rightarrow S_{\square} = \frac{(۱۰+۲)\times ۳}{۲} = \boxed{۱۸}$$

$$۲۵ - ۹ = ۱۶ \Rightarrow \sqrt{x}\ ۴$$

۶

$$A = \sqrt{۳}\cos(۲۱۰)\sin(۲۷۰-۲۷) - \sqrt{۲}\sin(۱۳۵)\cos(۱۸۰-۲۷)$$

$$= \left(\sqrt{۳} \times -\frac{\sqrt{۳}}{۲} \times -\cos ۲۷\right) - \left(\sqrt{۲} \times \frac{\sqrt{۲}}{۲} \times -\cos ۲۷\right)$$

$$= \left(\frac{۳}{۲} \times \cos ۲۷\right) + (\cos ۲۷) = \frac{۵\cos ۲۷}{۲} \Rightarrow \boxed{\frac{۵}{۲}}$$

۵

$$\tan(۲۷۰+۱۵)\tan(-۱۸۰+۱۵) - \sin(۳۶۰+۱۵)\cos(۲۷۰-۱۵)$$

$$= (-\cot ۱۵ \times \tan ۱۵) - (\sin ۱۵ \times -\sin ۱۵) = -۱ + \sin^۲ ۱۵$$

$$= \sin^۲ ۱۵ - \sin^۲ ۱۵ - \cos^۲ ۱۵ = -\cos^۲ ۱۵ \Rightarrow \boxed{k = -۱}$$

۷

$$f(x) = ۱۶\left[\frac{\sin^۲(۳x)}{\sin^۲(۳x)}\right]\cos^۲(۳x)\cos^۲(۶x)\cos^۲(۱۲x)\cos^۲(۲۴x)$$

$$\Rightarrow \frac{۱۶ \times \sin^۲\left(\frac{۴۸x}{۳۶}\right)}{۴\times۴\times۴\times۴\times \sin^۲\left(\frac{۳x}{۳۶}\right)} = \frac{\frac{۳}{۴}}{۴\times۴\times\frac{۲-\sqrt{۳}}{۴}} = \cancel{۱۶\times(۲-\sqrt{۳})}$$

$$= \frac{۳}{۱۶(۲-\sqrt{۳})} \times \frac{(۲+\sqrt{۳})}{(۲+\sqrt{۳})} = \boxed{\frac{۶+۳\sqrt{۳}}{۱۶}}$$

$$\sin^۲\left(\frac{\pi}{۱۲}\right) = \frac{۱-\cos\frac{\pi}{۶}}{۲} = \frac{۱-\frac{\sqrt{۳}}{۲}}{۲} = \frac{۲-\sqrt{۳}}{۴}$$

۸

$$\frac{1-\sin x}{1+\sin x}=4 \Rightarrow 1-\sin x=4(1+\sin x)$$

$$\Rightarrow 5\sin x=-3 \Rightarrow \sin x=-\frac{3}{5}$$

$$\sin x=\frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \Rightarrow -\frac{3}{5}=\frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \Rightarrow$$

$$-3\left(1+\tan^2\frac{x}{2}\right)=10\tan\frac{x}{2} \Rightarrow 3\tan^2\frac{x}{2}+10\tan\frac{x}{2}+3=0$$

$$\Rightarrow \tan\frac{x}{2}=\frac{-10\pm\sqrt{64}}{6}=\frac{-10\pm 8}{6} \Rightarrow \boxed{\tan\frac{x}{2}=-3}$$

مقدار صحیح

۹

$$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta} \Rightarrow \frac{\sin^2\theta+1-\cos^2\theta}{\sin\theta(1-\cos\theta)}$$

$$\Rightarrow \frac{\sin^2\theta+\sin^2\theta+\cancel{\cos^2\theta}-\cancel{\cos^2\theta}}{\sin\theta(1-\cos\theta)}=\frac{2\sin^{\cancel{2}}\theta}{\cancel{\sin\theta}(1-\cos\theta)}$$

$$\Rightarrow \frac{2\sin\theta}{1-\cos\theta}=\frac{4\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{\sin^2\frac{\theta}{2}}=\boxed{4\cot\left(\frac{\theta}{2}\right) \Rightarrow k=4}$$

۱۰

$$\cos\left(\underbrace{\frac{11\pi}{4}}_{\text{ربع } 2}+\alpha\right)=\cos\frac{11\pi}{4}\cos\alpha-\sin\frac{11\pi}{4}\sin\alpha$$

$$=\left(-\frac{\sqrt{2}}{2}\right)\left(-\frac{7\sqrt{2}}{10}\right)-\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{10}\right)$$

$$\cos\frac{11\pi}{4}=\cos\left(\pi+\frac{7\pi}{4}\right)=-\frac{\sqrt{2}}{2}$$

$$\cos\pi\cos\frac{7\pi}{4}-\underbrace{\sin\pi}_{0}\sin\frac{7\pi}{4} \Rightarrow \boxed{\frac{7}{10}-\frac{1}{10}=\frac{6}{10}}$$