تحلیل شماره ۲۸۰ عرشیا رفیعی یازدهم سپهر B

-۱

$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} \Rightarrow \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow \sin\alpha \geq 0$ ربع اول یا دوم

$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha > 0$ ربع اول یا چهارم

α در ربع اول

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$-\frac{\pi}{12} < x < \frac{5\pi}{12} \Rightarrow -\frac{\pi}{6} < 2x < \frac{5\pi}{6} \Rightarrow -\frac{1}{2} < \sin 2x \leq 1$

$\Rightarrow -\frac{1}{2} < \frac{m-1}{4} \leq 1 \Rightarrow -2 < m-1 \leq 4 \Rightarrow -1 < m \leq 5$ $\boxed{(-1, 5]}$

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$3\pi < 4x < 4\pi \Rightarrow \frac{3\pi}{4} < x < \pi$ (ربع دوم)

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

$\frac{1}{\sin x \cos x} = -3 \Rightarrow \sin x \cos x = -\frac{1}{3}$

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

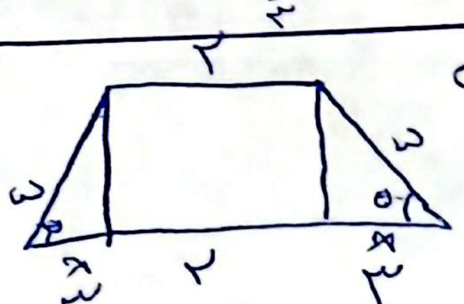
$\Rightarrow \sin x + \cos x = -\frac{\sqrt{3}}{3}$

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

$\Rightarrow \frac{1}{\left(-\frac{\sqrt{3}}{3}\right)\left(1 + \frac{1}{3}\right)} \Rightarrow \frac{9}{-4\sqrt{3}} = \boxed{-\frac{3\sqrt{3}}{4}}$

$\left(1 + \frac{1}{3} = \frac{4}{3}\right)$

-۴



$\cos\theta = \frac{6}{10} \Rightarrow \frac{6}{10} = \frac{x}{5} \Rightarrow x = 3$

مساحت ذوزنقه $= \frac{(2+8)\times 4}{2} = \boxed{20}$

$$\tan\left(\frac{3\pi}{2}+10^\circ\right)\times\tan(\pi-10^\circ)-\left(\sin\left(\frac{7\pi}{2}+10^\circ\right)\times\cos\left(\frac{3\pi}{2}-10^\circ\right)\right)=k\cos^2 10^\circ$$

$$\Rightarrow -\cot 10^\circ \times \tan 10^\circ - (\sin 10^\circ \times -\sin 10^\circ) = k\cos^2 10^\circ$$

$$\Rightarrow -1+\sin^2 10^\circ = k\cos^2 10^\circ \Rightarrow -\frac{(1-\sin^2 10^\circ)}{\cos^2 10^\circ} = k$$

$$\Rightarrow \boxed{k=-1}$$

$$\Rightarrow$$ [redacted]

٥- $\sqrt{2}\times\frac{\sqrt{2}}{2}\times\sin(\frac{\pi}{4}-A)-(\sqrt{2}\times\frac{1}{\sqrt{2}}\times\cos(\pi-A))$

$\cos(\frac{\pi}{4})$ $\quad$ $-\cos A$

$\Rightarrow \sin A\cos\frac{\pi}{4}+\cos A = \frac{\sin A\cos\frac{\pi}{4}}{\cos\frac{\pi}{4}} \Rightarrow \boxed{\Omega/1=\frac{1}{2}}$

٦-

$f(\frac{\pi}{24}) = 14\cos^2(\frac{\pi}{12})\cos^2(\frac{\pi}{6})\cos^2(\frac{\pi}{4})\cos^2(\frac{\pi}{3})$

$8\times2\cos^2(\frac{\pi}{12})\times\frac{3}{4}\times\frac{1}{2}\times\frac{1}{2}$

$\frac{\cos2\theta+1}{2}=\cos^2\theta \Rightarrow \cos2\theta+1=2\cos^2\theta$

$\Rightarrow 8\times(\cos(\frac{\pi}{6})+1)\times\frac{3}{4} = \frac{7}{2}\times\frac{1}{2}\times\frac{1}{2} = \boxed{\frac{7\sqrt{3}+8}{8}}$

$1+\frac{\sqrt{3}}{2}$

٧-

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

$\cos^2x=1-\sin^2x \Rightarrow \cos x=0 \Rightarrow x=\frac{\pi}{2}$

$\tan\frac{x}{2}=\frac{\sin x}{1+\cos x} \Rightarrow \tan\frac{\pi}{4}=\frac{1}{1+0}=1$

٩-

$\frac{\sin\theta}{1+\cos\theta}=\tan\frac{\theta}{2} \Rightarrow \frac{1+\cos\theta}{\sin\theta}=\cot\frac{\theta}{2}$

$\frac{1-\cos\theta}{\sin\theta}=\tan\frac{\theta}{2} \Rightarrow \frac{\sin\theta}{1-\cos\theta}=\cot\frac{\theta}{2}$

$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=k\cot\frac{\theta}{2} \Rightarrow \cot\frac{\theta}{2}+\cot\frac{\theta}{2}=k\cot\frac{\theta}{2}$

$\Rightarrow \boxed{k=2}$

$\cot\frac{\theta}{2}$ $\quad$ $\cot\frac{\theta}{2}$

$1-\sin^2\alpha = \cos^2\alpha \Rightarrow 1-\frac{4}{100} = \cos^2\alpha \Rightarrow \cos\alpha = -\frac{\sqrt{96}}{100}$ -10

$\cos\left(\frac{11\pi+3\pi}{4}+\alpha\right) \Rightarrow \cos\left(2\pi+\frac{3\pi}{4}+\alpha\right) \Rightarrow \cos\left(\frac{3\pi}{4}+\alpha\right)$

$= \cos\frac{3\pi}{4}\cos\alpha - \sin\frac{3\pi}{4}\sin\alpha \Rightarrow -\frac{\sqrt{2}}{2} \times -\frac{\sqrt{96}}{10} - \left(\frac{\sqrt{2}}{2} \times \frac{\sqrt{4}}{10}\right)$

$= \frac{\sqrt{2}\times\sqrt{3}}{20} - \frac{2}{20} = \frac{2}{10} - \frac{1}{10} = \boxed{0/4}$