۱۲,۲۵

ژینا علیجانی ۱۱ دخو سه شنبه

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۱ـ

$$\frac{\cos\alpha}{\sin\alpha}=\frac{\cos\alpha}{|\sin\alpha|} \Longrightarrow \sin\alpha>0$$

$$\frac{1}{|\cos\alpha|}-\frac{\sin\alpha}{\cos\alpha}=\frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha>0$$

} ناحیه اول

۶

۲ـ

$$-\frac{\pi}{۶}<۲x<\frac{۵\pi}{۶} \longrightarrow$$

$$\Rightarrow -\frac{1}{۲}<\sin ۲x\leq 1$$

$$-\frac{1}{۲}<\frac{m-1}{۴}<1$$

$$\Rightarrow -1<m\leq ۵$$

۱,۷۵

۳ـ

$$\tan x+\cot x=\frac{1}{\frac{1}{۲}\sin ۲x}=-۳ \Rightarrow \sin ۲x=\frac{-۲}{۳} \Rightarrow \sin x\cos x=\frac{-1}{۳}$$

$$\frac{1}{\sin^۳x+\cos^۳x}=\frac{1}{(\sin x+\cos x)(\sin^۲x+\cos^۲x-\sin x\cos x)}$$

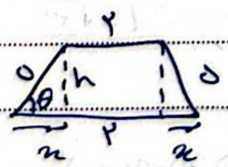
$$=\frac{1}{(\sin x+\cos x)(1+\frac{1}{۳})}=\frac{1}{\frac{۴}{۳}(\sqrt{۲}\sin(x+\frac{\pi}{۴}))}$$

۵

$$\frac{۳\pi}{۴}<x<\pi \longrightarrow \pi<x+\frac{\pi}{۴}<\pi+\frac{\pi}{۴} \longrightarrow -\frac{\sqrt{۲}}{۲}<\sin(x+\frac{\pi}{۴})<0$$

$$\Rightarrow \frac{-۴}{۳}<\frac{۴\sqrt{۲}}{۳}\sin(x+\frac{\pi}{۴})<0$$

۴ـ



$$\cos\theta=\frac{x}{۵}=\frac{۶}{10} \Rightarrow x=۳$$

۶

$$h \xrightarrow{\text{مثلث طلایی}} \underline{\underline{۴}}$$

$$S_{\text{ذوزنقه}}=\frac{1}{۲}(۴)(۲+۲+۳+۳)$$

$$\Rightarrow \underline{\underline{S=۲0}}$$

Arman

$\tan(\frac{3\pi}{2} - 15) = \cot 15 \qquad \tan(-165) = \tan(15)$ —۵

$\sin(1095) = \sin(15) \qquad \cos(\frac{3\pi}{2} - 15) = -\sin(15)$ ۴

$\underbrace{\cot(15)\tan(15)}_{1} - \sin(15)(-\sin(15)) = \underbrace{1 + \sin^2 15}$

$\sin^2 15 = \frac{1-\cos 30}{2} = \frac{1-\frac{\sqrt{3}}{2}}{2} = \frac{2-\sqrt{3}}{4} \qquad 1 + \frac{2-\sqrt{3}}{4} = \frac{6-\sqrt{3}}{4}$

$\sqrt{3}\cos(210) = \sqrt{3} \times (-\frac{\sqrt{3}}{2}) = -\frac{3}{2}$ —۶

$\sin(243) = \sin(\frac{3\pi}{2} - 27) \Rightarrow -\cos 27$ ۲

$-\sqrt{2}\sin(135) = -\sqrt{2} \times \frac{\sqrt{2}}{2} = -1$

$\cos(153) = -\cos 27$

$A = \frac{-3}{2}(-\cos 27) + \cos 27 = \frac{5}{2}\cos 27$ ۵/۲ برابر

$\left(\frac{\sin^2(3x)}{\sin^2(3x)}\right) 16\cos^2(3x)\cos^2(6x)\cos^2(12x)\cos^2(24x)$ —۷ ۰٫۵

$= 8\sin^2 6x \times \cos^2 6x = 4\sin^2 12x \times \cos^2 12x = 2\sin^2 24x \times \cos^2 24x$

$= \frac{\sin^2(48x)}{\sin^2(3x)} = \frac{\sin^2(\frac{4\pi}{3})}{\sin^2(\frac{\pi}{12})} = \frac{(-\frac{\sqrt{3}}{2})^2}{\frac{1-\cos\frac{\pi}{6}}{2}} = \frac{\frac{3}{4}}{\frac{1-\frac{\sqrt{3}}{2}}{2}} = 6 + 3\sqrt{3}$

$\frac{1-\sin x}{1+\sin x} = 4 \rightarrow 1 - \sin x = 4 + 4\sin x \Rightarrow \sin x = \frac{-3}{5}$ —۸ ۲

$\Rightarrow \cos x = \frac{-4}{5} \qquad \tan\frac{x}{2} = \frac{\sin x}{1+\cos x} = \frac{-\frac{3}{5}}{1-\frac{4}{5}} = -3$

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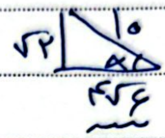
$$\frac{\sin\theta}{1-\cos\theta}=\cot\frac{\theta}{۲} \qquad \frac{1+\cos\theta}{\sin\theta}=\cot\frac{\theta}{۲}$$ —۹

۵

$$\Rightarrow K\cot\frac{\theta}{۲}=۲\cot\frac{\theta}{۲} \Rightarrow K=۲$$

$$\cos\left(\frac{۱۱\pi}{۴}+\alpha\right)=\cos\left(\frac{۳\pi}{۴}+\alpha\right)=$$ —۱۰



۹

$$=\cos\frac{۳\pi}{۴}\cdot\cos\alpha-\sin\frac{۳\pi}{۴}\cdot\sin\alpha$$

$$=\frac{\sqrt{۲}}{۲}\cdot\frac{۴\sqrt{۶}}{۱۰}-\frac{\sqrt{۲}}{۲}\cdot\frac{\sqrt{۲}}{۱۰}=\frac{-۱+۴\sqrt{۳}}{۱۰}$$

۳) $$\frac{\sin^2 x+\cos^2 x}{\sin x\cos x}=-۳ \rightarrow \sin x\cos x=\frac{-۱}{۳}=A$$

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

$$A^2=\sin^2 x+\cos^2 x+۲\sin x\cos x=\frac{1}{۳}$$

$$\rightarrow A \begin{cases} \frac{1}{\sqrt{۳}} & \times \\ \frac{-1}{\sqrt{۳}} & \checkmark \end{cases} \qquad \rightarrow \frac{-۹}{۴\sqrt{۳}}=-۰/۷۵\sqrt{۳}$$

۵) $$\tan(۲۷۰+۱۵)\tan(۱۵-۱۸۰)-\sin(۲\times ۲۴۰+۱۵)\cos(۲۷۰-۱۵)$$

$$-\cot ۱۵^\circ\times\tan ۱۵^\circ-\sin ۱۵^\circ-\sin ۱۵^\circ=-\cos^2 ۱۵^\circ \rightarrow k=-۱$$

۷) $$f\left(\frac{\pi}{۲۴}\right)=۱۶\cos^2\left(\frac{\pi}{۱۲}\right)\cos^2\left(\frac{\pi}{۶}\right)\cos^2\left(\frac{\pi}{۳}\right)\cos^2\left(\frac{۲\pi}{۳}\right)$$

$$\cos^2\frac{\pi}{۱۲}=\frac{1+\cos\frac{\pi}{۶}}{۲}=\frac{۲+\sqrt{۳}}{۴}$$

$$۱۶\left(\frac{۲+\sqrt{۳}}{۴}\right)\times\frac{۳}{۴}\times\frac{1}{۴}\times\frac{1}{۴}=\frac{۳(۲+\sqrt{۳})}{۱۶}$$

۱۰) $$\cos\left(\frac{۱۱\pi}{۴}+\alpha\right)=-\left(\cos\alpha\cos\frac{\pi}{۴}+\sin\alpha\sin\frac{\pi}{۴}\right)$$

Arman

$$\rightarrow \frac{-\sqrt{۲}}{۲}(\cos\alpha+\sin\alpha) \qquad \cos\alpha=\frac{-۷\sqrt{۲}}{۱۰}$$

$$\rightarrow -\frac{\sqrt{۲}}{۲}\left(\frac{-۷\sqrt{۲}}{۱۰}+\frac{\sqrt{۲}}{۱۰}\right)=\frac{۳}{۵}$$