آزمون آنلاین — کلاس A — تکلیف ۲۸

۲۵ آفرین!

۱-

$$\frac{1}{\sqrt{\cos^2\alpha}}\cdot\frac{1}{\cot\alpha}=\frac{|-\sin\alpha|}{|\cos\alpha|}\ ,\ \cot\alpha=\frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}}$$

(۲)

ناصح اول

$$\cot\alpha=\frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}}\rightarrow\frac{\cos\alpha}{\sin\alpha}=\frac{\cos\alpha}{\sqrt{\sin^2\alpha}}=\frac{\cos\alpha}{|\sin\alpha|}\rightarrow\sin\alpha>0$$

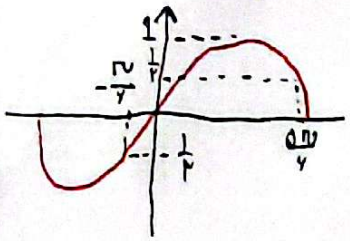
$$\frac{1}{\sqrt{\cos^2\alpha}}=\frac{1}{\cot\alpha}=\frac{1-\sin\alpha}{|\cos\alpha|}\rightarrow\frac{1}{|\cos\alpha|}-\frac{1-\sin\alpha}{|\cos\alpha|}=\frac{\sin\alpha}{\cos\alpha}\rightarrow\frac{\sin\alpha}{|\cos\alpha|}=\frac{\sin\alpha}{\cos\alpha}\rightarrow\cos\alpha>0$$

۲-

$$-\frac{\pi}{12}<x<\frac{5\pi}{12}\ ,\ \sin^2 3x=\frac{m-1}{2}$$

(۲)

$$\hookrightarrow\frac{-\pi}{4}<3x<\frac{5\pi}{4}\xrightarrow{t=3x}-\frac{\pi}{4}<t<\frac{5\pi}{4}$$



$$\rightarrow-\frac{1}{2}<\sin t\leq 1\rightarrow-\frac{1}{2}<\frac{m-1}{2}\leq 1\rightarrow m\in(-1,3]$$ ✓

۳-

$$\tan x+\cot x=-3\qquad 4\pi>2x>3\pi$$

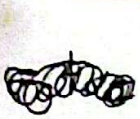
(۲)

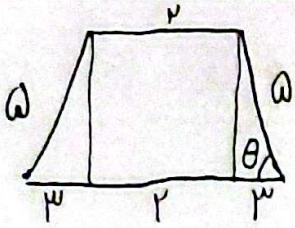
$$\frac{\sin x}{\cos x}+\frac{\cos x}{\sin x}=-3\rightarrow\sin x\cos x=-\frac{1}{3}\qquad(\sin x+\cos x)^2=\sin^2x+\cos^2x+2\sin x\cos x=1-\frac{2}{3}=\frac{1}{3}$$

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

دقت!

$$\frac{1}{\sin^3x+\cos^3x}=\frac{1}{(\sin x+\cos x)(\sin^2x-\sin x\cos x+\cos^2x)}=\frac{1}{-\frac{1}{\sqrt{3}}\left(1+\frac{1}{3}\right)}=-\frac{3}{4}\sqrt{3}$$





$$\cos\theta = \frac{6}{10} = \frac{h}{8} \rightarrow h = 4.8$$

$$S = \frac{(4+8)\times 4.8}{2} = 28.8$$ ✓

-۵

$$\tan(28\omega)\tan(-12\omega) - \sin(10.9\omega)\cos(28\omega) = -\cot(10\omega)\times\tan(10\omega) + \sin 10\omega \times -\sin 10\omega$$

$$= -1 + \sin^2 10\omega = -\cos^2 10\omega \Rightarrow \boxed{k=-1}$$ ✓

-۶

$$A = \sqrt{3}\cos(210)\sin(216) - \sqrt{2}\sin(132)\cos(108)$$

$$= \sqrt{3}\cos(180+30)\sin(270-54) - \sqrt{2}(90+42)\cos(180-72) = \sqrt{3}(-\cos 30)(-\cos 54) - \sqrt{2}(\sin 42)(-$$

$$= \sqrt{3}\left(\frac{\sqrt{3}}{2}\right)\cos 54 + \sqrt{2}\left(\frac{\sqrt{2}}{2}\right)\cos 54 = \frac{5}{2}\cos 54 \Rightarrow$$ ✓

-۷

$$f(x) = 16\cos^2(4x)\cos^2(2x)\cos^2(16x)\cos^2(32x)$$

$$f\left(\frac{\pi}{96}\right) = 16\cos^2\left(\frac{\pi}{12}\right)\cos^2\left(\frac{\pi}{24}\right)\cos^2\left(\frac{\pi}{6}\right)\cos^2\left(\frac{\pi}{3}\right) = 16\cos^2\frac{\pi}{12}\left(\frac{\sqrt{3}}{2}\right)^2\left(\frac{1}{2}\right)^2\left(-\frac{1}{2}\right)^2 = 3\cos^2\frac{\pi}{12}$$

$\cos^2\alpha = \frac{1}{2}(1+\cos 2\alpha)$

$$\rightarrow f\left(\frac{\pi}{96}\right) = 3\times\frac{1}{2}\left(1+\cos\frac{\pi}{6}\right) = \frac{3}{2}\left(1+\frac{\sqrt{3}}{2}\right) = \frac{6+3\sqrt{3}}{4}$$ ✓

-۸

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

$$-\sin x = \frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \rightarrow -\frac{1}{3} = \frac{2\tan\frac{x}{2}}{1+\tan^2\frac{x}{2}} \rightarrow 3\tan^2\frac{x}{2} + 6\tan\frac{x}{2} + 3 = 0$$

$$\tan\frac{x}{2} = \frac{-6\pm\sqrt{36-36}}{6} = \frac{-6\pm 0}{6} \rightarrow \tan\frac{x}{2} = -1$$ ✓ , $-\frac{1}{3}$ ✗ $\rightarrow \tan\frac{x}{2} = -3$ ✓

آزمون آزمایشی — کلاس A

$$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=\frac{\sin^2\theta+1-\cos^2\theta}{(1-\cos\theta)(\sin\theta)}\equiv\frac{2\sin^2\theta}{(1-\cos\theta)\sin\theta}=\frac{2\sin\theta}{1-\cos\theta}=\frac{4\times\sin\frac{\theta}{2}\times\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}}$$

-۹ (۲)

$$\rightarrow \frac{2\cos\frac{\theta}{2}}{\sin\frac{\theta}{2}}=2\cot\frac{\theta}{2}\Rightarrow k=2$$ ✓

(۲) -۱۰

$$A=\cos\left(\frac{11\pi}{4}+\alpha\right)=\cos\left(3\pi-\frac{\pi}{4}+\alpha\right)=-\cos\left(\alpha-\frac{\pi}{4}\right)=-\left(\cos\alpha\cos\frac{\pi}{4}+\sin\alpha\sin\frac{\pi}{4}\right)$$

$$\rightarrow -\frac{\sqrt{2}}{2}(\sin\alpha+\cos\alpha)\quad,\quad \cos^2\alpha=1-\sin^2\alpha=1-\frac{2}{100}=\frac{49}{50}\rightarrow\cos\alpha=\frac{-7}{5\sqrt{2}}=-\frac{7\sqrt{2}}{10}$$

$$\hookrightarrow A=-\frac{\sqrt{2}}{2}\left(-\frac{\sqrt{2}}{10}-\frac{7\sqrt{2}}{10}\right)=\frac{4}{5}$$ ✓