آیناز کریم زاده - یازدهم اختر B - تکلیف ۲۸

-۱

$\frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \cot\alpha$ / $\frac{1}{\sqrt{\cos^2\alpha}} - \frac{1}{\cot\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|}$ / ناحیه اول = انتهای کمان α

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

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

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$-\frac{\pi}{12} < x < \frac{5\pi}{12}$

$\sin 2x = \frac{m-1}{4}$

$\to -\frac{\pi}{6} < 2x < \frac{5\pi}{6}$

$-\frac{1}{2} < \sin 2x \le 1 \to -\frac{1}{2} < \frac{m-1}{4} \le 1 \to -2 < m-1 \le 4 \to -1 < m \le 5$

-۳

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

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

$\pm\sqrt{\frac{1}{3}}$

$3\pi < 4x < 4\pi \to \frac{3\pi}{4} < x < \pi$

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

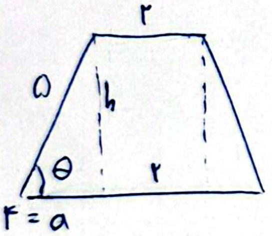
$\sqrt{\frac{1}{3}} = |\sin x + \cos x| \xrightarrow[\cos x > \sin x]{} -\sqrt{\frac{1}{3}} = \sin x + \cos x$ ✓

-۴

$\cos\theta = 0.6 = \frac{6}{10} = \frac{h}{5} \to 3$

$\sin\theta = 0.8 = \frac{8}{10} = \frac{a}{5} \to 4$

$S = \frac{(2+10)}{2} 3 = 18$ ✓



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$\tan(285)\tan(-165) - \sin(1095)\cos(255) = k\cos^2 15 \to \underbrace{\tan(270+15)}_{-\cot 15}\underbrace{\tan(180-15)}_{-\tan 15} = 1$

$\underbrace{\sin(1080+15)}_{\sin 15}\underbrace{\cos(270-15)}_{\sin 15} = \sin^2 15$

$\Rightarrow 1 - \sin^2 15 = \cos^2 15 = k\cos^2 15 \quad k = 1$

-۶

$\underbrace{(\sqrt{3}\cos 210)}_{-\sqrt{3}\times\frac{\sqrt{3}}{2}}\underbrace{\sin(243)}_{\sin(\frac{3\pi}{2} - 27) = -\cos 27} - \underbrace{\sqrt{2}\sin(135)}_{\sqrt{2}\times\frac{\sqrt{2}}{2} = 1}\underbrace{\cos(153)}_{\cos(180-27) = -\cos 27} = A \to \frac{3}{2}\times\cos 27 + \cos 27 = \frac{5}{2}\cos 27$

برابر $\frac{5}{2}$

آیلار کریم زاده

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$f(x)=16\cos^2(12x)\cos^2(24x)\cos^2(48x)\cos^2(96x) \longrightarrow f(\frac{\pi}{144})=16\cos^2(\frac{\pi}{12})\underbrace{\cos^2(\frac{\pi}{6})}_{\frac{3}{4}}\underbrace{\cos^2(\frac{\pi}{3})}_{\frac{1}{4}}\underbrace{\cos^2(\frac{2\pi}{3})}_{\frac{1}{4}}$

$\rightarrow \frac{3}{4}\cos^2\frac{\pi}{12} = \boxed{\frac{6+3\sqrt{3}}{16}}$

$\cos^2\frac{\pi}{12} = \frac{1+\cos\frac{\pi}{6}}{2} = \frac{1+\frac{\sqrt{3}}{2}}{2} = \frac{2+\sqrt{3}}{4}$

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ربع x → چهارم

$\frac{1-\sin x}{1+\sin x}=4 \qquad 1-\sin x = 4+4\sin x \rightarrow -3 = 5\sin x \rightarrow \sin x = -\frac{3}{5}$

$\cos x = -\frac{4}{5}$

$\tan\frac{x}{2} = \frac{1-\cos x}{1+\cos x} = \frac{1+\frac{4}{5}}{1-\frac{4}{5}} = \boxed{9}$

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$\underbrace{\frac{\sin\theta}{1-\cos\theta}}_{\cot\frac{\theta}{2}} + \underbrace{\frac{1+\cos\theta}{\sin\theta}}_{\cot\frac{\theta}{2}} =$

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

$\rightarrow 2\cot\frac{\theta}{2} \Rightarrow \underline{k=2}$

۱۰-

ربع α → چهارم

$\sin\alpha = \frac{\sqrt{2}}{10} \qquad \cos(\frac{11\pi}{4}+\alpha) = \cos(\frac{6\pi}{4}+\frac{5\pi}{4}+\alpha) = \sin(\frac{5\pi}{4}+\alpha) = -\sin(\frac{\pi}{4}+\alpha)$

$\frac{\sin\alpha+\cos\alpha}{\sqrt{2}} = -\sin(\frac{\pi}{4}+\alpha) = \frac{8\sqrt{2}}{2} = 8$