نام و نام خانوادگی: آیسان عقیلی — تکلیف: ۲۸ — کلاس: یازدهم ریاضی

۲۰

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

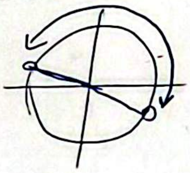
$\frac{1}{\cot\alpha} = \tan\alpha$

$\frac{\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \to \cos\alpha > 0$ ۱

$\to \cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|} \to \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \to \sin\alpha > 0$ — α ناحیه (۱)

$1-\cos^2\alpha = \sin^2\alpha$

$-\frac{\pi}{12} < x < \frac{5\pi}{12} \to -\frac{\pi}{6} < 2x < \frac{5\pi}{6}$



$-\frac{1}{2} < \sin 2x \le 1$

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

$-\frac{1}{2} < \frac{m-1}{4} \le 1$ $) \times 4$

$-2 < m-1 \le 4$

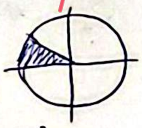
$-1 < m \le 5$ ۲

$\tan x + \cot x = -4 \to \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{1}{\sin x\cos x} = -4 \to \sin x\cos x = -\frac{1}{4}$

$3\pi < 4x < 4\pi$

$\to \frac{1}{\sin^3 x + \cos^3 x} = \frac{1}{(\sin x+\cos x)(1-\sin x\cos x)} = \frac{3}{4} \times \frac{1}{\sin x + \cos x}$

میل دهیم ($\sin x\cos x = -\frac{1}{4}$)

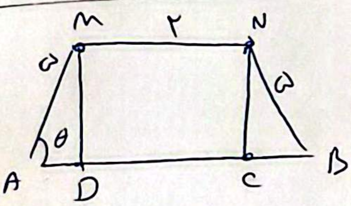


از طرفی $(\sin x+\cos x)^2 = 1 + 2(\sin x\cos x) = 1 - \frac{2}{4} = \frac{1}{2}$

$\sin x + \cos x = \frac{\sqrt{2}}{2}$ × — چون $\frac{3\pi}{4} < x < \pi$

$\sin x + \cos x = -\frac{\sqrt{2}}{2}$ وقتی چون $|\sin x| < |\cos x|$ در این ناحیه است پس $\sin x + \cos x$ منفی می‌باشد ۳

جواب نهایی: $\frac{3}{4} \times \frac{1}{\sin x + \cos x} = \frac{3}{4} \times \frac{-2}{\sqrt{2}} = -\frac{3\sqrt{2}}{4}$



$\cos\theta = 0.6 \to \sin\theta = 0.8$

$MD = $ ارتفاع $= 5\cdot\sin\theta = 5\times 0.8 = 4$

طول $AB = CD + 2\times AD = 2 + 2(5\times\cos\theta) = 8$ ۴

$S_{\text{ذوزنقه}} = \frac{\text{ارتفاع} \times \text{مجموع ۲ قاعده}}{2} = \frac{(2+8)\times 4}{2} = 20$

$\tan(285°)\tan(-165°) - \sin(195°)\cos(255°) = k\cos^2 15$

$\tan(\frac{3\pi}{2}+15)\tan(-\pi+15) - \sin(15)\cos(\frac{3\pi}{2}-15)$ ۵

$-\cot(15)\tan(15) - \sin(15) \cdot -\sin(15) = -\cot(15)\tan(15) + \sin^2(15) = \sin^2(15) - 1$

$k\cos^2 15 = -\cos^2(15)$

$k = -1$

$A = \sqrt{2}\underbrace{\cos(210^\circ)}_{-\frac{\sqrt{2}}{2}}\sin(242^\circ) - \sqrt{2}\underbrace{\sin(135^\circ)}_{\frac{\sqrt{2}}{2}}\cos(152^\circ) = -\frac{3}{2}\sin(242^\circ) - \cos(152^\circ)$ 7

$= -\frac{3}{2}\sin\left(\frac{3\pi}{2} - 27^\circ\right) - \cos(\pi - 27) = +\frac{3}{2}\cos(27) + \cos(27) = \frac{\frac{5}{2}\cos(27)}{\cos(27)}$; $\frac{5}{2}$ برابر

(2)

$f(x) = 16\cos^2(3x)\cos^2(6x)\cos^2(12x)\cos^2(24x)$

$f\left(\frac{\pi}{24}\right) = 16\cos^2\left(\frac{\pi}{12}\right)\cos^2\left(\frac{\pi}{4}\right)\cos^2\left(\frac{\pi}{2}\right)\cos^2\left(\frac{3\pi}{2}\right) = 16\times\frac{2}{4}\times\frac{1}{4}\times\frac{1}{4}\cos^2\left(\frac{\pi}{12}\right) = \frac{3}{4}\cos^2\left(\frac{\pi}{12}\right)$

$\left(\frac{\sqrt{2}}{2}\right)^2 \quad \left(\frac{1}{2}\right)^2 \quad \left(-\frac{1}{2}\right)^2$

از طرفی $\cos^2\left(\frac{\pi}{12}\right) = \frac{1+\cos\left(\frac{\pi}{6}\right)}{2}$ (فرمول طلایی)

$\cos^2\left(\frac{\pi}{12}\right) = \frac{\sqrt{2}+3}{4} \rightarrow \frac{3}{4}\times\frac{\sqrt{2}+3}{4}$

$= \frac{3\sqrt{2}+9}{16}$

$x \rightarrow (2)$

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

$5\sin x = -3 \rightarrow \sin x = -\frac{3}{5}$ $\quad$ (مثلث: ۵، ۳، ۴) $\quad \cos x = -\frac{4}{5}$ (1) 8

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

$\frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = k\cot\frac{\theta}{2}$ $\quad$ * $\tan\frac{\theta}{2} = \frac{\sin\theta}{1+\cos\theta} = \frac{1-\cos\theta}{\sin\theta}$

$\frac{1}{\tan\frac{\theta}{2}} \quad \frac{1}{\tan\frac{\theta}{2}} = \cot\frac{\theta}{2} + \cot\frac{\theta}{2} = 2\cot\frac{\theta}{2} = k\cot\frac{\theta}{2}$ (2) 9

$k = 2$

$\alpha \rightarrow (3)$ $\quad$ (مثلث: ۱۰، $\sqrt{2}$، $\sqrt{98}$) $\quad \cos\alpha = -\frac{\sqrt{98}}{10}$

$\sin\alpha = \frac{\sqrt{2}}{10}$ (2)

$\cos\left(\frac{11\pi}{4} + \alpha\right) \xrightarrow{\frac{11\pi}{4} = \frac{3\pi}{4}} \cos\left(\frac{3\pi}{4} + \alpha\right) = \cos\left(\frac{3\pi}{4}\right)\cos\alpha - \sin\left(\frac{3\pi}{4}\right)\sin\alpha$ 10

$= -\frac{\sqrt{2}}{2}\cos\alpha - \frac{\sqrt{2}}{2}\sin\alpha = -\frac{\sqrt{2}}{2}(\cos\alpha + \sin\alpha) = -\frac{\sqrt{2}}{2}\left(\frac{\sqrt{2}}{10} - \frac{\sqrt{98}}{10}\right) = -\frac{2}{20} + \frac{\sqrt{196}}{20} = \frac{12}{20} = 0/6$