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آلا دینی‌نژاد — سبحان خدا — تکلیف 28

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

ناحیه ؟

$\frac{1}{|\cos\alpha|} - \tan\alpha = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} \rightarrow$ اینجا کدوم ؟

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

$\hookrightarrow \cos\alpha > 0 \qquad \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \rightarrow \sin\alpha > 0$

② $\sin 2x = \frac{m-1}{4} \quad \left(-\frac{\pi}{12} < x < \frac{5\pi}{12}\right) \xrightarrow{\times 2}$

$-\frac{\pi}{6} < 2x < \frac{5\pi}{6} \longrightarrow \sin \rightarrow -\frac{1}{2} < \sin 2x \leq 1$

$-\frac{1}{2} < \frac{m-1}{4} \leq 1 \qquad -2 < m-1 \leq 4 \longrightarrow -1 < m \leq 5$

$(-1, 5]$

③ $\frac{\cos^2 x + \sin^2 x}{\sin x \cos x} = -3 \longrightarrow \sin x \cos x = -\frac{1}{3} \qquad \frac{1}{-\frac{1}{\sqrt{3}} \times \frac{2}{3}} = \frac{-3\sqrt{3}}{2}$

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

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

ناحیه ۳ $|\sin x| < |\cos x| \qquad \sin x + \cos x = -\frac{1}{\sqrt{3}}$

$3\pi < 4x < 4\pi \;, \quad \frac{3\pi}{4} < x < \pi$

Senobar

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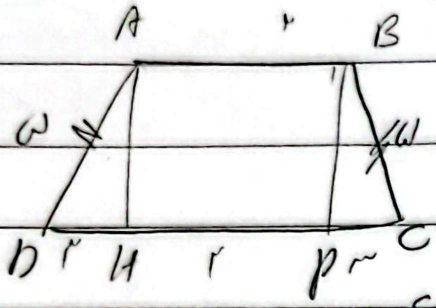

$\cos\theta = \frac{6}{10}$, $\frac{DH}{AD} = \frac{6}{10}$

$DH = 3 = CP$

$AH = 4 \ (\sqrt{25-9})$

$S = \frac{(2+8)\times 4}{2} = 20$

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$\tan(270+15)\tan(-180+15) - \sin(180+15)\cos(270-15) \Rightarrow$

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

$-(+1 - \sin^2 15) = -\cos^2 15 = k\cos^2 15$, $k=-1$

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$A = \sqrt{3}\cos(180+30)\sin(270-27) - \sqrt{2}\sin(90+45)$

$\cos(180-27) \rightarrow \sqrt{3}(-\cos 30)(-\cos 27) \times$

$-\sqrt{2}(\sin 45)(-\cos 27) = \sqrt{3}\left(\frac{\sqrt{3}}{2}\right)\cos 27 + \sqrt{2}\,\frac{\sqrt{2}}{2}(\cos 27)$

$= \frac{\frac{5}{2}(\cos 27)}{\cos 27}$ جواب $\frac{5}{2}$

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

$\cos^2\left(\frac{\pi}{12}\right) = \cos^2 15 = \frac{1+\cos 30}{2}$

$\cos^2 15 = \frac{2+\sqrt{3}}{4}$, $16 \times \frac{2+\sqrt{3}}{4} \times \frac{3}{4} \times \frac{1}{4} \times \frac{-1}{4}$

$\frac{-6+3\sqrt{3}}{16}$

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

$+\left(1-\sin x=\frac{4}{5}+\frac{3}{5}\sin x\right)\quad -\frac{2}{5}\sin x$

$\sin x=-\frac{4}{5}$ نتیجه $\cos x=-\frac{3}{5}$ ω 4

$\frac{\sin\theta}{1+\cos\theta}=\tan\frac{\theta}{2}$, $\frac{1+\cos\theta}{\sin\theta}=\cot\frac{\theta}{2}$ (B)

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

جواب $=2=k$

$\cos\alpha<0$, $\sin\alpha>0$ ربع دوم (10)

$\sin^2\alpha+\cos^2\alpha=1\qquad \left(\frac{\sqrt{2}}{10}\right)^2+\cos^2\alpha=1$

$\frac{2}{100}+\cos^2\alpha=1\longrightarrow\cos(\alpha)=\pm\sqrt{\frac{98}{100}}=\pm\frac{7}{10}$

نتیجه $\cos\alpha=-\frac{7}{10}$ $\leftarrow$ کسینوس منفی

$\frac{-7}{10}\times\frac{\sqrt{2}}{\sqrt{2}}=\frac{-7\sqrt{2}}{10}\qquad \frac{11\pi}{4}=\frac{8\pi}{4}+\frac{3\pi}{4}=2\pi+\frac{3\pi}{4}$

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

Senobar

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$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$B < \alpha \qquad A = \frac{3\pi}{4}$

$\cos\frac{3\pi}{4} = \frac{-\sqrt{2}}{2} \qquad \sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

$\cos\left(\frac{3\pi}{4}+\alpha\right) = \left(\frac{-\sqrt{2}}{2}\right)\left(\frac{-7\sqrt{2}}{10}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{34}}{10}\right)$

$= \left(\frac{7\times 2}{20}\right) - \frac{2}{20} = \frac{14}{20} - \frac{2}{20} = \frac{12}{20} = \frac{3}{5}$