Subject. Day. Month. Year.

۲۰

آموزش یاری   تکلیف شماره ۲۸   یازدهم رشته A

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

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

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

⇐ با توجه به ① و ② در ناحیه اول است.

۲- $\sin 2x = \frac{m-1}{4}$ $\frac{-\pi}{12} < x < \frac{5\pi}{12} \xrightarrow{\times 2} \frac{-\pi}{6} < 2x < \frac{5\pi}{6}$

$\to \frac{-1}{2} < \sin 2x \le 1 \to \frac{-1}{2} < \frac{m-1}{4} \le 1 \to -2 < m-1 \le 4 \to -1 < m \le 5$ ۵

$\to$ جواب: $(-1, 5]$

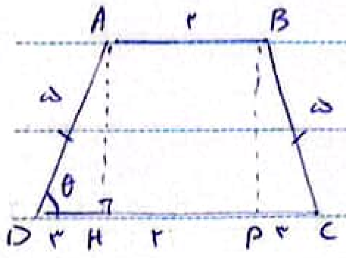
۳- $\tan x + \cot x = -3 \to \frac{\cos^2 x + \sin^2 x}{\sin x \cos x} = -3 \Rightarrow \sin x \cos x = \frac{-1}{3}$

$(\sin x + \cos x)^2 = \sin^2 x + \cos^2 x + 2\sin x\cos x = 1 + 2(\frac{-1}{3}) = \frac{1}{3} \to \sin x + \cos x$: $\frac{1}{\sqrt3}$ ✗ , $\frac{-1}{\sqrt3}$ ✓

$3\pi < 4x < 4\pi \to \frac{3\pi}{4} < x < \pi \to$ ناحیه دوم $|\sin x| < |\cos x|$

$\Rightarrow \sin x + \cos x = \frac{-1}{\sqrt3}$ ۵

$\frac{1}{\sin^3 x + \cos^3 x} = \frac{1}{(\sin x + \cos x)(\sin^2 x + \cos^2 x - \sin x \cos x)} = \frac{1}{\frac{-1}{\sqrt3} \times \frac{4}{3}} = \frac{-3\sqrt3}{4}$

۴- 

$\cos\theta = \frac{6}{10} \to \frac{DH}{AD} = \frac{6}{10} \to DH = 3 = PC$

فیثاغورس $\to AH = \sqrt{25-9} = 4$ ۵

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

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$\tan(285)\tan(-165) - \sin(1095)\cos(255)$

$= \tan(270+15)\tan(-180+15) - \sin(1080+15)\cos(270-15)$

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

$= -(\cos^2 15) = K\cos^2 15 \Rightarrow K = -1$

۶-

$A = \sqrt{3}\cos(210)\sin(243) - \sqrt{2}\sin(135)\cos(153)$

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

$= \sqrt{3}(-\cos 30)(-\cos 27) - \sqrt{2}(\sin 45)(-\cos 27) = \sqrt{3}\left(\frac{\sqrt{3}}{2}\right)(\cos 27) + \sqrt{2}\left(\frac{\sqrt{2}}{2}\right)(\cos 27)$

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

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

$\cos^2\left(\frac{\pi}{12}\right) = \cos^2 15 = \frac{1+\cos 30}{2} \Rightarrow \cos^2 15 = \left(\frac{\sqrt{2}+\sqrt{6}}{4}\right)^2 = \frac{2+\sqrt{3}}{4}$

$f\left(\frac{\pi}{24}\right) = 16 \times \frac{2+\sqrt{3}}{4} \times \frac{3}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{6+3\sqrt{3}}{16}$

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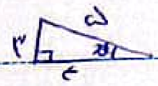
$\frac{1-\sin x}{1+\sin x} = 4 \Rightarrow 1-\sin x = 4+4\sin x \Rightarrow -3 = 5\sin x \Rightarrow \sin x = \frac{-3}{5}$



$\Rightarrow \cos x = \frac{4}{5} \xrightarrow{\text{ناحیه ۳}} \cos x = \frac{-4}{5}$

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

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$\frac{\sin\theta}{1+\cos\theta} = \tan\frac{\theta}{2} \xrightarrow{\text{معکوس}} \frac{1+\cos\theta}{\sin\theta} = \cot\frac{\theta}{2}$

$\frac{1-\cos\theta}{\sin\theta} = \tan\frac{\theta}{2} \xrightarrow{\text{معکوس}} \frac{\sin\theta}{1-\cos\theta} = \cot\frac{\theta}{2}$

$\Rightarrow \cot\frac{\theta}{2} + \cot\frac{\theta}{2} = 2\cot\frac{\theta}{2}$

$\Rightarrow K = 2$

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$$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos^2\alpha + \sin^2\alpha = 1 \xrightarrow{\text{ربع دوم}} \cos\alpha = -\sqrt{1-\sin^2\alpha} = -\sqrt{\frac{49}{50}} = \frac{-7}{5\sqrt{2}}$$ ۱۰-

$$\cos\left(2\pi+\frac{3\pi}{4}+\alpha\right) = \cos\left(\frac{3\pi}{4}+\alpha\right) = \cos\alpha\cos\frac{3\pi}{4} - \sin\alpha\sin\frac{3\pi}{4}$$

$$\Rightarrow \left(\frac{-7}{5\sqrt{2}} \times \frac{-\sqrt{2}}{2}\right) - \left(\frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2}\right) = \frac{7}{10} - \frac{1}{10} = \frac{6}{10} = \frac{3}{5}$$