سارا ساسانی یازدهم رشته A تکلیف شماره ۲۸

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

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

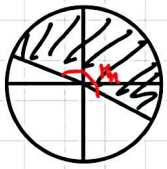
$\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha = |\cos\alpha| \Rightarrow \cos\alpha > 0$ ناحیه اول یا چهارم

$\cot\alpha = \frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \Rightarrow |\sin\alpha| = \sin\alpha \Rightarrow \sin\alpha > 0$ ناحیه اول یا دوم

} ناحیه اول

۲-

$\frac{-\pi}{12} < n < \frac{5\pi}{12} \Rightarrow \frac{-3\pi}{2} < 3n < \frac{10\pi}{12} \Rightarrow \frac{-\pi}{4} < 3n < \frac{5\pi}{4}$



$-\frac{1}{2} < \sin 3n < 1 \Rightarrow \frac{1}{2} < \frac{m-1}{4} < 1 \Rightarrow -2 < m-1 < 4 \Rightarrow -1 < m < 5$

۳-

$\tan n + \cot n = -3 \Rightarrow \frac{1}{\sin n\cos n} = -3 \Rightarrow \sin n\cos n = -\frac{1}{3}$

$3\pi < 4n < 4\pi \Rightarrow \frac{3\pi}{4} < n < \pi$

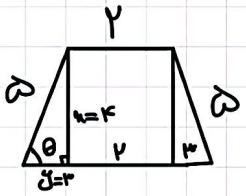
$\frac{1}{\sin^3 n + \cos^3 n} = \frac{1}{(\sin n+\cos n)(\sin^2 n+\cos^2 n - \sin n\cos n)} = -\frac{1}{\frac{4\sqrt{3}}{9}} = \frac{9}{4\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{-9\sqrt{3}}{12} = \frac{-3\sqrt{3}}{4}$

($\sin n+\cos n = -\frac{\sqrt{3}}{3}$ منفی، $\sin^2 n+\cos^2 n = 1$، $-(-\frac{1}{3}) = \frac{1}{3}$)

$(\sin n+\cos n)^2 = \sin^2 n+\cos^2 n+2\sin n\cos n \Rightarrow \sin n+\cos n = \ominus\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

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

۴-



$S = \frac{1}{2} \times (2+8) \times 4 = 20$

$\cos\theta = \frac{y}{5} = 0.6 \Rightarrow y = 3, n = 4$

۵-

$18^\circ = \alpha$ $\quad 18\alpha = 180 + 18$

$\rightarrow 17\alpha = -180 + 18\alpha$

$169\alpha = 169\alpha + 18\alpha$

$152\alpha = 170 - 18\alpha$

$\tan(\frac{3\pi}{2}+\alpha)\tan(-\pi+\alpha) - \sin(7\pi+\alpha)\cos(\frac{3\pi}{2}-\alpha) =$

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

($-\cot\alpha\tan\alpha = -1$، $\sin\alpha(-\sin\alpha) = -\sin^2\alpha$)

$\Rightarrow k = -1$

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$\alpha = 27^\circ$

$\sqrt{3}\cos(210^\circ)\sin(243^\circ) - \sqrt{2}\sin(135^\circ)\cos(153^\circ) = -\frac{3}{2}\sin\left(\frac{3\pi}{2}-\alpha\right) - \cos(\pi-\alpha) =$

$\cos(210^\circ) = -\frac{\sqrt{3}}{2}$, $\sqrt{3}\cos(210^\circ) = -\frac{3}{2}$; $\sin(135^\circ) = \frac{\sqrt{2}}{2}$, $\sqrt{2}\sin(135^\circ) = -1$

$-\frac{3}{2}(-\cos\alpha) + \cos\alpha = \frac{3}{2}\cos\alpha + \cos\alpha = \frac{5}{2}\cos\alpha \Rightarrow \frac{5}{2}$ برابر

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$\cos\frac{\pi}{12} = \cos 15^\circ = \cos45^\circ\cos30^\circ + \sin30^\circ\sin45^\circ = \frac{\sqrt{2}}{2}\times\frac{\sqrt{3}}{2} + \frac{1}{2}\times\frac{\sqrt{2}}{2} = \frac{\sqrt{6}+\sqrt{2}}{4} = \sqrt{\frac{2+\sqrt{3}}{4}}$

$\frac{2+\sqrt{3}}{4}$

$f\left(\frac{\pi}{36}\right) = 16\cos^2\left(\frac{3\pi}{36}\right)\cos^2\left(\frac{6\pi}{36}\right)\cos^2\left(\frac{12\pi}{36}\right)\cos^2\left(\frac{24\pi}{36}\right) = 16\cos^2\left(\frac{\pi}{12}\right)\underbrace{\cos^2\left(\frac{\pi}{6}\right)}_{\frac{3}{4}}\underbrace{\cos^2\left(\frac{\pi}{3}\right)}_{\frac{1}{4}}\underbrace{\cos^2\left(\frac{2\pi}{3}\right)}_{\frac{1}{4}} =$

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

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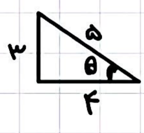
$1-\sin\alpha = 4 + 4\sin\alpha \Rightarrow 5\sin\theta = -3 \Rightarrow \sin\theta = -\frac{3}{5}$



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

$\tan\frac{\alpha}{2} = \frac{\sin\theta}{1+\cos\theta} = \frac{-\frac{3}{5}}{\frac{1}{5}} = -3$

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$\frac{1-\cos\theta}{\sin\theta} = \frac{\sin\theta}{1+\cos\theta} = \tan\frac{\theta}{2}$ می‌دانیم $\Rightarrow \frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = \cot\frac{\theta}{2} + \cot\frac{\theta}{2} = 2\cot\frac{\theta}{2} \Rightarrow K = 2$

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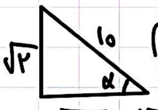

$\sqrt{98} = 7\sqrt{2}$

(ناحیه ۲ $\Rightarrow \cos\theta = -\frac{7\sqrt{2}}{10}$

$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\frac{11\pi}{4}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha = -\frac{\sqrt{2}}{2}\times\frac{-7\sqrt{2}}{10} - \frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10} =$

$\cos\frac{11\pi}{4} = \cos\left(2\pi+\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

$\frac{7}{10} - \frac{1}{10} = 0{,}6$