سارا ساسانی یازدهم دختر A تکلیف شماره ۲۸

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

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

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

ناحیه اول

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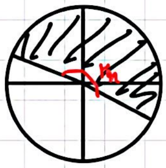
$$-\frac{\pi}{12} < x < \frac{5\pi}{12} \Rightarrow -\frac{2\pi}{12} < 2x < \frac{10\pi}{12} \Rightarrow -\frac{\pi}{6} < 2x < \frac{5\pi}{6}$$



$$-\frac{1}{2} < \sin 2x \leq 1 \Rightarrow -\frac{1}{2} < \frac{m-1}{4} \leq 1 \Rightarrow -2 < m-1 \leq 4 \Rightarrow -1 < m \leq 5$$

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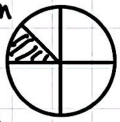
$$\tan x + \cot x = -3 \Rightarrow \frac{1}{\sin x\cos x} = -3 \Rightarrow \sin x\cos x = -\frac{1}{3}$$

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



$$\frac{1}{\sin^3 x + \cos^3 x} = \frac{1}{\underbrace{(\sin x+\cos x)}_{-\frac{\sqrt3}{3}}\underbrace{(\underbrace{\sin^2 x+\cos^2 x}_{1} \underbrace{- \sin x\cos x}_{-(-\frac13)=\frac13})}_{\frac43}} = -\frac{1}{\frac{4\sqrt3}{9}} = -\frac{9}{4\sqrt3}\times\frac{\sqrt3}{\sqrt3} = -\frac{9\sqrt3}{12} = -\frac{3\sqrt3}{4}$$

$$(\sin x+\cos x)^2 = \underbrace{\sin^2 x+\cos^2 x}_{1} + \underbrace{2\sin x\cos x}_{-\frac23} \Rightarrow \sin x+\cos x = \pm\frac{1}{\sqrt3} = -\frac{\sqrt3}{3}$$

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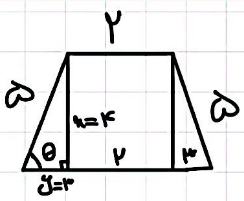

$$S = \frac{1}{2}\times(2+8)\times 4 = 20$$

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

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$15^\circ = \alpha$

$285 = 270+15$

$-165 = -180+15$

$1095 = 1080+15$

$255 = 270-15$

$$\tan\left(\frac{3\pi}{2}+\alpha\right)\tan(-\pi+\alpha) - \sin(6\pi+\alpha)\cos\left(\frac{3\pi}{2}-\alpha\right) =$$

$$\underbrace{(-\cot\alpha)(\tan\alpha)}_{-1} - \underbrace{(\sin\alpha)(-\sin\alpha)}_{-\sin^2\alpha} = -1-(-\sin^2\alpha) = -1+\sin^2\alpha = -\cos^2\alpha$$

$$\Rightarrow k = -1$$

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$\alpha = 27^\circ$

$\underbrace{\sqrt{3}\underbrace{\cos(210^\circ)}_{-\frac{\sqrt{3}}{2}}}_{-\frac{3}{2}} \sin(2430^\circ) - \underbrace{\sqrt{2}\underbrace{\sin(135^\circ)}_{\frac{\sqrt{2}}{2}}}_{-1} \cos(1530^\circ) = -\frac{3}{2}\sin\left(\frac{3\pi}{2}-\alpha\right) - \cos(\pi-\alpha) =$

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

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$\cos\frac{\pi}{12} = \cos 15^\circ = \cos 45^\circ \cos 30^\circ + \sin 30^\circ \sin 45^\circ = \frac{\sqrt{2}}{2}\times\frac{\sqrt{3}}{2} + \frac{1}{2}\times\frac{\sqrt{2}}{2} = \underbrace{\frac{\sqrt{6}+\sqrt{2}}{4}}_{\frac{2+\sqrt{3}}{4}} = \sqrt{\frac{2+\sqrt{3}}{4}}$

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

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

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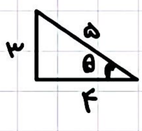
$1-\sin\theta = 4+4\sin\theta \Rightarrow 5\sin\theta = -3 \Rightarrow \sin\theta = -\frac{3}{5}$



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

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

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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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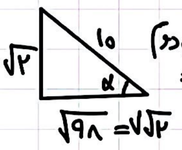

(ناحیه ۲) $\Rightarrow \cos\theta = -\frac{7\sqrt{2}}{10}$

$\cos\left(\frac{11\pi}{4}+\alpha\right) = \underbrace{\cos\frac{11\pi}{4}}_{\cos\left(2\pi+\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}}\cos\alpha - \sin\frac{11\pi}{4}\sin\alpha = -\frac{\sqrt{2}}{2}\times\frac{-7\sqrt{2}}{10} - \frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10} =$

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