آراد نیک مالی یازدهم سیر A

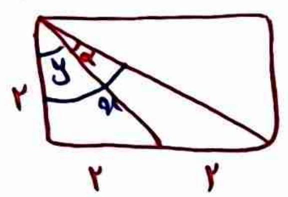
1

$S=\frac{1}{2}ab\sin\alpha$

$4{,}5=\frac{1}{2}\times\sqrt{3}\times 6\times\sin\alpha$

$\to \sin\alpha=\frac{\sqrt{3}}{2} \to \alpha=60$ ، $\alpha=120$ ۲ برابر

2



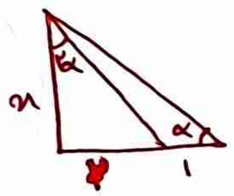
$\alpha=x-y$

$\tan x=\frac{4}{2}=2$

$\tan y=\frac{2}{2}=1$

$\tan(x-y)=\frac{2-1}{1+2(1)}=\frac{1}{3} \Rightarrow \underline{\cot\alpha=3}$

3



$\cot\alpha=\frac{3}{x}$

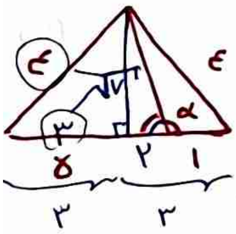
$\tan\alpha=\frac{x}{3}$

$\tan 2\alpha=\frac{2}{x}=\frac{2\tan\alpha}{1-\tan^2\alpha}=\frac{\frac{2x}{3}}{\frac{9}{9}-\frac{x^2}{9}}=\frac{6x}{-x^2+9}=\frac{2}{x} \Rightarrow 6x^2=-2x^2+18$

$x^2=\frac{18}{8}=\left(\frac{3}{2}\right)^2$

$\to x=\frac{3}{2} \quad \cot\alpha=\frac{3}{x}=\frac{3}{\frac{3}{2}}=2$

4



$|\tan(\pi-\alpha)|=|\tan\alpha|=\frac{\sqrt{7}}{2}$

$\alpha \to$ منفرجه ناحیه دوم $\Rightarrow \boxed{\tan\alpha=\frac{-\sqrt{7}}{2}}$

5

$\sin^2x+\underbrace{\sin^2x+\cos^2x}_{1}=\frac{4}{3} \Rightarrow \sin^2x=\frac{1}{3} \rightsquigarrow \cos^2x=1-\sin^2\alpha=\frac{2}{3}$

$1+\tan^2\alpha=\frac{1}{\cancel{\cos^2\alpha}}\ \frac{3}{2} \to \boxed{\tan^2\alpha=\frac{1}{2}}$

6

$\boxed{\sin^2+\cos^2=1}$

$\underbrace{\frac{(1-\cos^2\alpha)^2+4\cos^2\alpha}{1+\cos^2\alpha}=\frac{\overbrace{\cos^4\alpha-2\cos^2\alpha+4\cos^2\alpha+1}^{(1+\cos^2\alpha)^2}}{1+\cos^2\alpha}}_{1+\cos^2\alpha}$

$\underbrace{\frac{(1-\sin^2\alpha)^2+4\sin^2\alpha}{1+\sin^2\alpha}=\frac{\overbrace{\sin^4\alpha-2\sin^2\alpha+4\sin^2\alpha+1}^{(1+\sin^2\alpha)^2}}{1+\sin^2\alpha}}_{1+\sin^2\alpha}$

$(1+\cos^2\alpha)-(1+\sin^2\alpha)=\boxed{\cos 2\alpha}$

(7)

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

$(\cos\alpha)(-)(\sin\alpha)+\cot\alpha$

$-\sin\alpha\cos\alpha+\cot\alpha \rightarrow \cot\alpha-\frac{1}{\tan\alpha+\cot\alpha}=\frac{3}{4}-\frac{1}{\frac{4}{3}+\frac{3}{4}}=\frac{3}{4}-\frac{12}{25}=\frac{75}{100}-\frac{48}{100}=\frac{27}{100}$

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(8)

$3\cos 4x+\sqrt{2}\sin x-\sqrt{2}\cos x \rightarrow 3\cos\left(4\times\frac{\pi}{12}\right)+\cancel{\sqrt{2}(\sin x-\cos x)}$

$\sqrt{2}\left(\sqrt{2}\sin\left(x-\frac{\pi}{4}\right)\right)$

$\Rightarrow 3\cos\frac{\pi}{3}+2\sin\left(\frac{\pi}{12}-\frac{\pi}{4}\right)=3\times\frac{1}{2}+2\left(-\frac{1}{2}\right)=\frac{1}{2}$

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(9)

$\tan 2\alpha=\frac{2\tan\alpha}{1-\tan^2\alpha} \qquad \tan\alpha=\frac{2\left(\frac{1}{4}\right)}{1-\frac{1}{16}}=\frac{\frac{1}{2}}{\frac{15}{16}}=\frac{8}{15} \rightarrow \cot\alpha=\frac{8}{15},\ \sin^2\alpha=\frac{1}{1+\cot^2\alpha} \Rightarrow \sin\alpha=\frac{8}{17}$

$\cos\alpha=\frac{15}{17}$

$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{\frac{136-120}{\cancel{255}15}}{\frac{-7}{\cancel{17}}}=-\frac{16}{105}$

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(10)

$2\sin\alpha-\underset{2\sin\alpha\cos\alpha}{\cancel{\sin 2\alpha}}<0$

$2\sin\alpha\underbrace{(1-\cos\alpha)}_{+}<0 \Rightarrow \sin\alpha<0$

$\frac{\cot\alpha}{\underset{-}{\sin\alpha}}>0 \Rightarrow \cot\alpha<0\quad \sin\alpha<0 \rightarrow$ ربع چهارم