آراد نیک مالکی یازدهم سیر A

۲۰

①

(۲)

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

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

$\rightarrow \sin\alpha = \frac{\sqrt{3}}{2} \rightarrow \alpha = 60$, $\alpha = 120$

۲ بار ✓

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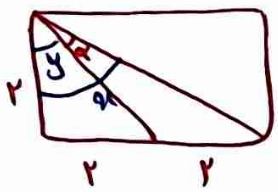
②

(۲)



$\alpha = x - y$

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

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

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

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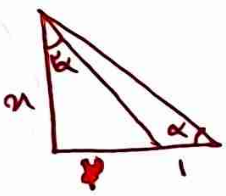
③

(۲)



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

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

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

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

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

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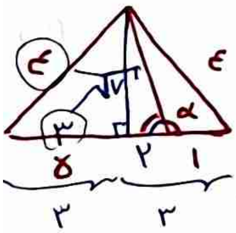
④

(۲)



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

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

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⑤

(۲)

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

$1 + \tan^2\alpha = \frac{1}{\cos^2\alpha} = \frac{3}{2} \rightarrow \tan^2\alpha = \frac{1}{2}$ ✓

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⑥

(۲)

$\sin^2 + \cos^2 = 1$

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

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

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

(۷) (۲)

$\sin\left(\frac{\varepsilon\pi}{۲}+\frac{\pi}{۲}+\alpha\right)\cos\left(۲\pi+\frac{۳\pi}{۲}-\alpha\right)-\tan\left(\frac{۳\pi}{۲}+\alpha\right)$

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

$-\sin\alpha\cos\alpha+\cot\alpha \rightarrow \cot\alpha-\frac{۱}{\tan\alpha+\cot\alpha}=\frac{۳}{\varepsilon}-\frac{۱}{\frac{\varepsilon}{۳}+\frac{۳}{\varepsilon}}=\frac{۳}{\varepsilon}-\frac{۱۲}{۲۵}=\frac{۷۵}{۱۰۰}-\frac{۶۸}{۱۰۰}=\frac{۲۷}{۱۰۰}$ ✓

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(۸) (۲)

$۳\cos\varepsilon x+\sqrt{۲}\sin x-\sqrt{۲}\cos x \rightarrow ۳\cos\left(\varepsilon\times\frac{\pi}{۱۲}\right)+\sqrt{۲}(\sin x-\cos x)$

$\sqrt{۲}\left(\sqrt{۲}\sin\left(x-\frac{\pi}{\varepsilon}\right)\right)$

$\Rightarrow ۳\cos\frac{\pi}{۲}+۲\sin\left(\frac{۳\pi}{۱۲}-\frac{۳\pi}{\varepsilon}\right)=\varepsilon\times\frac{۱}{۲}+۲\left(-\frac{۱}{۲}\right)=\frac{۱}{۲}$ ✓

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(۹) (۲)

$\tan۲\alpha=\frac{۲\tan\alpha}{۱-\tan^{۲}\alpha}$ $\quad \tan\alpha=\frac{۲\left(\frac{۱}{۲}\right)}{۱-\frac{۱}{۱۶}}=\frac{۱}{۲}\times\frac{۱۶}{۱۵}=\frac{۸}{۱۵} \rightarrow \cot\alpha=\frac{۸}{۱۵}$, $\sin^{۲}\alpha=\frac{۱}{۱+\cot^{۲}\alpha} \Rightarrow \sin\alpha=\frac{۸}{۱۷}$

$\cos\alpha=\frac{۱۵}{۱۷}$

$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=\frac{\frac{۸}{۱۵}-\frac{۸}{۱۷}}{\frac{۸}{۱۷}-\frac{۱۵}{۱۷}}=\frac{\frac{۱۳۶-۱۲۰}{۲۵۵}}{\frac{-۷}{۱۷}}=-\frac{۱۶}{۱۰۵}$ ✓

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(۱۰) (۲)

$۲\sin\alpha-\underbrace{\sin۲\alpha}_{۲\sin\alpha\cos\alpha}<۰$

$۲\sin\alpha(\underbrace{۱-\cos\alpha}_{+})<۰ \Rightarrow \sin\alpha<۰$

$\frac{\cot\alpha}{\sin\alpha}>۰ \Rightarrow \cot\alpha<۰ \quad \sin\alpha<۰ \rightarrow$ چهارم