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مهدی کاظمی اوده پیر B

① (۲)

$\frac{1}{2}\times 6\times\sqrt{3}\times \sin(?) = \frac{9}{2}$

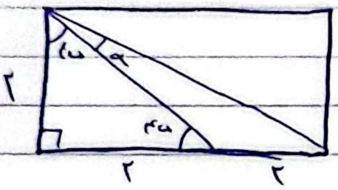
$\sin\alpha = \frac{\sqrt{3}}{2}$

$\alpha = 60$

$\alpha = 120$

$\frac{120}{60} \rightarrow (2)$ ✓

② (۲)



$\cot(\alpha+45) = \frac{2}{4} = \frac{1}{2}$

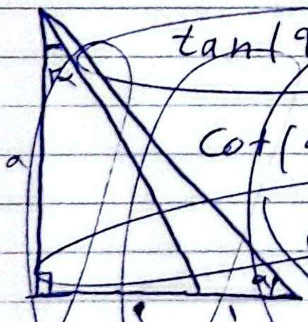
$\cot(\alpha+45) = \frac{1-\tan\alpha}{1+\tan\alpha} = \frac{1}{2}$

$2-2\tan\alpha = 1+\tan\alpha \longrightarrow 3\tan\alpha = 1$

$\tan\alpha = \frac{1}{3}$

$\cot\alpha = 3$ ✓

③



$\tan(90-\alpha) = \frac{3}{a}$ $\quad \frac{\tan\alpha}{\cot\alpha} = \frac{\tan\alpha}{\frac{1}{\tan\alpha}} = \frac{\frac{a}{3}}{\frac{a}{3}} = \frac{?}{3}$

$\cot(90-\alpha) = \frac{a}{3}$

$\cot(2\alpha) = \frac{a}{3}$ $\quad \tan\alpha\left(\frac{2\tan\alpha}{1-\tan^2\alpha}\right) = \frac{2}{3}$

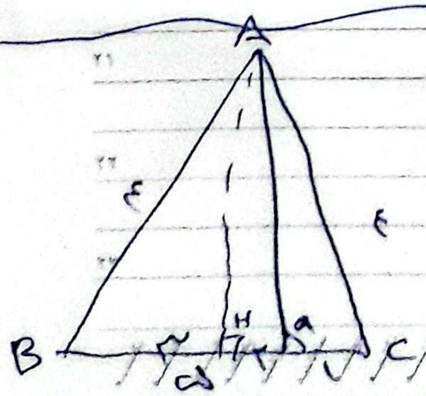
$\cot(90-\alpha) = \tan\alpha$ $\quad 6\tan^2\alpha = 2-2\tan^2\alpha$

$8\tan^2\alpha = 2$

غلط $\leftarrow \cot\alpha > 0$

$\tan^2\alpha = \frac{1}{4}$

④ (۲)



$AH^2 = 4^2 - 3^2 \longrightarrow AH = \sqrt{7}$

$-\tan\alpha = \frac{\sqrt{7}}{2} \longrightarrow \tan\alpha = \frac{-\sqrt{7}}{2}$ ✓

⑤ (۲)

$2\sin^2 x + \cos^2 x = \frac{4}{3}$ $\qquad \tan^2 x = ?$

$\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{2} = \frac{4}{3}$

$1 + \cot^2 x = \frac{1}{\sin^2 x} \longrightarrow 1 + \cot^2 x = 3 \longrightarrow \cot^2 x = 2$

$\tan^2 x = \boxed{\frac{1}{4}}$ ✓

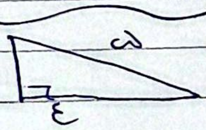
⑥ (۲)

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

دقت!

$\frac{(2-\sin^2\alpha)^2}{2-\sin^2\alpha} - \frac{(2-\cos^2\alpha)^2}{2-\cos^2\alpha} = \cos^2\alpha - \sin^2\alpha = \boxed{\cos 2\alpha}$ ✓

⑦ (۲)

$\tan\alpha = \frac{4}{3}$  $\longrightarrow \sin\alpha = -\frac{4}{5} \qquad \cos\alpha = -\frac{3}{5}$

$\cot\alpha = \frac{3}{4}$

$\sin\left(\frac{9\pi}{2} + \alpha\right) = +\cos\alpha$

$\cos\left(\frac{7\pi}{2} - \alpha\right) = -\sin\alpha$

$\tan\left(\alpha - \frac{3\pi}{2}\right) = -\cot\alpha$

$\longrightarrow = \cos\alpha \times \sin\alpha - (-\cot\alpha) =$

$= \left(-\frac{3}{5} \times -\frac{4}{5}\right) + \frac{3}{4} =$

$\frac{12}{25} + \frac{3}{4} = \boxed{0.27}$ ✓

⑧ (۲)

$(3\cos 4x + \sqrt{2}\sin x - \sqrt{2}\cos x)$

$x = \frac{\pi}{12}$

$\frac{\pi}{12} = 15 \longrightarrow \sin 15 = \sin(45 - 30) = \frac{\sqrt{6} - \sqrt{2}}{4}$ $\qquad \boxed{\frac{1}{24}}$ ✓

$\cos 15 = \cos(45 + 30) = \frac{\sqrt{6} + \sqrt{2}}{4}$

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۹) ۲

$\tan\left(\frac{\alpha}{2}\right)=\frac{1}{4}$

$\sin\alpha=\frac{2\tan\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}}=\frac{8}{17}$

$\cos\alpha=\frac{1-\tan^2\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}}=\frac{15}{17}$

$\tan\alpha=\frac{\sin\alpha}{\cos\alpha}=\frac{8}{15}$

$\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{\frac{16}{255}}{\frac{-7}{17}}=\frac{-16}{105}$ ✓

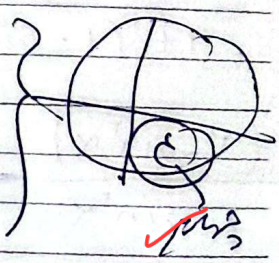
۱۰) ۲

$\frac{\frac{\cos\alpha}{\sin\alpha}}{\sin\alpha}=\frac{\cos\alpha}{\sin^2\alpha}>0\longrightarrow\cos\alpha>0$

$2\sin\alpha<\sin 2\alpha\longrightarrow\sin\alpha(1-\cos\alpha)<0$

$1-\cos\alpha>0$ (+)

$\sin\alpha<0$



۱۱) ۳

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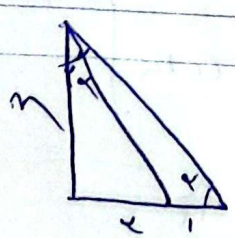
$\tan 2\alpha=\frac{2}{n}$

$\tan\alpha=\frac{n}{2}$

$\frac{2}{n}=\frac{2\left(\frac{n}{2}\right)}{1-\frac{n^2}{4}}\longrightarrow n=\frac{3}{2}\longrightarrow\tan\alpha=\frac{1}{2}$

$\cot\alpha=2$ ✓



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