نام و نام خانوادگی علیرضا جهانبخت ...... پاسخنامه تشریحی تکلیف شماره ۲۷ ...... کلاس یازدهم ب A

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

$\alpha = 60^\circ$

$\alpha = 120^\circ$

$\frac{120^\circ}{60^\circ} = \boxed{2}$

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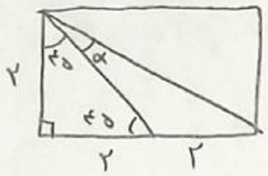

$\cot(\alpha + 45) = \frac{2}{4} = \frac{1}{2}$

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

$2 - 2\tan\alpha = 1 + \tan\alpha \rightarrow 3\tan\alpha = 1 \rightarrow \tan\alpha = \frac{1}{3}$

$\cot\alpha = 3$

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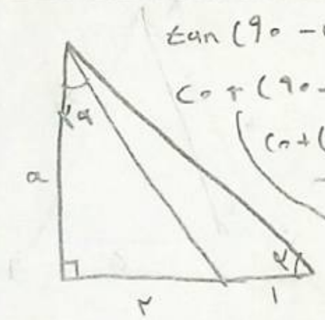

$\tan(90 - \alpha) = \frac{3}{a}$

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

$\cot(2\alpha) = \frac{a}{2}$

$\cot(90 - \alpha) = \tan\alpha$

$\frac{\tan\alpha}{\cot 2\alpha} = \frac{\tan\alpha}{\frac{1}{\tan 2\alpha}} = \frac{\frac{a}{3}}{\frac{a}{2}} = \frac{2}{3}$

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

$6\tan^2\alpha = 2 - 2\tan^2\alpha$

$8\tan^2\alpha = 2$

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

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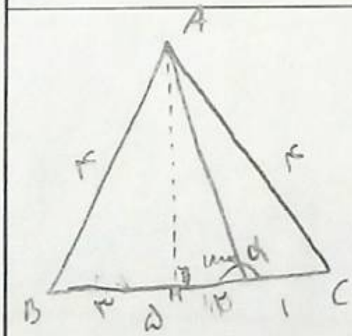

$AH^2 : 4^2 - 3^2 \Rightarrow AH = \sqrt{7}$

$\tan(180 - \alpha) = -\tan\alpha$

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

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$2\sin^2 x + \cos^2 x = \frac{4}{3} \rightarrow \sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{(1)} = \frac{4}{3} \rightarrow \sin^2 x = \frac{1}{3}$

$1 + \cot^2 x = \frac{1}{\sin^2 x} \rightarrow 1 + \cot^2 x = 3 \rightarrow \cot^2 x = 2 \rightarrow \tan^2 x = \boxed{\frac{1}{2}}$

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

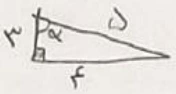
$\sin^2\alpha = 1-\cos^2\alpha \to \frac{\cos^4\alpha-4\cos^2\alpha+4}{1+\sin^2\alpha} = \frac{(\cos^2\alpha-2)^2}{2-\cos^2\alpha} = \frac{(\cos^2\alpha-2)^2}{-(\cos^2\alpha-2)} = -\cos^2\alpha+2$ ۶

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

$-1+4 = 3$

α ربع سوم

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



$\sim \sin\alpha = -\frac{4}{5} \quad \cos\alpha = -\frac{3}{5}$

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

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

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

$\to \sin(\frac{9\pi}{2}+\alpha)\cos(\frac{7\pi}{2}-\alpha) - \tan(\alpha-\frac{3\pi}{2}) =$ ۷

$\cos\alpha\cdot\sin\alpha - (-\cot\alpha) = -\frac{3}{5}\times-\frac{4}{5}+\frac{3}{4} =$

$\frac{12}{25}+\frac{3}{4} = \frac{48+75}{100} = \frac{123}{100} = 1.23$

$\left(3\cos\frac{4\pi}{12}+\sqrt{2}\sin\frac{\pi}{12}-\sqrt{2}\cos\frac{\pi}{12}\right) = 3(\frac{1}{2})+\sqrt{2}(\frac{\sqrt{6}-\sqrt{2}}{4})-\sqrt{2}(\frac{\sqrt{6}+\sqrt{2}}{4}) =$

$\frac{\pi}{12} = 15^\circ \to \sin 15 = \sin(45-30) = \frac{\sqrt{6}-\sqrt{2}}{4}$

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

$\frac{3}{2}+\frac{\sqrt{12}}{4}-\frac{1}{2}-\frac{\sqrt{12}}{4}-\frac{1}{2} = \frac{1}{2}$ ۸

$\sin\alpha = \frac{2\tan\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}} = \frac{2\times\frac{1}{4}}{1+\frac{1}{16}} = \frac{\frac{1}{2}}{\frac{17}{16}} = \frac{8}{17}$

$\cos\alpha = \frac{1-\tan^2\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}} = \frac{1-\frac{1}{16}}{1+\frac{1}{16}} = \frac{\frac{15}{16}}{\frac{17}{16}} = \frac{15}{17}$ ۹

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{8}{17}}{\frac{15}{17}} = \frac{8}{15}$

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

$-\frac{16}{15\times7} = -\frac{16}{105}$

$\frac{\cot\alpha}{\sin\alpha} > 0 \to \frac{\frac{\cos\alpha}{\sin\alpha}}{\frac{\sin\alpha}{1}} = \frac{\cos\alpha}{\sin^2\alpha} > 0 \xrightarrow{\sin^2\alpha>0} \cos\alpha>0$

$\sin2\alpha > 2\sin\alpha \to 2\sin\alpha\cos\alpha > 2\sin\alpha \sim \cos\alpha>0$ ۱۰

چون توانستیم $2\sin\alpha$ را از هر دو طرف بزنیم چون هر دو (+) هستند.

$\sin\alpha>0$, $\cos\alpha>0 \to$ ناحیه اول