نام و نام خانوادگی ...سبا فیضی... پاسخنامه تشریحی تکلیف شماره ۲۷... کلاس یازدهم دختران گروه B

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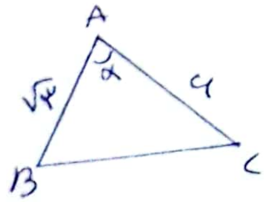

$S_\Delta = \frac{1}{2} AB \cdot \sin\alpha$

$= \frac{1}{2}(\sqrt{3})(6)(\sin\alpha) = 3\sqrt{3}\sin\alpha$

$3\sqrt{3}\sin\alpha = \frac{9}{2} \rightarrow \sin\alpha = \frac{9}{2\times 3\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{2} \Rightarrow \sin\alpha \rightarrow \xrightarrow{0<\alpha<180} \begin{cases} \alpha_1 = 60 \\ \alpha_2 = 120 \end{cases}$

$\Rightarrow \frac{\alpha_2}{\alpha_1} = 2$

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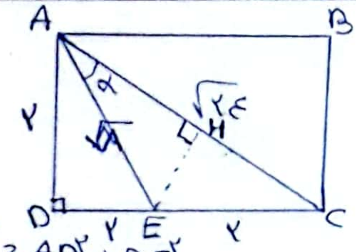

$AC^2 = DC^2 + AD^2$

$AC^2 = 16 + 8 = \sqrt{24}$

$\cot\alpha = ?$

$\downarrow$

$\frac{\cos\alpha}{\sin\alpha}$

$\tan(45+\alpha) = 2 = \frac{\tan\alpha + 1}{1 - \tan\alpha} \rightarrow \tan\alpha = \frac{1}{3}$

$\rightarrow \cot\alpha = 3$

$AE^2 = AD^2 + DE^2$

$\sqrt{8} = 4 + 4$

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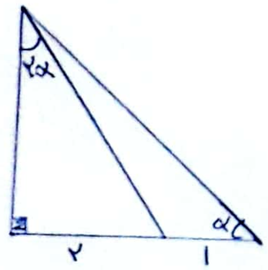

$\cot\alpha = ?$

$\tan B = \frac{AD}{AB} \rightarrow \tan 2\alpha = \frac{2}{x}$. $\tan C = \frac{AB}{AC} \rightarrow \tan\alpha = \frac{x}{3}$

$\rightarrow \tan 2\alpha \rightarrow \frac{2}{x} = \frac{2\times\frac{x}{3}}{1 - \frac{x^2}{9}} \rightarrow x = \frac{3}{2}$ $\tan\alpha = \frac{1}{2}$, $\cot\alpha = 2$

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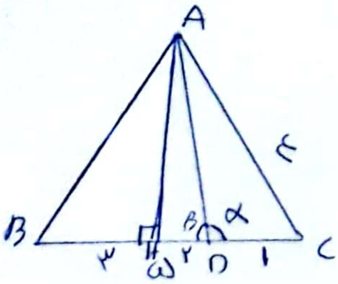

$\tan\alpha = ?$

$AC = AB = 4 \;,\; BC = 5 + 1 = 6$

$\tan\alpha = \tan(180 - \beta) = -\tan\beta = \frac{-AH}{HD}$

$AB^2 = AH^2 + BH^2 \Rightarrow 4^2 = AH^2 + 3^2 \Rightarrow AH = \sqrt{7}$

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

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

$2\tan^2 x + 1 = \frac{4}{3}\left(\frac{1}{\cos^2 x}\right) \xrightarrow{1+\tan^2 x = \frac{1}{\cos^2 x}} 2\tan^2 x + 1 = \frac{4}{3}(1 + \tan^2 x)$

$(2 - \frac{4}{3})\tan^2 x = \frac{4}{3} - 1 \Rightarrow \frac{2}{3}\tan^2 x = \frac{1}{3} \Rightarrow \tan^2 x = \frac{1}{2}$

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$$\frac{\sin^4\alpha+4\underbrace{\cos^2\alpha}_{\to\,1-\sin^2\alpha}}{1+\cos^2\alpha}-\frac{\cos^4\alpha+4\underbrace{\sin^2\alpha}_{\to\,1-\cos^2\alpha}}{1+\sin^2\alpha}=?$$

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

$$\frac{(\sin^2\alpha-2)^2}{2-\sin^2\alpha}-\frac{(\cos^2\alpha-2)^2}{2-\cos^2\alpha}=(2-\sin^2\alpha)-(2-\cos^2\alpha)=\cos^2\alpha-\sin^2\alpha=\cos2\alpha$$

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$$A=\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right)-\tan\left(\alpha-\frac{3\pi}{2}\right)=?$$

$\tan\alpha=\frac{4}{3}$ و α در ربع سوم

$\sin\left(\overset{4\pi}{\cancel{\frac{8\pi}{2}}}+\frac{\pi}{2}+\alpha\right)\Rightarrow\cos\alpha$

$\cos\left(\overset{4\pi}{\cancel{\frac{8\pi}{2}}}-\frac{\pi}{2}-\alpha\right)\Rightarrow\cos\left(\frac{\pi}{2}+\alpha\right)\Rightarrow-\sin\alpha$

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

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

cos ها و sin ها منفی ←

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

$-\left(-\frac{4}{5}\right)\times\left(-\frac{3}{5}\right)+\frac{1}{\frac{4}{3}}$

$\Rightarrow -0/48+0/75=0/27$

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$$\left(3\cos4x+\sqrt{2}\sin x-\sqrt{2}\cos x\right)\xrightarrow{x=\frac{\pi}{12}}?$$

$x=\frac{\pi}{12}=15^\circ$

$4x=4\times\frac{\pi}{12}=\frac{\pi}{3}$

$\cos\left(\frac{\pi}{3}\right)=\frac{1}{2}$

$\sin(15^\circ)=\frac{\sqrt{6}-\sqrt{2}}{4}$ و $\cos(15^\circ)=\frac{\sqrt{6}+\sqrt{2}}{4}$

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

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$$\frac{\tan\alpha-\sin\alpha}{\sin\alpha-\cos\alpha}=?$$

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

$\tan\alpha=\frac{2t}{1-t^2}$ ، $\sin\alpha=\frac{2t}{1+t^2}$ ، $\cos\alpha=\frac{1-t^2}{1+t^2}$ ⟸ جایگذاری $\frac{1}{4}$

$\Downarrow\ \frac{8}{15}$ ، $\frac{8}{17}$ ، $\frac{15}{17}$

$$\Rightarrow\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}}=\frac{-16}{105}$$

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$0<\frac{\cot\alpha}{\sin\alpha}$ ، $2\sin\alpha<\sin2\alpha$ — انتهای کمان α در کدام ربع؟

$\sin2\alpha \to 2\sin\alpha\cos\alpha$

$\Downarrow$

$0<\frac{\cos\alpha\to(+)}{\sin^2\alpha\to(+)}$

$\frac{2\sin\alpha}{2\sin\alpha}<\frac{2\sin\alpha\cos\alpha}{2\sin\alpha}\Rightarrow 1<\cos\alpha$ غ ق ق

که اگر $\sin\alpha$ منفی ← جهت نامساوی برمی‌گردد ← $1>\cos\alpha$

$\sin\alpha \to (-)$

در ربع چهارم!