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

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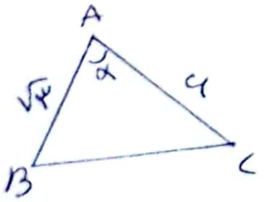

$S_\Delta = \frac{1}{2} AB \cdot \sin\alpha$

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

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

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

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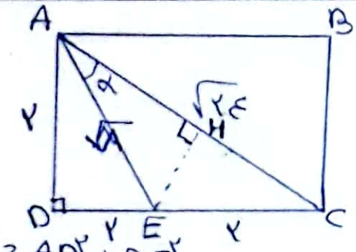

$AE^2 = AD^2 + DE^2$

$\sqrt{8} = 4 + 4$

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

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

$\cot\alpha = ?$

$\downarrow$

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

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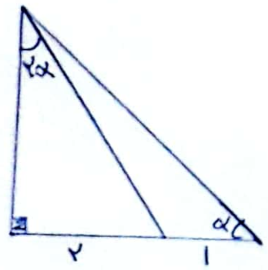
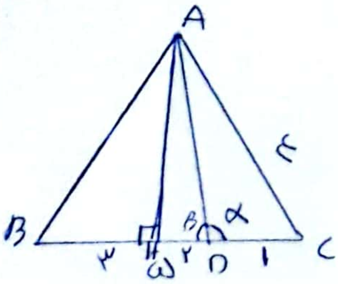


$\cot\alpha = ?$

۴



$\tan\alpha = ?$

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

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

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

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

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

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

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

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

($\cos^2\alpha \to 1-\sin^2\alpha$, $\sin^2\alpha \to 1-\cos^2\alpha$)

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

($\to (\sin^2\alpha-2)^2$, $\to (\cos^2\alpha-2)^2$)

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

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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

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

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

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

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

cos ها و sin ها منفی ←

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

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

$\Rightarrow -0.48 + 0.75 = \boxed{0.27}$

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

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

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

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

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

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

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

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

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

$\downarrow \frac{8}{15}$, $\downarrow \frac{8}{17}$, $\downarrow \frac{15}{17}$

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

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$0 < \frac{\cot\alpha}{\sin\alpha}$, $2\sin\alpha < \sin 2\alpha$

انتهای کمان α در کدام ربع؟

$\sin 2\alpha = 2\sin\alpha\cos\alpha$

α در ربع چهارم!

$\Downarrow$

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

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

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

$\sin\alpha \downarrow (-)$