نام و نام خانوادگی: دلارام میرزابابائیان — پاسخنامه تشریحی تکلیف شماره ۱۵ — کلاس: دوازدهم دختر B

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$y = \tan\left(-2x + \frac{\pi}{4}\right) \qquad S_{ABC}?$

$\tan\left(\frac{\pi}{4}\right) = 1 = h$

$T = \frac{\pi}{|-2|} = 0.5\pi$

$\boxed{\dfrac{1 \times \frac{\pi}{2}}{\frac{2}{1}} = \dfrac{\pi}{4}}$

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$x^2 - (\sin\alpha)x - \frac{1}{4}\cos^2\alpha = 0$

$\xrightarrow{x=\frac{2}{3}} \frac{4}{9} - \frac{2}{3}\sin\alpha - \frac{1}{4}(1-\sin^2\alpha) = 0$

$\frac{1}{4}\sin^2\alpha - \frac{2}{3}\sin\alpha + \frac{1}{3} = 0$

$\frac{1}{4}x^2 - \frac{2}{3}x + \frac{1}{3} = 0 \begin{cases} \to 2 \text{ غ ق ق} \\ \to \frac{2}{3} \checkmark = \sin\alpha \to \cos\alpha = \pm\frac{\sqrt{5}}{3} \end{cases}$

$1 - \tan^2\alpha = 1 - \dfrac{\frac{4}{9}}{\frac{5}{9}} = \boxed{\frac{1}{5}}$

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$\log(\sin\alpha) - \log(-\cos\alpha) = \log 3 \qquad \sin\alpha - \cos\alpha = \frac{3-(-1)}{\sqrt{10}} = \boxed{\frac{4}{\sqrt{10}}}$

$\underline{\sin\alpha > 0} \qquad -\cos\alpha > 0 \to \underline{\cos\alpha < 0}$

$\log(-\tan\alpha) = \log 3 \longrightarrow -\tan\alpha = 3 \to \tan\alpha = -3$

$1 + \tan^2\alpha = \frac{1}{\cos^2\alpha} \longrightarrow \cos\alpha = \underset{\text{غ ق}}{\cancel{\pm}}\,\frac{1}{\sqrt{10}} \ , \ \sin\alpha = +\frac{3}{\sqrt{10}}$

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$\sin^4 x + \cos^2 x = \frac{4}{5} \qquad \underbrace{\frac{\cos^4 x}{}}_{b^2} + \underbrace{\sin^2 x}_{a} = ?$

$\left.\begin{array}{l} \underset{\sin^2 x}{a^2} + \underset{\cos^2 x}{b} = \frac{4}{5} \\ a = 1 - b \\ \sin^2 x = 1 - \cos^2 x \end{array}\right\} \quad (1-b)^2 + b = \frac{4}{5} \to \underbrace{b^2 - b + 1}_{=} = \frac{4}{5}$

$b^2 + a = b^2 + (1-b) = b^2 - b + 1 = \boxed{\frac{4}{5}}$

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$\frac{3\sin x + \sin x\cos x}{2 - 2\cos^2 x} < 0 \ , \ \sin x\tan x - \frac{1}{\cos x} > 0$

$\dfrac{\sin(3+\cos x)}{2\underset{\sin^2 x}{\cancel{(1-\cos^2 x)}}} = \dfrac{\cancel{\sin x}\overset{\text{همواره } +}{(3+\cos x)}}{2\sin^{\cancel{2}} x} < 0 \to \sin x < 0$

$\sin x\tan x - \frac{1}{\cos x} = \dfrac{\overset{\text{همواره منفی } -}{\sin^2 - 1}}{\cos x} > 0 \longrightarrow \cos x < 0$

$\Big\}$ ربع سوم

$\frac{2}{\sin x} + \frac{3}{\cos x} = 0 \rightarrow \frac{2\cos x + 3\sin x}{\cos x \sin x} = 0 \qquad \tan + \cot = \frac{2}{\sin 2x} = ?$

غیرهم علامت هستند. ok

$\cos x = -\frac{3}{2}\sin x$

$\frac{9}{4}\sin^2 x + \sin^2 x = 1 \rightarrow \frac{13}{4}\sin^2 x = 1 \rightarrow \sin x = \pm\frac{2}{\sqrt{13}} \qquad \cos x = \mp\frac{3}{\sqrt{13}}$ ۶

$\sin 2x = 2 \times \frac{2}{\sqrt{13}} \times \frac{3}{\sqrt{13}} = -\frac{12}{13} \qquad \frac{2}{-\frac{12}{13}} = \boxed{-\frac{13}{6}}$

$\sqrt{1+\sin 50^\circ} \rightarrow 1+\cos 40 \rightarrow 2\cos^2 20$

$\underbrace{\sin 50^\circ}_{\sin(30+20)} + \underbrace{\sin 10^\circ}_{\sin(30-20)}$ ۷

$\frac{\sqrt{2}\,|\cos 20|}{\sin 30\cos 20 + \cos 30 \sin 20 + \sin 30 \cos 20 - \cos 30 \sin 20} = \frac{\sqrt{2}\,|\cos 20|}{2\underbrace{\cancel{\sin 30}}_{\frac{1}{2}}\cos 20} = \frac{\sqrt{2}\,|\cancel{\cos 20}|}{\cancel{\cos 20}} = \sqrt{2}$

$(1-2\sin^2 5^\circ)\,(2\cos^2 10^\circ - 1)\left(\frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ}\right)$

$\frac{1}{2}\sin 20 \qquad \frac{1}{2}\sin 40 \qquad \frac{1}{2}\sin 80$

$\frac{(\sin 10^\circ)\times(\cos 10^\circ)\,(\cos 20^\circ)\,(\cos 40^\circ)}{\sin 10^\circ} = \frac{\frac{1}{8}\sin 80^\circ}{\sin 10^\circ} = \boxed{\frac{1}{8}\cot 10^\circ}$ ۸

$\cos 10^\circ$

$\sin\alpha + 3\cos\alpha = 2 \qquad 5\cos 2\alpha - 12\cos\alpha\,?$

$\sin\alpha = 2 - 3\cos\alpha$

$\cos^2\alpha + \sin^2\alpha = 1 \rightarrow 4 - 12\cos\alpha + 9\cos^2\alpha + \cos^2\alpha = 1$

$10\cos^2\alpha - 12\cos\alpha + 3 = 0 \rightarrow \cos\alpha = \frac{3\pm\sqrt{6}}{5} \xrightarrow{\text{قق}} \frac{3-\sqrt{6}}{5}$ ۹

$5(2\cos^2\alpha - 1) - 12\cos\alpha \rightarrow 5\left(2\times\frac{(17-6\sqrt{6})-25}{25}\right) - 12\left(\frac{3-\sqrt{6}}{5}\right)$

$\sin B \cdot \sin C = \cos^2\frac{A}{2} \qquad \hat{B} = 72 \rightarrow (A+72^\circ) - 72^\circ$

$\sin 72 \cdot \frac{\sin(108-A)}{\sin(A+72)} = \frac{\cos A + 1}{2} \rightarrow 2\sin 72 \cdot \sin(A+72) = \cos(A+72)\cos 72 + \sin(A+72)\sin(72) + 1$

$*\sin(A+72) = a \qquad 2\sin 72 \cdot a = 1 + (b\cos 72 + a\sin 72) \rightarrow a\sin 72 = 1 + b\cos 72^\circ$ ۱۰

$\cos(A+72) = b \qquad \sin 72 = \frac{1+b\cos 72^\circ}{a}$

$\sin^2 72 + \cos^2 72 = 1 \xrightarrow{\times\sin^2 72} (1+b\cos 72)^2 + b^2\sin^2 72 = \sin^2 72 \rightarrow (b+\cos 72)^2 = 0 \qquad \boxed{a = 36^\circ}$

$* \rightarrow b = \cos(A+72^\circ) = \frac{-\cos 72^\circ}{-\cos 108} = \cos 108 \rightarrow A+72 = 108 \qquad b = -\cos 72^\circ$