۱) $AC = T \rightarrow \frac{\Gamma}{\Upsilon} = T \Rightarrow AC = \frac{\Gamma}{\Upsilon}$, $\xrightarrow{x=0} \tan\frac{\Gamma}{\epsilon} = 1$ ۲

$\Rightarrow B\Big|_{1}^{0} \Rightarrow S_{ABC}^{\Delta} = \frac{\Gamma}{\Upsilon} \times 1 \times \frac{1}{\Upsilon} = \boxed{\frac{\Gamma}{\epsilon}}$ ✓

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۲) $\xrightarrow{x=\frac{\Upsilon}{\Upsilon}} \frac{\Upsilon}{\Gamma} - \frac{\Upsilon}{\Upsilon}\sin x - \frac{1}{\epsilon} + \frac{1}{\epsilon}\sin^{\Upsilon} = 0$

$\rightarrow \frac{1}{\epsilon}\sin^{\Upsilon}x - \frac{\Upsilon}{\Upsilon}\sin x + \frac{1}{\Upsilon} = 0 \rightarrow \Upsilon\sin^{\Upsilon}x - \Lambda\sin x + \Upsilon = 0$

$\rightarrow x = \frac{\Lambda \pm \epsilon}{\Gamma} \begin{cases} \frac{1}{\epsilon} \times \\ \frac{1}{\Upsilon} \end{cases} \Rightarrow \sin x = \frac{1}{\Upsilon} \Rightarrow |\tan x| = \frac{1}{\Upsilon\sqrt{\Upsilon}}$

$\Rightarrow 1 + \tan^{\Upsilon}x = 1 + \frac{1}{\Lambda} = \boxed{\frac{\Gamma}{\Lambda}}$ ✓

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۳) $\log(\sin\alpha) - \log(-\cos\alpha) = \log\Upsilon \Rightarrow \tan\alpha = -\Upsilon$

$\Rightarrow \sin\alpha = -\Upsilon\cos\alpha \xrightarrow{\sin^{\Upsilon}+\cos^{\Upsilon}=1} \cos^{\Upsilon} = \frac{1}{1\Delta} \Rightarrow \sin^{\Upsilon} = \frac{\Gamma}{1\Delta}$ ۲

$\xrightarrow{\text{زاویه لقاء}} \begin{cases} \sin\alpha > 0 \\ \cos\alpha < 0 \end{cases} \Rightarrow \begin{cases} \sin\alpha = \frac{\Upsilon\sqrt{1\Delta}}{1\Delta} \\ \cos\alpha = -\frac{\sqrt{1\Delta}}{1\Delta} \end{cases} \Rightarrow \sin\alpha - \cos\alpha$

$= \frac{\epsilon\sqrt{1\Delta}}{1\Delta} = \boxed{\frac{\Upsilon\sqrt{1\Delta}}{\Delta}}$

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۴) $\sin^{\epsilon}\theta + \cos^{\Upsilon}\theta = \frac{\epsilon}{\Delta} \rightarrow \sin^{\epsilon}\theta + 1 - \sin^{\Upsilon}\theta = \frac{\epsilon}{\Delta} \rightarrow$

$\sin^{\Upsilon}(\sin^{\Upsilon} - 1) = -\frac{1}{\Delta} \rightarrow \sin^{\Upsilon}\cos^{\Upsilon} = \frac{1}{\Omega}$ ۲

$\cos^{\epsilon}\theta + \sin^{\Upsilon}\theta = \cos^{\Upsilon}(\cos^{\Upsilon}-1) + 1 = -\sin^{\Upsilon}\cos^{\Upsilon} + 1$

$= -\frac{1}{\Delta} + 1 = \boxed{\frac{\epsilon}{\Omega}}$ ✓

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۵) $\frac{\Upsilon\sin^{\Upsilon}x + \sin x\cos x}{\Gamma - \Gamma\cos^{\Upsilon}x} \rightarrow \sin x(\Upsilon + \underbrace{\cos x}_{>0}) < 0 \rightarrow \underbrace{\sin x < 0}$ ۲

$\Gamma - \Gamma\cos^{\Upsilon}x \rightarrow$ مخرج مثبت $= \Gamma\sin^{\Upsilon}x \Rightarrow$

$\frac{\sin^{\Upsilon}}{\cos^{\Upsilon}} > \frac{1}{\cos^{\Upsilon}} \rightarrow (\cos x > 0)$

ناحیه چهارم ۱۷۵

(۶ • $2\cos x + 3\sin x = 0 \Rightarrow 2\cos x = -3\sin x$ ①

$\Rightarrow \cos x = -\frac{3}{2}\sin x \xrightarrow{1=\sin^2+\cos^2} \cos^2 x = \frac{9}{13}$, $\sin^2 x = \frac{4}{13}$

• $\tan x + \cot x = \frac{2}{\sin 2x} \rightarrow \frac{1}{\sin x \cos x} = A$, ① $\Longrightarrow A < 0$

$\Rightarrow \frac{1}{\sin x \cdot \cos x} = -\frac{\sqrt{13}\cdot\sqrt{13}}{3\cdot 2} = \boxed{\frac{-13}{6}}$ ✓

(۷ $\frac{\sqrt{1+\sin 50}}{\sin 50 + \sin 10} = \frac{\sqrt{2}\cos 20}{\cos 40 + \sin 10} \rightarrow = \cos(30+10) + \sin 10 =$

$\frac{1}{2}(\sqrt{3}\cos 10 + 3\sin 10) = \frac{1}{2}(2\sqrt{3}\sin(10+60)) = \sqrt{3}\sin 70$ ①

$\Rightarrow \frac{\sqrt{2}\cos 20}{\sqrt{3}\sin 70} = \frac{\sqrt{2}}{\sqrt{3}}\frac{\cos 20}{\cos 20} = \boxed{\frac{\sqrt{6}}{3}}$

(۸ $(\cos 10)(\cos 40)(\cos 40) = \cos 10 \cdot \cos^2 40$ ①

$= \cos 10 \cdot \frac{1+\cos 80}{2} = \cos 10 \cdot \frac{1+\sin 10}{2} = \frac{\cos 10 + \cos 10 \sin 10}{2}$

(۹ • $\sin\alpha = 2 - 3\cos\alpha \xrightarrow{\sin^2+\cos^2=1} 4 + 9\cos^2\alpha - 12\cos\alpha + \cos^2\alpha = 1$

$10\cos^2\alpha - 12\cos\alpha + 3 = 0$

• $5\cos 2\alpha - 12\cos\alpha = 5(2\cos^2\alpha - 1) - 12\cos\alpha =$ ②

$10\cos^2\alpha - 12\cos\alpha - 5 + 3 - 3 = \boxed{-1}$ ✓

(۱۰ $\frac{\cos(B-C) - \cos(B+C)}{2} = \sin B \cdot \sin C$

$\cos(B-C) - \cos(B+C) = 2\sin^2\frac{A}{2} \xrightarrow{B+C=180-A}$ ②

$\frac{1+\cos A}{2} = \cos^2\frac{A}{2}$

$\cos(B-C) + \cos A = 1 + \cos A$

$\cos(B-C) = 1 \Rightarrow B - C = 0 \xrightarrow{B=75} C = 75 \Rightarrow \boxed{A = 30}$ ✓

۷

$\sqrt{1+\sin 50^\circ} = \sqrt{1+\cos 40^\circ} \xrightarrow[1+\cos 40^\circ = 2\cos^2 20^\circ]{\text{فرمول طلایی}} \sqrt{2\cos^2 20^\circ} = \sqrt{2}\,|\cos 20^\circ| = \sqrt{2}\cos 20^\circ$

$\sin 50^\circ + \sin 10^\circ = \sin(30^\circ+20^\circ) + \sin(30^\circ-20^\circ) =$

$\sin 30^\circ\cos 20^\circ + \sin 20^\circ\cos 30^\circ + \sin 30^\circ\cos 20^\circ - \sin 20^\circ\cos 30^\circ = 2\left(\frac{1}{2}\right)\cos 20^\circ = \cos 20^\circ$

$\frac{\sqrt{2}\cos 20^\circ}{\cos 20^\circ} = \boxed{\sqrt{2}}$

سوال ۸

$1-2\sin^2 5^\circ = \cos 10^\circ$

$2\cos^2 10^\circ - 1 = \cos 20^\circ$ } فرمول طلایی

$\cos(2\times 20^\circ) = \cos 40^\circ$

$\frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ} = \frac{\cos^2 20^\circ - \sin^2 20^\circ}{\underbrace{\cos^2 20^\circ + \sin^2 20^\circ}_{1}} = \cos 40^\circ$

$\frac{(\sin 10^\circ)\cos 10^\circ \times \cos 20^\circ \times \cos 40^\circ}{\sin 10^\circ} =$

$\frac{1}{2}\sin 20^\circ \times \cos 20^\circ \times \cos 40^\circ$

$\frac{1}{2}\times\frac{1}{2}\sin 40^\circ \times \cos 40^\circ =$

$\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}\sin 80^\circ = \frac{\frac{1}{8}\sin 80^\circ}{\sin 10^\circ} = \frac{1}{8}\cot 10^\circ$

($\sin 80^\circ \to \cot 10^\circ$)

۹

$\frac{(3+\cos x)\sin x}{2(1-\cos^2 x)} = \frac{(3+\cos x)\sin x}{2\sin^2 x} = \frac{3+\cos x}{2\sin x} < 0 \to \sin x < 0$

(همواره $\oplus$: $3+\cos x$)

$\frac{\sin x \times \sin x}{\cos x} - \frac{1}{\cos x} = \frac{-(1-\sin^2 x)}{\cos x} = \frac{-\cos^2 x}{\cos x} > 0 \to \cos x < 0$

انتهای کمان x در ناحیه سوم مثلثاتی است