بنام خدا

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$T = \frac{\pi}{2} = \overline{AC}$ $\quad f(0)=? \to \tan(\frac{\pi}{4}) = 1 = \overline{OB}$ ۱-

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

$\xrightarrow{x=\frac{2}{3}} \frac{4}{9} - \frac{2}{3}\sin\alpha = \frac{1}{4} - \frac{\sin^2\alpha}{4} \to 9\sin^2\alpha - 24\sin\alpha + 7 = 0$ ۲-

$(\sin\alpha - 21)(\sin\alpha - 3) = 0$ اوری

$1+\tan^2\alpha = \frac{1}{\cos^2\alpha} = \frac{1}{1-\sin^2\alpha} = \frac{1}{1-\frac{1}{9}} = \boxed{\frac{9}{8}}$ $\quad \sin\alpha \begin{cases} \frac{21}{9} & ✗ \\ \frac{3}{9} & ✓ \end{cases}$

$D: \quad \log(-\tan x) = \log 3 \to \tan\alpha = -3$ ۳-

$\xrightarrow[\cos\alpha<0]{\sin\alpha>0} (\sin\alpha-\cos\alpha)^2 = 1-\sin 2\alpha \xrightarrow{\sin 2\alpha = \frac{2\tan\alpha}{1+\tan^2\alpha}} |\sin\alpha - \cos\alpha| = \sqrt{1-\frac{-6}{1+9}}$

$\to |\sin\alpha-\cos\alpha| = \frac{2\sqrt{5}}{5}$ بزرگتر از صفر $\to \boxed{\sin\alpha - \cos\alpha = \frac{2\sqrt{5}}{5}}$

$\sin^4\alpha - \sin^2 + \frac{1}{5} = 0 \to \sin^2\alpha = t,\ 5t^2 - 5t + 1 = 0$ ۴-

$t\begin{cases} \frac{5-\sqrt{5}}{10} & ✓ \\ \frac{5+\sqrt{5}}{10} & ✓ \end{cases}$

$\to \begin{cases} \sin^2\alpha = \frac{5-\sqrt{5}}{10} \to \cos^2\alpha = \frac{5+\sqrt{5}}{10} \\ \cos^2\alpha = \frac{5-\sqrt{5}}{10} \to \sin^2\alpha = \frac{5+\sqrt{5}}{10} \to \end{cases}$

$A = \left(\frac{5-\sqrt{5}}{10}\right)^2 + \frac{5+\sqrt{5}}{10} = \frac{3-\sqrt{5}+5+\sqrt{5}}{10} = \boxed{0/8}$

$\frac{\sin\alpha(3+\cos\alpha)}{2\sin^2\alpha} < 0 \xrightarrow{2\sin^2\alpha>0} \sin\alpha(\overbrace{3+\cos\alpha}^{+}) > 0 \to \sin\alpha < 0$ ۵-

$2 < 3+\cos\alpha < 4$

$\to \frac{\sin^2\alpha}{\cos\alpha} - \frac{1}{\cos\alpha} = \frac{-\cos^2\alpha}{\cos\alpha} > 0 \to \frac{\overset{+}{\cos^2\alpha}}{\cos\alpha} < 0 \to \cos\alpha < 0$

ناحیه سوم مثلثاتی

$$\frac{2\cos x + 3\sin x}{\sin x \cos x} = 0 \longrightarrow \frac{-2}{3} = \tan x \longrightarrow \frac{-3}{2} = \cot x$$ — ۶

$$\tan x + \cot x = -\frac{2}{3} - \frac{3}{2} = \frac{-4-9}{6} = \boxed{\frac{-13}{6}}$$

$$\frac{\sqrt{1+\cos 40^\circ}}{\cos 40^\circ + \sin 10^\circ} = \frac{\sin 25^\circ + \cos 25^\circ}{\cos 20^\circ} = \frac{\sqrt{2}\,\sin(25+45)}{\cos 20} = \frac{\sqrt{2}\,\cancel{\sin 70}}{\cos 20}$$ — ۷

$$= \boxed{\sqrt{2}}$$

$\cos(60-20)$ $\quad$ $\sin(30-20)$

$\cos 60 \cos 20 + \sin 60 \sin 20$ $\quad$ $\sin 30 \cos 20 - \cos 30 \sin 20$

$\frac{1}{2}$ $\quad \frac{\sqrt{3}}{2}$ $\quad \frac{1}{2}$ $\quad \frac{\sqrt{3}}{2}$

$$\begin{cases} \frac{1+\cos 2\alpha}{2} = \cos^2\alpha \\ \frac{1-\cos 2\alpha}{2} = \sin^2\alpha \\ \frac{1-\tan^2\alpha}{1+\tan^2\alpha} = \cos 2\alpha \end{cases}$$

$$\longrightarrow \frac{\cancel{\sin 10}}{\cos 10} \times \cos 20 \times \cos 40 \times \frac{\sin 10 \times 8}{\sin 10 \times 8}$$ — ۸

$$\longrightarrow \frac{\sin 80}{\sin 10 \times 8} = \frac{\cos 10}{\sin 10 \times 8} = \boxed{\frac{1}{8}\cot 10^\circ}$$

$$A = 10\cos^2\alpha - 12\cos\alpha - 5 = ?$$

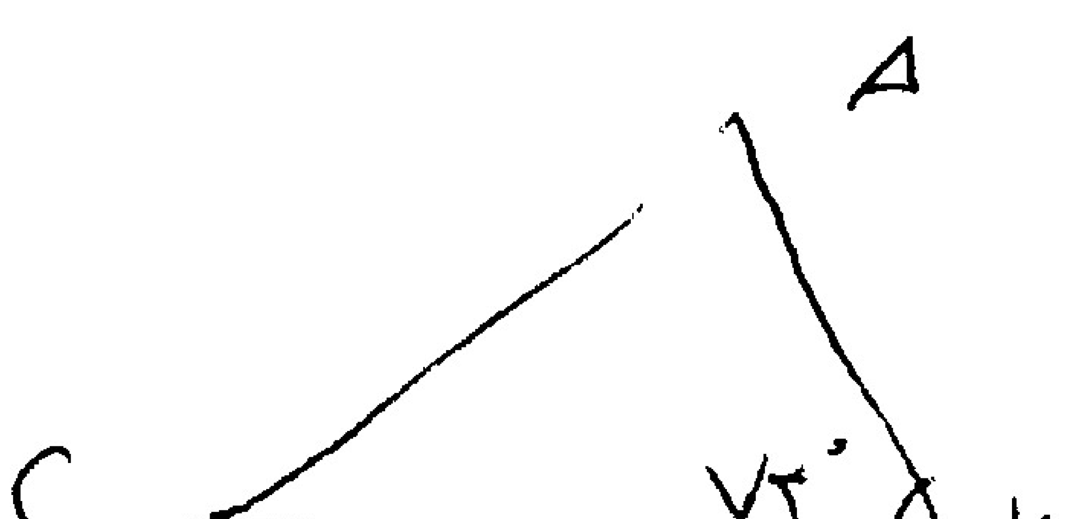
$$2 - 3\cos\alpha = \sin\alpha$$ — ۵

توان ۲

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

$$\longrightarrow 10\cos^2\alpha - 12\cos\alpha = -3$$

$$A = -3 - 5 = \boxed{-8}$$



$$\sin B \sin C = \frac{1+\cos A}{2} \longrightarrow 2\sin B \sin C = 1 + \cos A$$ — ۱۰