نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس ..... دسته A

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$T = \frac{\pi}{2}$ $\quad y = \tan(-2x + \frac{\pi}{4}) \xrightarrow{x=0} y = 1$

$AC = T = \frac{\pi}{2}$ $\quad S = \frac{1}{2} \times 1 \times \frac{\pi}{2} = \frac{\pi}{4}$ — ۱

۲ ✓

$x^2 - (\sin a)x - \frac{1}{4}\cos^2 a = 0 \rightarrow \frac{4}{9} - \frac{2}{3}\sin a - \frac{1}{4}\frac{\cos^2 a}{(1-\sin^2)} = 0$

$9\sin^2 a + 12\sin a - 7 = 0 \longrightarrow \sin a$ ↗ $-\frac{1}{3}$ قبول ↘ $-\frac{21}{9}$ قبول نیست

$\tan^2 + 1 = \frac{1}{8} + 1 = \frac{9}{8}$ — ۴

۲ ✓

$\log(\sin a) - \log(-\cos a) = \log 3 \longrightarrow \log\left(-\frac{\sin a}{\cos a}\right) = \log 3$

$\tan a = -3$ $\quad \sin a > 0$ $\quad \cos a < 0$ — ربع دوم

$\sin a - \cos a = \frac{3}{\sqrt{10}} + \frac{1}{\sqrt{10}} = \frac{4}{\sqrt{10}} = \frac{4\times\sqrt{10}}{10} = \frac{2\sqrt{10}}{8}$ — ۳

۲ ✓

$\sin^4\theta + \cos^2\theta = B = \frac{4}{8}$ $\quad \cos^4\theta + \sin^2\theta = A \longrightarrow A = \frac{4}{8}$

$A - B = \underbrace{\cos^4\theta - \sin^4\theta}_{(\cos^2\theta+\sin^2\theta)(\cos^2\theta-\sin^2\theta)} + \underbrace{\sin^2\theta - \cos^2\theta}_{-(\cos^2\theta-\sin^2\theta)} = \cos 2\theta - \cos 2\theta = 0$

$\cos^2\theta + \sin^2\theta = 1$ $\quad \cos^2\theta - \sin^2\theta = \cos 2\theta$ — ۴

$A = B = \frac{4}{8}$

۲ ✓

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

$\sin x \times \tan x - \frac{1}{\cos x} > 0 \longrightarrow \frac{\sin x \times \sin x}{\cos x} - \frac{1}{\cos x} \rightarrow \frac{\sin^2 x - 1}{\cos x} > 0$ — ۵

$-\cos^2 x$

$\cos x < 0$ ، $\sin x < 0$ — a در ربع سوم است

۲ ✓

$\tan x + \cot x = 2\csc 2x$

$\frac{2}{\sin x} + \frac{3}{\cos x} = 0$

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

$2\tan = -\frac{4}{3}$

$1+\tan^2 = 1+\frac{4}{9} = \frac{13}{9}$

$\sin 2x = \frac{2\tan x}{1+\tan^2 x} = -\frac{12}{13}$

$2\csc 2x = \frac{2}{\sin 2x}$

$= 2\times -\frac{13}{12} = -\frac{13}{6}$

۶

$\frac{\sqrt{1+\sin 70}}{\sin 50^\circ + \sin 10^\circ} = \frac{\sqrt{1+\cos 40^\circ}}{\cos 40^\circ + \cos 80^\circ} = \frac{\sqrt{2\cos 20^2}}{\cos 40^\circ + \cos 80^\circ}$

$\frac{\sqrt{2+\cos 20^\circ}}{2\cos\left(\frac{40+80}{2}\right)\cos\left(\frac{80-40}{2}\right)} = \frac{\sqrt{2+\cos 20^\circ}}{2\times\frac{1}{2}\times\cos 20^\circ} = \sqrt{2}$

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$(1-2\sin^2 70)(2\cos^2 10-1)\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)$

$= \cos 10^\circ \times \cos 20^\circ \times \cos 40^\circ \xrightarrow{\times \sin 10^\circ}$ $\sin 10^\circ \times \cos 10^\circ \times \cos 20^\circ \times \cos 40^\circ$

$\sin 10^\circ \times \cos 10^\circ = \frac{1}{2}\sin 20^\circ$

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

$\frac{1}{2}\sin 40^\circ \times \cos 40^\circ = \frac{1}{2}\sin 80^\circ = \frac{1}{2}\sin 80^\circ$

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

۸

$\sin a + 2\cos a = 2 \longrightarrow \sin = 2 - 2\cos \longrightarrow \sin^2 = 1-\cos^2$

$4 + 4\cos^2 - 8\cos = 1-\cos^2 \longrightarrow 5\cos^2 - 8\cos + 3 = 0 = B$

$3(\cos 2a) - 8\cos a = 3(2\cos^2 - 1) - 8\cos a = 6\cos^2 - 8\cos a - 3 = A$

$A = B - 1 \longrightarrow A = -1$

۹

$\sin\hat{B}\sin\hat{C} = \cos^2\frac{\hat{A}}{2} \longrightarrow \sin\hat{B}\sin\hat{C} = \frac{1+\cos\hat{A}}{2}$

$\sin\hat{B}\sin\hat{C} = \frac{1}{2}\left(\cos(B-C) - \underbrace{\cos(B+C)}_{B+C=\pi-A}\right) \longrightarrow \cos\hat{A}$

$\frac{1+\cos\hat{A}}{2} = \frac{\cos(B-C)+\cos\hat{A}}{2} \Rightarrow \cos(B-C) = 1 \longrightarrow B-C = 0$

$B = C = 72$ $\quad A = 180 - 144 = 36^\circ$

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