روژین نسیان

(1) $\overline{AC} =$ دوره تناوب $= \frac{\pi}{|۱-۳|} \rightarrow \frac{\pi}{۲}$ $\quad h = f(0) = y_B$

$\rightarrow f(0) = \tan\left(\frac{\pi}{۴}\right) = 1 \rightarrow \boxed{\frac{\pi}{۲} \times ۱ \times \frac{۱}{۲} = \frac{\pi}{۴}}$

Subject. Day. Month. Year.

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

$4x^2 - 4(\sin\alpha)x - (1-\sin^2\alpha) = 0$

$4x^2 - 4(\sin\alpha)x + \sin^2\alpha = 1 \Longrightarrow (2x - \sin\alpha)^2 = 1$

$2x - \sin\alpha = 1 \xrightarrow{x = 2/3} \frac{4}{3} - \sin\alpha = 1 \longrightarrow \frac{1}{3} = \sin\alpha$ ق ق $\longrightarrow$ 3, 1, $\sqrt{8}$

$2x - \sin\alpha = -1 \xrightarrow{x = 2/3} \frac{4}{3} - \sin\alpha = -1 \longrightarrow \frac{7}{3} = \sin\alpha$ غ ق ق

$1 + \tan^2\alpha = \frac{1}{\cos^2\alpha}$

$\longrightarrow \cos\alpha = \frac{\sqrt{8}}{3} \longrightarrow \cos^2\alpha = \frac{8}{9}$

$\longrightarrow \frac{1}{\frac{8}{9}} = \boxed{\frac{9}{8}}$

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③ $-\frac{\sin\alpha}{\cos\alpha} = 3 \qquad \frac{\sin\alpha}{\cos\alpha} = -3$ $\qquad$ $\sqrt{10}$, 3, 1

۲ حالت $\longrightarrow \sin\alpha < 0,\ \cos\alpha > 0 \qquad -\frac{3}{\sqrt{10}} + \frac{1}{\sqrt{10}} = -\frac{2}{\sqrt{10}}$

$\quad\longrightarrow \sin\alpha > 0 \quad \cos\alpha < 0 \qquad \frac{3}{\sqrt{10}} - \frac{1}{\sqrt{10}} = \frac{2}{\sqrt{10}}$

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④ $\sin^4\theta + \cos^2\theta = \frac{4}{5}$

$-\ \cos^4\theta + \sin^2\theta = n$

$(\sin^4\theta - \cos^4\theta) + (\cos^2\alpha - \sin^2\alpha) = \frac{4}{5} - n$

$(\sin^2\alpha - \cos^2\alpha)(\sin^2\alpha + \cos^2\alpha) + (\cos^2\alpha - \sin^2\alpha) = \frac{4}{5} - n$

$(\sin^2\alpha - \cos^2\alpha)(\underbrace{\cancel{\sin^2\alpha + \cos^2\alpha} - 1}_{0}) = \frac{4}{5} - n \Big\} \longrightarrow \boxed{n = \frac{4}{5}}$

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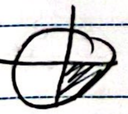
⑤ $\frac{3\sin x + \sin x\cos x}{2 - 2\cos^2 x} < 0 \longrightarrow 3\sin x + \sin x\cos x < 0$

همیشه مثبت

$\sin x(\underbrace{3 + \cos x}_{\text{همیشه مثبت}}) < 0 \longrightarrow \boxed{\sin x < 0}$

همیشه +

$\frac{\sin x^2}{\cos x} - \frac{1}{\cos x} > 0 \longrightarrow \frac{\sin^2 x - 1}{\cos x} > 0 \longrightarrow \frac{\cos^2 x}{\cos x} > 0 \longrightarrow \cos x > 0$

$\longrightarrow$  $\longrightarrow$ ربع چهارم.

۶) ؛

$$\frac{۲\cos x + ۳\sin x}{\sin x\cos x} = ۰ \xrightarrow[\cos x \neq ۰]{\sin x \neq ۰} ۲\cos x + ۳\sin x = ۰ \xrightarrow{\div \cos x} ۲ + ۳\tan x = ۰$$

$$\longrightarrow \tan x = -\frac{۲}{۳} \qquad -\frac{۲}{۳} - \frac{۳}{۲} = \frac{-۴-۹}{۶} = \frac{-۱۳}{۶}$$

۷) $$\frac{\sqrt{۱+\sin ۵۰}}{\sin ۵۰+\sin ۱۰}=\frac{\sqrt{(\sin ۲۵+\cos ۲۵)^{۲}}}{\sin ۵۰+\sin ۱۰}=\frac{|\sin ۲۵+\cos ۲۵|}{\sin ۵۰+\sin ۱۰}=\frac{\sqrt{۲}\,|\sin(۲۵+۴۵)|}{\sin ۵۰+\sin ۱۰}$$

$$\frac{\sqrt{۲}\sin ۷۰}{\sin(۳۰+۲۰)+\sin(۳۰-۲۰)}=\frac{\sqrt{۲}\sin ۷۰}{\sin ۳۰\cos ۲۰+\cancel{\sin ۲۰\cos ۳۰}+\sin ۳۰\cos ۲۰-\cancel{\sin ۲۰\cos ۳۰}}=\frac{\sqrt{۲}\sin ۷۰}{\underbrace{\cancel{۲\sin ۳۰}}_{۱}\cos ۲۰}$$

$$\frac{\sqrt{۲}\sin ۷۰}{\cos ۲۰}=\sqrt{۲}$$

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(8) $\dfrac{(1-\cancel{2\sin^2 5})(2\cos^2 10-1)\left(\dfrac{1-\tan^2 20}{1+\tan^2 20}\right)}{}$

$$\frac{\sin 10 \times (\cos 10)(\cos 20)(\cos 40)}{\sin 10} \longrightarrow \frac{\frac{1}{2}\sin 20 \cdot \cos 20 \cdot \cos 40}{\sin 10} \quad \frac{\frac{1}{4}\sin 40}{} \quad \frac{\frac{1}{4}\sin 80}{} = \frac{1}{8}\,\frac{\sin 80}{\sin 10}$$

$$\longrightarrow \frac{1}{8}\,\frac{\cos 10}{\sin 10} = \frac{1}{8}\tan 10$$

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(9) $\sin\alpha + 3\cos\alpha = 2 \qquad 5\cos 2\alpha - 12\cos\alpha = ? \qquad (\sin x + \cos x) = 2 - 2\cos x$

$\cos^2 x = \dfrac{1+\cos 2\theta}{2} \longrightarrow 2\cos^2 x - 1 = \cos 2\theta \qquad \sin x + 3\cos\alpha = 2$

$5(2\cos^2 x - 1) - 12\cos\alpha = 10\cos^2 x - 5 - 12\cos\alpha = 2$

$10\cos^2 x - 12\cos x - 7 = 0$

$70 \quad \frac{5}{14} \quad 10$

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(10) $\sin B \sin C = \cos^2\dfrac{A}{2} \qquad B = 72^\circ \qquad A+B+C=180$

$A = 180-(B+C)$

$\dfrac{A}{2} = 90 - \left(\dfrac{B+C}{2}\right)$

$\sin B \sin C = \cos^2\left(90 - \dfrac{(B+C)}{2}\right)$

$\sin B \sin C = \sin^2\left(\dfrac{B+C}{2}\right) \longrightarrow \sin 72 \sin C = \sin^2\left(36 + \dfrac{C}{2}\right)$

$\sin 72 \sin C = \sin\left(36 + \dfrac{C}{2}\right)\sin\left(36 + \dfrac{C}{2}\right) \longrightarrow$ اگر زاویه C را ۷۲ درجه قرار بدهیم طرفین برابرند

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