۱۷,۲۵

① $\overline{AC} =$ دوره تناوب $= \frac{\pi}{|1-3|} = \rightarrow \frac{\pi}{2}$ $\quad h = f(0) = y_B$ روزبه نوریان

$\longrightarrow f(0) = \tan\left(\frac{\pi}{4}\right) = 1 \longrightarrow \boxed{\frac{\pi}{2} \times 1 \times \frac{1}{2} = \frac{\pi}{4}}$

②

Subject. Day. Month. Year.

۲ $x^2 - (\sin\alpha)x - \frac{1}{4}\cos^2\alpha = 0 \xrightarrow{\times 4} 4x^2 - 4(\sin\alpha)x - \cos^2\alpha = 0$

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

$4x^2 - 4(\sin\alpha)x + \sin^2\alpha = 1 \Longrightarrow (2x - \sin\alpha)^2 = 1$ ۲ ✓

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

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

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

۳ $\frac{\sin\alpha}{\cos\alpha} = -3$ $\frac{\sin\alpha}{\cos\alpha} = -3$ ۱

$\sin\alpha > 0$
$\cos\alpha < 0$

$\sqrt{10}$, 3, 1, α

tg sin α
L.g (−cos α)

$\sin\alpha - \cos\alpha$

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

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

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

$\to \sin\alpha > 0 \quad \cos\alpha < 0$ $\frac{3}{\sqrt{10}} + \frac{1}{\sqrt{10}} = \frac{4}{\sqrt{10}}$

۴ $\sin^4\theta + \cos^2\theta = \frac{4}{5}$

$\cos^4\theta + \sin^2\theta = x$ ۲ ✓

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

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

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

۵ $\frac{3\sin x + \sin x\cos x}{2 - 2\cos^2 x} < 0 \to 3\sin x + \sin x\cos x < 0$

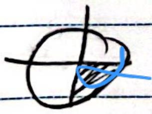
۲ ضعف
همیشه مثبت

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

همیشه +

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

$\cos\alpha < 0$

$\to$  $\to$ ربع سوم

ربع سوم

۱٫۵

(۶) ~~ت~~: $\dfrac{۲\cos x + ۳\sin x}{\sin x \cos x} = 0 \xrightarrow[\cos x \neq 0]{\sin x \neq 0} ۲\cos x + ۳\sin x = 0 \xrightarrow{\div \cos x} ۲ + ۳\tan x = 0$

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

(۲) ✓

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

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

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

۲ ✓

Subject. Day. Month. Year.

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

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

$\frac{1}{2}\sin 40$, $\frac{1}{4}\sin 80$

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

۱,۷۵ ✓

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

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

$5(2\cos^2 x - 1) - 12\cos\alpha = 10\cos^2 x + 5 - 12\cos\alpha = 2$ ۱

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

$10\left(\frac{1+\cos 2x}{2}\right) - 12\cos x + 3 = 0 \rightarrow 5\cos 2\alpha - 12\cos\alpha = -8$

(10) $\sin B \sin C = \cos^2\frac{A}{2}$ $\quad B = 72°$ $\quad A+B+C = 180$

$A = 180 - (B+C)$

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

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

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

$\to B = 72 \quad C = 72 \quad A = 180 - 144 = 36°$

۲ ✓