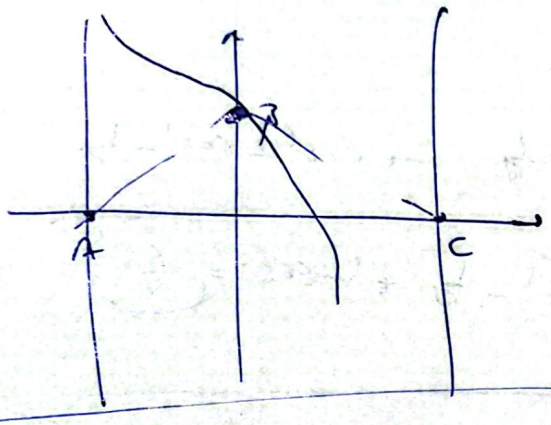
سوال ۱



ب

$\tan(\frac{\pi}{4}) = 1$

$\alpha = \frac{1}{2}\times\frac{\pi}{4} + \frac{\pi}{4}$

سوال ۲

ج

$\frac{9}{4} - \frac{3}{2}\sin\alpha - \frac{1}{4}(1-\sin^2)$

$\frac{\sin^2}{4} - \frac{3}{2}\sin\alpha + \frac{9}{4}$

$9\sin^2 - 12\sin + 9 = 0$

$\sin = \frac{12}{18} = \frac{2}{3}$

$\frac{12+6}{18} = \frac{12-6}{18} = \frac{1}{3}$

$\sin = \frac{1}{3}$

$\cos = \frac{\sqrt{8}}{3}$

$9\sin^2 - 12\sin + 9 = 0$

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

$\frac{9}{8}$

سوال ۳

$\log(\sin x) - \log(-\cos x) = \log 2$

$\frac{\sin}{-\cos} = 2 \rightarrow \sin = -2\cos$

$\sin^2 + \cos^2 = 1$

$4\cos^2 + \cos^2 = 1$

$\cos^2 = \frac{1}{10}$

$\cos = \frac{-1}{\sqrt{10}}$

$\sin = +\frac{2}{\sqrt{10}}$

$\sin - \cos = +\frac{2}{\sqrt{10}} + \frac{1}{\sqrt{10}} = +\frac{3}{\sqrt{10}} = +\frac{3\sqrt{10}}{10}$

۰٫۶

$\log(\sin x) \rightarrow \sin x > 0$

$\log(-\cos x) \rightarrow -\cos x > 0 \rightarrow \cos x < 0$

نامعادله دوم

سوال ۴

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

$\sin^4 \rightarrow (1-\cos^2)^2$

$\cos^4 + 1 - 2\cos^2 + \cos^2 = \frac{5}{4} \rightarrow \cos^4 = \cos^2 - \frac{1}{4}$

$\cos^4 + 3\sin^2$

$\sin^2 \rightarrow 1-\cos^2$

$\rightarrow \cos^2 - \frac{1}{4} + 1 - \cos^2 = \frac{3}{4}$

سوال ۵

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

$1-\cos^2 = \sin^2$

$$\frac{\sin(3+\cos)}{2\sin^2} < 0 \rightarrow \sin < 0$$

$\sin\alpha \frac{\sin}{\cos} - \frac{1}{\cos} > 0$

ناصفر

$\frac{\sin^2 - 1}{\cos} > 0 \quad -\frac{\cos^2}{\cos} > 0 \rightarrow \cos < 0$

سوال ۹

$$\frac{۲}{\sin} = -\frac{۳}{\cos}$$

$$\frac{\sin}{\cos} = -\frac{۲}{۳}$$

$$\sin = -\frac{۲}{۳}\cos$$

۲

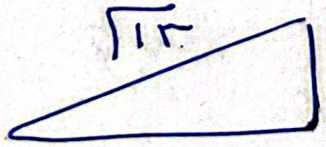
$$\sin^۲ + \cos^۲ = ۱$$

$$\frac{۴}{۹}\cos^۲ + \cos^۲ = ۱$$

$$\frac{۱۳\cos^۲}{۹} = ۱$$

$$\cos^۲ = \frac{۹}{۱۳}$$

$$\cos = \frac{۳}{\sqrt{۱۳}}$$



$$\sin = \frac{-۲}{\sqrt{۱۳}}$$

$$\frac{۲}{\sin ۲\alpha}$$

$$\frac{۲}{۲\sin\frac{۳}{\sqrt{۱۳}}\cdot\frac{-۲}{\sqrt{۱۳}}} = \frac{-۱۳}{۹}$$

$$\frac{\sin}{\cos} + \frac{\cos}{\sin} \rightarrow \frac{\sin^۲ + \cos^۲}{\sin\cos}$$

$$\frac{۱}{\frac{۱}{۲}\sin ۲\alpha}$$

$$\frac{۲}{\sin\cos} + \frac{\cos}{\sin} = \frac{۲}{\sin\cos}$$

$\cos 2\alpha = 2\cos^2 - 1$

$\cos 40 = 2\cos^2 20 - 1 \longrightarrow \cos 40 + 1 = 2\cos^2 20$

$\sqrt{1 + \sin\alpha} \longrightarrow \sqrt{1 + \cos 40} \longrightarrow \sqrt{2\cos^2 20} = \sqrt{2}\cos 20$

$\frac{}{\sin\alpha + \sin 10} \longrightarrow \frac{}{\cos 40 + \cos 80}$

$\cos 80 = 2\cos^2 40 - 1$

$2\cos^2 40 + \cos 40 - 1$

$(\cos 40 + 2)(\cos 40 - 1)$

$-2 \qquad 1$

$-\frac{2}{2} \quad \frac{1}{2}$

۷۵ب

۱,۲۵

$$(1 - 2\sin^2 10)(2\cos^2 20 - 1)\left(\frac{1-\tan^2 40}{1+\tan^2 40}\right)$$

$$\cos 20 \qquad \cos 40 \qquad \cos 80$$

$$\frac{\sin 10 \cdot \cos 20 \cdot \cos 40 \cdot \cos 80}{\sin 10}$$

$$\tfrac{1}{2}\sin 20 \qquad \tfrac{1}{4}\sin 40 \qquad \tfrac{1}{8}\sin 80$$

$$= \frac{\frac{1}{8}\sin 80}{\sin 10} \rightarrow \frac{\frac{1}{8}\cos 10}{\sin 10} = \boxed{\frac{1}{8}\cot 10}$$

$\sin + 2\cos = 2 \longrightarrow \sin = 2 - 2\cos$

(۹۷۱۹)

$\cos^2 + \sin^2 = 1 \longrightarrow (2 - 2\cos)^2 + \cos^2 = 1$

$4 - 8\cos + 4\cos^2 + \cos^2 = 1$

$5\cos^2 - 8\cos + 3 = 0$

$5\cos^2 - 8\cos = -3$ (۲)

$\omega \cos^2\alpha - 4\cos\alpha$ ؟

$\omega(2\cos^2 - 1) - 4\cos \longrightarrow 5\cos^2 - 4 - 4\cos = ?$

-3

-1

سوال ۱

$\sin\beta \sin C = \cos^2\frac{A}{2}$ $\quad \beta = 72$ $\quad A + \beta$

$A + \beta + C = 180 \quad \beta = 72 \rightarrow A + C = 180 - 72 = 108$

$C = 108 - A$

۲

$\sin 72 \sin(108 - A) = \cos^2\frac{A}{2}$

$\frac{1}{2}[\cos(A - 144) - \cos(180 - A)] = \cos^2\frac{A}{2}$

$-\cos A$

$\frac{1}{2}[\cos(A - 144) + \cos A] = \cos^2\frac{A}{2} = \frac{1 + \cos A}{2}$

$\cos(A - 144) + \cos A = 1 + \cos\beta$

$\cos(A - 144) = 1$

$A - 144 = 0 \quad A = 144$

۶

$\sqrt{1 + \sin 40^\circ} = \sqrt{1 + \cos 50^\circ}$ فرمول طلایی $1 + \cos 2\alpha = 2\cos^2\alpha$

$\sqrt{2\cos^2 25^\circ} = \sqrt{2}|\cos 25^\circ| = \sqrt{2}\cos 25^\circ$

$\sin 40^\circ + \sin 10^\circ = \sin(30^\circ + 10^\circ) + \sin(30^\circ - 10^\circ) =$

$\sin 30^\circ \cos 10^\circ + \sin 10^\circ \cos 30^\circ + \sin 30^\circ \cos 10^\circ - \sin 10^\circ \cos 30^\circ = 2(\frac{1}{2})\cos 25^\circ = \cos 25^\circ$

$\frac{\sqrt{2}\cos 25^\circ}{\cos 25^\circ} = \boxed{\sqrt{2}}$