پارسا طی‌بخش — کلینیک ش. ۱۵ — تعاونی مسیر A

۱۸

۱- $T=\frac{x}{1-2x}=\frac{x}{2} \Rightarrow 13 = x=0 \Rightarrow \tan\frac{x}{4}=1$

Al (۳) ✓ $S=\frac{\frac{x}{2}+1}{2}=\frac{x}{4}$

۲- $x^2\sin\alpha-\frac{1}{4}\cos^2\alpha=0 \Rightarrow x=\frac{2}{3} \Rightarrow \frac{4}{9}-\frac{2}{3}\sin\alpha-$

$\frac{1}{4}(\sin^2\alpha-1)=0 \Rightarrow \frac{1}{4}\sin^2\alpha-\frac{2}{3}\sin\alpha+\frac{7}{36}=0$

$\Rightarrow 9\sin^2\alpha-24\sin\alpha+7=0 \Rightarrow \sin\alpha=\frac{24\pm\sqrt{324}}{18}$ — $\frac{7}{3}$ غ ق ق — $\frac{1}{3}$ ق ق

(۲) ✓

$\Rightarrow$ [illegible] $\Rightarrow (\frac{1}{3})^2=\frac{1}{9} \Rightarrow \cos^2\alpha=\frac{8}{9}$

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

۳- $\log_2^{\sin\alpha}-\log_2^{-\cos\alpha}=\log_2^{2} \Rightarrow \frac{\sin}{-\cos}=2 \Rightarrow \sin\alpha=-2\cos\alpha$

$\sin^2\alpha+\cos^2\alpha=1 \Rightarrow 5\cos^2\alpha=1 \Rightarrow \cos^2\alpha=\frac{1}{5}$ — $\cos\alpha=-\frac{1}{\sqrt5}$ — $\cos\alpha=+\frac{1}{\sqrt5}$

$\frac{1}{\sqrt5} \Rightarrow$ غ ق ق $\Rightarrow$ زیر لوگ x منفی

$\sin\alpha-\cos\alpha=\frac{2}{\sqrt5}+\frac{1}{\sqrt5}=\frac{3}{\sqrt5}$ (۲) ✓

۴- $\sin^4\alpha + \cos^2\alpha = \frac{4}{5} \Rightarrow (1-\cos^2\alpha)^2 + \cos^2\alpha = \frac{4}{5}$

$\Rightarrow 1 - 2\cos^2\alpha + \cos^4\alpha + \cos^2\alpha = \frac{4}{5} \Rightarrow \underbrace{1-\cos^2\alpha}_{\sin^2\alpha} + \cos^4\alpha = \frac{4}{5}$

$\Rightarrow \sin^2\alpha + \cos^4\alpha = \frac{4}{5}$ ۲ ✓

۵- $\frac{\sin x(3 + \overbrace{\cos x}^{\text{همواره مثبت}})}{2(1-\cos^2 x)} < 0$. $\frac{3\sin x + \sin x\cos x}{2 - 2\cos^2 x} < 0$

$\frac{\sin x}{2\sin^2 x} < 0 \Rightarrow \sin x < 0$. $\frac{\sin^2 x - 1}{\cos x} > 0 \Rightarrow \frac{-\cos^2 x}{\cos x} > 0$

$\cos x < 0$ ناحیه سوم

۶- $\frac{2}{\sin\alpha} + \frac{3}{\cos\alpha} = 0 \Rightarrow \frac{2\cos\alpha + 3\sin\alpha}{\sin\alpha\cos\alpha} = 0$

$\Rightarrow 2\cos\alpha + 3\sin\alpha = 0 \Rightarrow \cos\alpha = -\frac{3\sin\alpha}{2}$

$\tan\alpha + \cot\alpha = \frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha} = \frac{\cos^2\alpha + \sin^2\alpha}{\sin\alpha\cos\alpha} = \frac{\sin\alpha}{-\frac{3}{2}\sin\alpha} + \frac{-\frac{3}{2}\sin\alpha}{\sin\alpha}$

$= -\frac{2}{3} - \frac{3}{2} = -\frac{13}{6}$ ۴ ✓

۷- $\frac{\sqrt{1+\sin 50}}{\sin 50 + \sin 10} \Rightarrow$ $1 + \sin 50 = \sin 90 + \sin 50 = 2\sin(70)\cos(20) = 2\cos^2(20) \cdot \cos^2 20$

$\sin 50 + \sin 10 = \cancel{2\sin 30}\cos 20 = \cos 20 \Rightarrow \frac{\cancel{\sqrt{2}}\sqrt{2}\cos 20}{\cos 20}$

$= \sqrt{2}$

۴ ✓

$1-2\sin^2 5 = 1-\sin^2 5 - \sin^2 5 \Rightarrow \cos^2 5 - \sin^2 5 = \cos 10$ _8

$2\cos^2 10 - 1 = \sin 10 \cdot \cos 10 = \cos 20$

$\dfrac{1-\tan^2 20}{1+\tan^2 20} = \cos 40 \qquad \cos 10 \cdot \cos 20 \cdot \cos 40 = \dfrac{\sin 10}{\sin 10}$

$\cancel{\tfrac{1}{2}\sin 20}\ \cancel{\tfrac{1}{4}\sin 40}\ \tfrac{1}{8}\sin 80 \qquad \cos 10$

$= \dfrac{\cancel{\sin 10 \cos 10} \cdot \cos 20 \cdot \cos 40}{\sin 10} = \dfrac{1}{8}\,\dfrac{\sin 80}{\sin 10} = \dfrac{1}{8}\cot 10$

2

$\sin\alpha + 3\cos\alpha = 3 \Rightarrow \sin\alpha = 3 - 3\cos\alpha$ _9

$1 = \sin^2 + \cos^2\alpha \Rightarrow (3-3\cos\alpha)^2 + \cos^2\alpha = 1 \Rightarrow 10\cos^2\alpha - 18\cos\alpha = -8$

[illegible]: $\cos^2\alpha = \dfrac{1+\cos 2\alpha}{2} \Rightarrow \cos 2\alpha = 2\cos^2\alpha - 1$

$\Rightarrow 5\cos 2\alpha = 10\cos^2\alpha - 5 \Rightarrow 10\cos^2\alpha - 18\cos\alpha - 5$

$= -8$

2

$\sin\alpha \cdot \sin\beta = \frac{1}{2}(\cos(\alpha-\beta) - \cos(\alpha+\beta))$ _10

$\Rightarrow \sin B \cdot \sin C = \frac{1}{2}(\cos(B-C) - \cos(B+C))$

$\cos A \cdot \cos B = \frac{1}{2}(\cos(A+B) + \cos(A-B)) = \cos\frac{a}{2} \cdot \cos\frac{3a}{2}$

P4PCO

$= \frac{1}{2}(\cos A + \cos 0) \quad , \quad A+B+C = 180 \Rightarrow B = 180-(A+C)$

$\Rightarrow B+C = 180-A$

$\Rightarrow \frac{1}{2}\left(\cos(180-(2C+A)) - \cos(180-A)\right) = \frac{1}{2}(-\cos 2C+A + \cos A)$

$\frac{1}{2}\cos A + \frac{1}{2} = -\frac{1}{2}\cos 2C+A + \frac{1}{2}\cos A \Rightarrow \cos 2C+A = -1$

$\Rightarrow 2C+A = 180 \Rightarrow C = B = 72 \Rightarrow A = 180-(72+72) = \underline{36}$

ب ✓