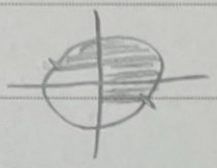
زهرا جیحانی — یازدهم تجربی — ۱۹

۱- $\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha > 0$

$\frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|} \rightarrow \sin\alpha > 0$

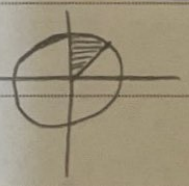
در ناحیه‌ی اول ✓

۲- $-\frac{\pi}{4} < x < \frac{3\pi}{4}$ 

$\frac{m-1}{4} = 1 \rightarrow m = 5$

$-\frac{1}{2} < \sin 2x \leq 1 \rightsquigarrow \frac{m-1}{4} \leq -\frac{1}{2} \rightarrow m \leq -1$ ✓

$-1 < m \leq 5$

۳- $\pi < 2x < 2\pi \rightarrow \frac{\pi}{2} < x < \frac{\pi}{2}$ 

$\frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha} = -3 \rightarrow \sin\cos = -\frac{1}{3}$

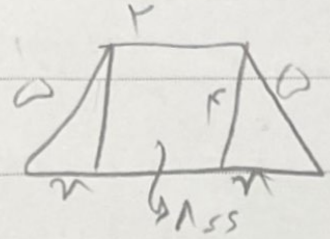
$\rightsquigarrow \frac{1}{\sin\cos} = -3 \rightarrow -3\sin\cos\alpha = 1$

$\underbrace{\sin^2 + \cos^2}_{1} - \frac{2}{3} = \frac{1}{3} \rightarrow \sin + \cos = \pm\frac{1}{\sqrt{3}}$

$\frac{3\pi}{4} < x < \pi \rightarrow \sin x + \cos x < 0 \rightarrow -\frac{1}{\sqrt{3}}$ ✓

$\rightsquigarrow \frac{1}{\sin^3 + \cos^3} = -\frac{3\sqrt{3}}{4}$

۴-



$\cos\theta = \frac{x}{5} = 0/6 \rightarrow x = 3$

$S_{کل} = 2(6) + 8 = \boxed{20}$

$S = \frac{3 \times 4}{2} = 6 = S$

۵-

$\Rightarrow k\cos^2 15^\circ \rightarrow \tan(\frac{3\pi}{2} + 15)\tan(15 - \pi) \Rightarrow -1$

$-\sin 15 \cos(\frac{3\pi}{2} - 15) = -\sin 15^\circ \rightarrow -1 + \sin^2 15 = -\cos^2 15$

$\boxed{k = -1}$

۶-

$A = \sqrt{3}\cos(210^\circ)\sin(240)$

$-\sqrt{2}\sin(135^\circ)\cos(150^\circ) = \sqrt{3}(-\frac{\sqrt{3}}{2})\sin(\frac{3\pi}{2} - 30^\circ) - \sqrt{2}(\frac{\sqrt{2}}{2})$

$(\cos(\pi - 30)) \rightarrow \frac{3}{2}\cos 30 + \cos 30 = \frac{5}{2}\cos 30^\circ$

$\boxed{\frac{5\sqrt{3}}{4}}$

۷-

$\cos^2\alpha = \frac{1 + \cos 2\alpha}{2} \rightarrow \cos^2(\frac{\pi}{12}) = \frac{1 + \frac{\sqrt{3}}{2}}{2} = \frac{2 + \sqrt{3}}{4}$

$\frac{3}{4} \times \frac{2 + \sqrt{3}}{4} = \boxed{\frac{6 + 3\sqrt{3}}{16}}$

Arman

۸- $\sin^2 x + \sin x = 1 - \sin^2 x$

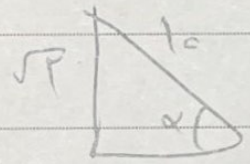
$2\sin x = -1 \rightarrow \sin x = -\frac{1}{2} \rightarrow \cos x = -\frac{\sqrt{3}}{2}$ (۵)

$\tan\frac{x}{2} = \frac{\sin x}{1+\cos x} = \frac{-\frac{1}{2}}{1-\frac{\sqrt{3}}{2}} = \boxed{-2-\sqrt{3}}$

۹- $\frac{\sin\alpha}{1+\cos\alpha} - \frac{1-\cos\alpha}{\sin\alpha} = \tan\frac{\alpha}{2}$

$\cot\frac{\theta}{2} + \cot\frac{\theta}{2} = 2\cot\theta \rightarrow \boxed{k=2}$ (۵)

۱۰-



$\sqrt{2}\sin\left(\alpha+\frac{\pi}{4}\right) = \sin\alpha + \cos\alpha$

$\sin\left(\alpha+\frac{\pi}{4}\right) = -\frac{1}{2} \rightarrow \cos\left(\alpha+\frac{\pi}{4}\right) = -\frac{\sqrt{3}}{2}$

$|\sin\alpha| < |\cos\alpha| \rightarrow \frac{\pi}{4} < \alpha < \pi$ (۱)

$\rightarrow \cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\left(\pi - \left(\frac{\pi}{4} + \alpha\right)\right) \Rightarrow$

$-\cos\left(\alpha + \frac{\pi}{4}\right) = \boxed{+\frac{\sqrt{3}}{2}}$

$-\frac{\sqrt{3}}{2}$

Arman

$$\cos\left(\frac{11\pi}{12}+\alpha\right) = -\left(\cos\alpha\cos\frac{\pi}{12} + \sin\alpha\sin\frac{\pi}{12}\right)$$

$$\rightarrow \frac{-\sqrt{2}}{2}(\cos\alpha+\sin\alpha) \qquad \cos\alpha = \frac{-\sqrt{\sqrt{2}}}{10}$$

$$\hookrightarrow -\frac{\sqrt{2}}{2}\left(\frac{-\sqrt{\sqrt{2}}}{10}+\frac{\sqrt{2}}{10}\right) = \frac{\mu}{\omega}$$