«هندسه کل سرفصل» «تکلیف شماره ۱۵» «دوازدهم ریاضی A»

(۱)

(۲) $\frac{4}{9}-\frac{2}{3}\sin\alpha-\frac{1}{4}\cos^2\alpha=0 \rightarrow \frac{4}{9}-\frac{2}{3}\sin\alpha-\frac{1}{4}+\frac{1}{4}\sin^2\alpha=0 \xrightarrow{\times 4}$   ($\cos^2\alpha = 1-\sin^2\alpha$)

$\sin^2\alpha-\frac{8}{3}\sin\alpha+\frac{7}{9}=0 \xrightarrow{\times 9} 9\sin^2\alpha-24\sin\alpha+7=0 \Rightarrow (3\sin\alpha-1)(3\sin\alpha-7)=0$

$\frac{1}{3}$ ✓✓  $\frac{7}{3}$ = غ ق ق

$\sin\alpha=\frac{1}{3} \rightarrow \frac{1}{9}+\cos^2\alpha=1 \rightarrow \cos^2=\frac{8}{9} \rightarrow \cos\alpha=\frac{2\sqrt{2}}{3}$

$1+\tan^2\alpha=\frac{1}{\cos^2\alpha} \rightarrow \frac{1}{\frac{8}{9}} \Rightarrow \boxed{\frac{9}{8}}$

(۳) $\underbrace{\log\frac{\pm\sin}{\cos\alpha}}_{-\cos\alpha=\cos\alpha}=\cancel{\log}\,3 \rightarrow \frac{\sin\alpha}{\cos\alpha}=3 \rightarrow \sin\alpha=3\cos\alpha \rightarrow 9\cos^2\alpha+\cos^2\alpha=1$

$10\cos^2\alpha=1 \rightarrow \cos=\frac{1}{\sqrt{10}}=\frac{\sqrt{10}}{10} \rightarrow \sin\alpha=\frac{3\sqrt{10}}{10} \rightarrow \sin-\cos \rightarrow \frac{3\sqrt{10}}{10}-\frac{\sqrt{10}}{10}=\boxed{\frac{\cancel{2}\sqrt{10}}{\cancel{10}\,5}}$

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

$\cos^4\alpha+\sin^4\alpha \rightarrow (1-\cos^2\alpha)^2+\cos^2\alpha \rightarrow \boxed{\frac{4}{5}}$

$1-\cos^2\alpha$   $\sin^2\alpha$   $\sin^4\alpha$

(۵) $\frac{\cancel{\sin\alpha}\,(3+\cos\alpha)}{2(1-\cos^2\alpha)}<0 \rightarrow \frac{3+\cos\alpha}{2\sin\alpha}<0 \rightarrow \boxed{\sin\alpha<0}$

همواره مثبت ← زیرا $-1\leq\cos\alpha\leq 1$

$\sin^2\alpha$

$\sin\alpha\times\frac{\sin\alpha}{\cos\alpha}-\frac{1}{\cos\alpha}>0 \rightarrow \frac{\sin^2-1}{\cos\alpha}>0 \rightarrow -\cos\alpha>0 \rightarrow \boxed{\cos\alpha<0}$

$-\cos^2\alpha$

⟸ انتهای کمان در ناحیه سوم است!

(۶) $\frac{2}{\sin\alpha} + \frac{3}{\cos\alpha} = 0 \longrightarrow \frac{2\cos\alpha + 3\sin\alpha}{\sin\cos\alpha} = 0 \longrightarrow 2\cos\alpha + 3\sin\alpha = 0 \longrightarrow 2\cos\alpha = -3\sin\alpha$

(۱) مختلف العلامه $\sin\alpha , \cos\alpha$

(۲) $\cos\alpha = \frac{-3}{2}\sin\alpha$

$\longrightarrow \frac{9}{4}\sin^2\alpha + \sin^2\alpha = 1 \longrightarrow \frac{13}{4}\sin^2\alpha = 1 \longrightarrow \sin\alpha = \frac{2}{\sqrt{13}}$

$\longrightarrow \cos\alpha = \frac{-3}{\sqrt{13}} \Longrightarrow \tan\alpha = \frac{\frac{2}{\sqrt{13}}}{\frac{-3}{\sqrt{13}}} = \boxed{\frac{-2}{3}} \qquad \boxed{\cot\alpha = \frac{-3}{2}}$

$\longrightarrow \tan\alpha + \cot\alpha = \frac{-2}{3} - \frac{3}{2} = \frac{-9-4}{6} = \boxed{\frac{-13}{6}}$

(۷)

(۸) $(1 - 2\sin^2 5)(2\cos^2 10 - 1)\left(\frac{1-\tan^2 20}{1+\tan^2 20}\right)$

$(\cos 10)$ $\qquad \underbrace{\cos 20}$ $\qquad \underbrace{\cos 40}$ $\qquad -1 + \cos^2 20$

$(\cos^2 10 - \sin^2 10)$ $\qquad \underbrace{(\cos^2 20 - \sin^2 20)}$

$(2\cos^2 20 - 1)$

$\cos^2 10 - \sin^2 10 \longrightarrow (2\cos^2 10 - 2\sin^2 10 - 1)$

(۹)

(۱۰) $\sin B \sin C = \frac{1 + \cos A}{2} \longrightarrow 2\sin B \sin C = 1 + \cos A$