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به نام خدا

۱) الف) $\tan\frac{11\pi}{4} + \sin\frac{15}{4}\pi \cos\frac{13\pi}{4} \Rightarrow \tan(3\pi - \frac{\pi}{4}) + \sin(4\pi - \frac{\pi}{4})\cos(3\pi + \frac{\pi}{4})$

$\to -\tan\frac{\pi}{4} + (-\sin\frac{\pi}{4})(-\cos\frac{\pi}{4}) \to -1 + (\frac{\sqrt{2}}{2})(-\frac{\sqrt{2}}{2}) \to -1 + (\frac{1}{2}) = -0/5 = -\frac{1}{2}$

ب) $\tan\frac{17\pi}{6}\sin\frac{11\pi}{3} + \cos\frac{10\pi}{3} \Rightarrow \tan(3\pi - \frac{\pi}{6})\sin(4\pi - \frac{\pi}{3}) + \cos(3\pi + \frac{\pi}{3})$

$\to -\tan\frac{\pi}{6} \times -\sin\frac{\pi}{3} + (-\cos\frac{\pi}{3}) \to -\frac{\sqrt{3}}{3} \times -\frac{\sqrt{3}}{2} - \frac{1}{2} = \frac{1}{2} - \frac{1}{2} =$ صفر

۲) $\frac{3\cos x - \sin x}{\cos x + \sin x} \to \frac{\cos}{\sin} = \frac{4k}{1k} \to \frac{12k - k}{4k + k} = \frac{11k}{5k} = 2/2$

۳) $\sin^2 + \cos^2 = 1 \to (2\cos)^2 + \cos^2 = 1 \to 4\cos^2 + \cos^2 = 1 \to 5\cos^2 = 1$

$\to \cos^2 = \frac{2}{10} \to \cos\alpha = \frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5} \to \frac{\sqrt{5}}{5}$

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

$\frac{2}{100} + \cos^2 = 1$

$\cos^2 = \frac{7\sqrt{2}}{10}$

۴) الف) $\cos(3\pi - \frac{\pi}{4} + a) = \cos(\frac{3\pi}{4} + a) = \cos\frac{3\pi}{4}\cos a - \sin\frac{3\pi}{4}\sin a$

$\to -\frac{\sqrt{2}}{2} \times \frac{7\sqrt{2}}{10} - (\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10}) = +\frac{14}{20} - \frac{2}{20} = \frac{+12}{20} = \frac{6}{10} = \frac{3}{5}$

ب) $\sin(3\pi + \frac{\pi}{4} + a) = \sin(\frac{5\pi}{4} + a) = \sin\frac{5\pi}{4}\cos a + \sin a \cos\frac{5\pi}{4}$

$-\frac{\sqrt{2}}{2} \times \frac{7}{5\sqrt{2}} + \frac{1}{5\sqrt{2}} \times -\frac{\sqrt{2}}{2} = -\frac{7}{10} - \frac{1}{10} = -\frac{8}{10} = -\frac{4}{5}$

۵) $\cos^2 = \frac{4}{3} - 2\sin^2 \to \sin^2 + \frac{4}{3} - 2\sin^2 = 1 \to 2\sin^2 - \sin^2 = \frac{1}{3}$

$\to \sin^2 = \frac{1}{3} \to \sin\alpha = \frac{\sqrt{3}}{3} \to \cos = \frac{\sqrt{6}}{3} \to \tan^2 = \frac{\frac{3}{9}}{\frac{6}{9}} = \frac{1}{2} = 0/5$

۶) $S = \frac{1}{2}\sqrt{3} \times 6 \times \sin\alpha = 4/5 \to \sin\alpha = \frac{\frac{45}{10}}{\frac{3\sqrt{3}}{1}} = \frac{15}{\frac{20 \times 1}{2 \times 3\sqrt{3}}} = \frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$

$\frac{\sqrt{3}}{2}$ < بیشترین $= 90°$ ، کمترین $= 120°$ $\to \frac{120}{60} = 2$

۷) $S = ab\sin\alpha \to \frac{b}{a} = \frac{3k}{2k} \to 2k \times 3k \times \frac{1}{2} = 54 \to 3k^2 = 54 \to k^2 = 18$

$k = \sqrt{18} = 3\sqrt{2} \Rightarrow b = 9\sqrt{2}\ ,\ a = 6\sqrt{2} \to 2(6\sqrt{2}) + 2(9\sqrt{2}) =$

$12\sqrt{2} + 18\sqrt{2} = 30\sqrt{2}$

$\left(\frac{1}{2}\times 8\times V\times \sin\hat{A}\right)-\left(\sin A\times\frac{1}{2}\times V\times 2\right)=4V\to\left(\frac{\sqrt{15}}{2}\sin A-\frac{\sqrt{15}}{2}\sin A\right)$ (۱)

$\sin\hat{A}\left(\frac{\sqrt{15}}{2}-\frac{\sqrt{15}}{2}\right)=4V\to\frac{V}{2}\sin A\to\sin A=\frac{V}{\Sigma}=\frac{1}{2}=\sin A^{-1}\to\cos=\frac{\sqrt{3}}{2}$

$\tan=\frac{\frac{1}{V}}{\frac{\sqrt{15}}{2}}=\frac{\sqrt{15}}{3}$

$\frac{\frac{1}{2}\sin B\times AB\times CB}{\frac{1}{2}\times\sin B\times BM\times BN}=\frac{AB\times\frac{1}{2}AC}{BM\times\frac{1}{2}AC}=\frac{3}{1}$ (۹)

$\frac{BM}{AM}=\frac{BM}{8BM}=\frac{10}{8}=\frac{5}{4}$

(۱۵)

$\sin>0$

$-\frac{1}{\cot\alpha}=-\tan\alpha=-\frac{\sin\alpha}{\cos\alpha}=\frac{|\sin\alpha|}{\cos\alpha}\longrightarrow$ سوال (۱۰)

$|\sin\alpha|=-\sin\alpha\to\sin\alpha<0$ ✓

حالت اول $\cos\alpha>0\to|\cos\alpha|=\cos\alpha$

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

$\frac{1}{\cos\alpha}-\frac{\sin\alpha}{\cos\alpha}=\frac{1+\sin\alpha}{\cos\alpha}\to\cos\alpha>0\to\sin=\cos 30$

حالت دوم $\cos\alpha<0\to|\cos\alpha|=-\cos\alpha\to\frac{+1}{-\cos\alpha}-\frac{\sin\alpha}{\cos\alpha}=\frac{1+\sin}{-\cos}$

$\to\cos\alpha<0$ ✓

ناحیه دوم