$\sqrt{3}\cos(210)\sin(240+3)-\sqrt{3}\sin(150)\cos(150+3)=\frac{3}{2}\left(-\frac{\sqrt{3}}{2}\cos 3-\frac{1}{2}\sin 3\right)-\frac{\sqrt{3}}{2}\left(-\frac{\sqrt{3}}{2}\cos 3-\frac{1}{2}\sin 3\right)$ $-\frac{3\sqrt{3}}{4}\cos 3-\frac{3\sin 3}{4}+\frac{\sqrt{3}}{4}\cos 3+\frac{1}{4}\sin 3=\frac{2\sqrt{3}}{4}\cos 3-\frac{3\sqrt{3}}{4}\cos 3+\frac{2\sin 3}{4}-\frac{3\sin 3}{4}=-\frac{\sqrt{3}}{4}\cos 3-\frac{\sin 3}{4}$ $\cos(27)=\cos(30-3)=\cos 30\cos 3+\sin 30\sin 3=\frac{\sqrt{3}}{2}\cos 3+\frac{\sin 3}{2}$ $\quad \frac{-\frac{1}{4}(\sqrt{3}\cos 3-\sin 3)}{\frac{1}{2}(\sqrt{3}\cos 3+\sin 3)}$	۶
$16\cos^2(\frac{\pi}{12})\cos^2(\frac{\pi}{6})\cos^2(\frac{\pi}{3})\cos^2(\frac{3\pi}{4})=(8+4\sqrt{3})(\frac{3}{4})(\frac{1}{4})(\frac{1}{2})=\frac{3\times 4(2+\sqrt{3})}{4\times 4\times 4}$ $\frac{3(2+\sqrt{3})}{16}$ $\cos^2 15=\frac{1+\cos 30}{2}=\frac{2+\sqrt{3}}{4}$	۷
$\tan\frac{\alpha}{2}=\frac{1-\cos\alpha}{1+\cos\alpha}$ $\quad 4+4\sin x=1-\sin x$ $\quad \sin x=-\frac{3}{5}$ $\sin^2\alpha+\cos^2\alpha=1\rightarrow\frac{9}{25}+\cos^2\alpha=1$ $\quad \cos\alpha=\frac{4}{5}$ $\tan\frac{\alpha}{2}=\frac{1-\frac{4}{5}}{1+\frac{4}{5}}=\frac{\frac{1}{5}}{\frac{9}{5}}=\frac{1}{9}$	۸
$\cot\frac{\alpha}{2}=\frac{1+\cos\alpha}{1-\cos\alpha}k$ $\quad \frac{1+\cos\alpha}{1-\cos\alpha}k=\frac{\sin\alpha}{1-\cos\alpha}+\frac{1+\cos\alpha}{\sin\alpha}=\frac{\sin^2\alpha+1+\cos^2\alpha}{\sin\alpha-\sin\alpha\cos\alpha}$ $k=\frac{2}{\sin\alpha-\sin\alpha\cos\alpha}\times\frac{1-\cos\alpha}{1+\cos\alpha}=\frac{2-2\cos\alpha}{\sin\alpha+\sin\alpha\cos\alpha-\sin\alpha\cos\alpha-\sin\alpha\cos^2\alpha}\Rightarrow k=\frac{2-2\cos\alpha}{\sin\alpha-\sin\alpha\cos^2\alpha}=$ $\frac{2(1-\cos\alpha)}{\sin\alpha(1-\cos\alpha)(1+\cos\alpha)}=\frac{2}{\sin\alpha(1+\cos\alpha)}$	۹
$\cos(\frac{11\pi}{2}+\alpha)=-\sin\alpha=-\frac{\sqrt{2}}{10}$	۱۰

نام و نام خانوادگی ...شایان معالی... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱

$\frac{1}{|\cos\alpha|} - \frac{1}{\cos\alpha} = \frac{1-\sin\alpha}{|\cos\alpha|} \rightarrow -\frac{\sin\alpha}{\cos\alpha} = \frac{1-\sin^2\alpha-1}{|\cos\alpha|} \qquad -\frac{\sin\alpha}{\cos\alpha} = \frac{-\sin\alpha}{|\cos\alpha|}$

$\cos\alpha > 0$

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

ناحیه اول

۲

$\xrightarrow{\times 2} -\frac{\pi}{6} < 2x < \frac{5\pi}{6} \xrightarrow{\sin} -\frac{1}{2} < \sin 2x < \frac{1}{2}$

$-\frac{1}{2} < \frac{m-1}{4} < \frac{1}{2} \qquad -2 < m-1 < 2 \qquad -1 < m < 3$

۳

$\frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha} = -3 \qquad \frac{\sin^2\alpha+\cos^2\alpha}{\cos\alpha\sin\alpha} = \frac{1}{\cos\alpha\sin\alpha} = -3 \qquad \cos\alpha\sin\alpha = -\frac{1}{3}$

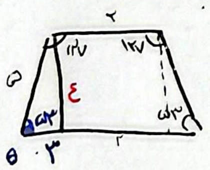
$(\sin\alpha+\cos\alpha)^2 = \sin^2\alpha+\cos^2\alpha+2\sin\alpha\cos\alpha = 1-\frac{2}{3} = \frac{1}{3}$

$\cos\alpha > \sin\alpha \qquad \sin\alpha+\cos\alpha = \frac{-1}{\sqrt{3}} = \frac{-\sqrt{3}}{3} \qquad \frac{3\pi}{4} < \alpha < \pi$

$\frac{1}{(\sin\alpha+\cos\alpha)(\sin^2\alpha+\cos^2\alpha+\sin\alpha\cos\alpha)} = -\frac{9}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = -\frac{3\sqrt{3}}{2}$

۴

$\cos\theta = 0.6 \qquad \theta = 53^\circ \qquad 180-53 = 127 \qquad \frac{(3+2+3+2)4}{2} = 20$



$\frac{6}{10} \times 5 = 3$

$\tan(300-15)\tan(15-180) - \sin15\cos(270-15) = \frac{\tan300-\tan15}{1+\tan300\tan15} \times \frac{\tan15-\tan180}{1+\tan15\tan180} - \sin15(\cos270\cos15+\sin270\sin15)$

$\frac{-\sqrt{3}-\tan15}{1-\sqrt{3}\tan15} \times \tan15 - \sin15(-\sin15) = \frac{-\sqrt{3}(2-\sqrt{3})-(2-\sqrt{3})^2}{1-\sqrt{3}(2-\sqrt{3})} + \frac{1-\sqrt{3}}{4} \qquad \sin^2 15 = \frac{1-\cos30}{2} = \frac{1-\frac{\sqrt{3}}{2}}{2}$

$\frac{2\sqrt{3}-4}{4-2\sqrt{3}} + \frac{1-\sqrt{3}}{4} = -\frac{3\sqrt{3}}{4} \qquad k\cos^2 15 = -\frac{3\sqrt{3}}{4} \qquad k = \frac{-(3+\sqrt{3})}{2+\sqrt{3}} \qquad \tan15 = \frac{1-\cos30}{\sin30} = 2-\sqrt{3}$

$k\frac{2+\sqrt{3}}{4} = -\frac{3\sqrt{3}}{4}$

$\cos^2 15 = \frac{1+\cos30}{2} = \frac{2+\sqrt{3}}{4}$