نام و نام خانوادگی ...امیرحسین مرعشی... پاسخنامه تشریحی تکلیف شماره ..۲۸.. کلاس ...یازدهم...

۱۹٫۵

۱ (۲)

$$\frac{1}{|\cos\alpha|}-\frac{\sin}{\cos\alpha}=\frac{1-\sin\alpha}{|\cos\alpha|}\begin{cases}\xrightarrow{\text{مثبت}}\ \dfrac{1-\sin\alpha}{\cos\alpha}=\dfrac{1-\sin\alpha}{\cos\alpha}\ \checkmark \longrightarrow \boxed{\cos\alpha>0}\\[2mm] \xrightarrow{\cos\alpha<0}\ \dfrac{-1-\sin\alpha}{\cos\alpha}=-\dfrac{1-\sin\alpha}{\cos\alpha}\ \times\end{cases}$$

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

$\Longrightarrow$ انتهای کمان α در ناحیه‌ی اول مثلثاتی قرار دارد.

۲ (۲)

$$-\frac{\pi}{12}<x<\frac{5\pi}{12}\longrightarrow-\frac{\pi}{6}<2x<\frac{5\pi}{6}\longrightarrow-\frac{1}{2}<\sin 2x\leq 1$$

$$-\frac{1}{2}<\frac{m-1}{4}\leq 1\longrightarrow -2<m-1\leq 4\longrightarrow\boxed{-1<m\leq 5}$$

۳ (۲)

$$\tan+\cot=-3\longrightarrow\frac{1}{\sin\alpha\cos\alpha}=-3\Longrightarrow\sin\alpha\cos\alpha=-\frac{1}{3}$$

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

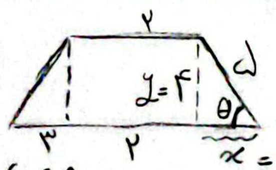
$$\frac{\sin}{\cos}+\frac{\cos}{\sin}=\frac{\sin^2+\cos^2}{\sin\cos}$$

چون $\frac{3\pi}{4}<x<\pi$ $\longrightarrow \sin+\cos=-\frac{1}{\sqrt{3}}$

$$\frac{1}{\sin^3+\cos^3}=\frac{1}{\underbrace{(\sin+\cos)}_{-\frac{1}{\sqrt{3}}}(\underbrace{\sin^2+\cos^2}_{1}-\underbrace{\sin\cos}_{+\frac{1}{3}})}=\frac{1}{\left(-\frac{1}{\sqrt{3}}\right)\times\left(\frac{4}{3}\right)}=$$

پاسخ $\longleftarrow$ $\boxed{-\frac{3\sqrt{3}}{4}}$

۴ (۲)



$$\cos\theta=\frac{x}{5}=\frac{6}{10}\longrightarrow x=3$$

$$\sin\theta=\frac{y}{5}=\frac{8}{10}\longrightarrow\boxed{y=4}$$

$$S=\frac{(2+8)(\cancel{4}^{\,2})}{\cancel{2}_{\,1}}=20$$

۵ (۲)

$$\tan(285^\circ)\tan(-165^\circ)=\tan\left(\frac{3\pi}{2}+15^\circ\right)\times\tan(-\pi+15^\circ)=-\cot15^\circ\times+\tan15^\circ=-1$$

$$\sin(105^\circ)\times\cos(255^\circ)=\sin15^\circ\times\cos\left(\frac{3\pi}{2}-15^\circ\right)=\sin15^\circ\times-\sin15^\circ=-\sin^2 15^\circ$$

$$\longrightarrow\tan(285^\circ)\times\tan(-165^\circ)-\sin(105^\circ)\cos(255^\circ)=-1+\sin^2 15^\circ=-(1-\sin^2 15^\circ)$$

$$=-\cos^2 15^\circ\Longrightarrow\boxed{k=-1}$$

$\sqrt{3}\times(-\frac{\sqrt{3}}{2})\times\sin(\frac{3\pi}{2}-27^\circ)-\sqrt{2}\times(-\frac{\sqrt{2}}{2})\times\cos(\pi-27^\circ)=$ $\to \underbrace{-\frac{3}{2}\times-\cos27^\circ}_{\frac{3}{2}\cos27^\circ}-\underbrace{(\frac{2}{2})\times-\cos27^\circ}_{-(-1\cos27^\circ)}=\frac{3}{2}\cos27^\circ+\cos27^\circ=\frac{5}{2}\cos27^\circ$ $\frac{5}{2}$ برابر $\cos27^\circ$ است.	۲	۶
$f(\frac{\pi}{36})=\cancel{16}\,\underbrace{\cos^2(\frac{\pi}{12})}_{\frac{2+\sqrt3}{\cancel{4}}}\,\underbrace{\cos^2(\frac{\pi}{6})}_{\frac{3}{\cancel{4}}}\times\underbrace{\cos^2(\frac{\pi}{3})}_{\frac14}\times\underbrace{\cos^2(\frac{2\pi}{3})}_{\frac14}=\frac{3(2+\sqrt3)}{16}=\boxed{\frac{6+3\sqrt3}{16}}$ $\cos^2\frac{\pi}{12}=\frac{1+\cos\frac{\pi}{6}}{2}=\frac{1+\frac{\sqrt3}{2}}{2}=\frac{2+\sqrt3}{4}$	۲	۷
$\cos x<0$ $\sin x<0$ $1-\sin x=4+4\sin x\to 3=-5\sin x\to\sin x=-\frac{3}{5}\to\cos x=-\frac{4}{5}$ $\sin^2(\frac{x}{2})=\frac{1-\cos x}{2}=\frac{1+\frac45}{2}=\frac{9}{10}\to\sin(\frac{x}{2})=+\frac{3}{\sqrt{10}}\Rightarrow\cos(\frac{x}{2})=-\frac{1}{\sqrt{10}}$ $\to\tan(\frac{x}{2})=\frac{\sin(\frac{x}{2})}{\cos(\frac{x}{2})}=\frac{+\frac{3}{\sqrt{10}}}{-\frac{1}{\sqrt{10}}}=\boxed{-3}$ $\quad\frac{\pi}{2}<\frac{x}{2}<\frac{3\pi}{4}\to$ ناحیه دوم	۱٫۵	۸
$\frac{\sin\theta}{1-\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=\frac{\sin^2\theta+\sin^2\theta}{\sin\theta(1-\cos\theta)}=\frac{2\sin^{\cancel{2}}\theta}{\cancel{\sin\theta}(1-\cos\theta)}=\frac{2\sin\theta}{1-\cos\theta}$ $\to\frac{\cancel{2}\sin\theta}{\cancel{2}\sin^2(\frac{\theta}{2})}=\frac{\frac{\sin\theta}{\sin\theta}}{\frac{\sin^2(\frac{\theta}{2})}{\sin\theta}}=\frac{1}{\frac{\sin^2(\frac{\theta}{2})}{\sin(\theta)}}=\frac{2}{\frac{\sin^2(\frac{\theta}{2})}{\sin(\frac{\theta}{2})\cos(\frac{\theta}{2})}}=\frac{2\cos(\frac{\theta}{2})}{\sin(\frac{\theta}{2})}=2\cot(\frac{\theta}{2})$ $\boxed{k=2}$ $\sin^2(\frac{\theta}{2})=\frac{1-\cos\theta}{2}\to 1-\cos\theta=2\sin^2(\frac{\theta}{2})$ | $\sin\theta$ =	۲	۹
$\cos\alpha<0$ $\sin\alpha>0\to\sin\alpha=\frac{\sqrt2}{10}\Rightarrow\cos\alpha=-\frac{\sqrt{98}}{10}=-\frac{7\sqrt2}{10}$ $\cos(\frac{11\pi}{4}+\alpha)=\cos(\frac{3\pi}{4}+\alpha)=\underbrace{\cos(\frac{3\pi}{4})}_{-\frac{\sqrt2}{2}}\cos\alpha-\underbrace{\sin(\frac{3\pi}{4})}_{\frac{\sqrt2}{2}}\sin\alpha=-\frac{\sqrt2}{2}\times-\frac{7\sqrt2}{10}-\frac{\sqrt2}{2}\times\frac{\sqrt2}{10}$ $3\pi-\frac{\pi}{4}=\pi-\frac{\pi}{4}=\frac{3\pi}{4}$ ناحیه ۲ $\quad\frac{7}{10}-\frac{1}{10}=\boxed{\frac{6}{10}}\to$ پاسخ	۲	۱۰

۸-

$$\sin x = \frac{۲\tan\frac{x}{۲}}{۱+\tan^{۲}\frac{x}{۲}} = \frac{-۳}{۵} \rightarrow ۱۰\tan\frac{x}{۲} = -۳ - ۳\tan^{۲}\frac{x}{۲}$$

$\tan\frac{x}{۲} = \frac{-۱}{۳}$ × غیرصحیح!

$\boxed{\tan\frac{x}{۲} = -۳}$ ✓