پاسخنامه تشریحی تکلیف شماره ... ۲۰۸ ... کلاس ... یازدهم ... B ... آبان ... ۱۷/۷۵

$\cot\alpha = \frac{\cos\alpha}{|\sin\alpha|}$ ، $\frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{|\cos\alpha|} = \frac{1-\sin\alpha}{|\cos\alpha|} \times \frac{\cos\alpha}{\cos\alpha}$

ناصیه اول مثلثاتی (۲)

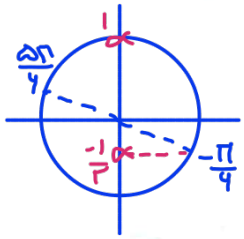
$\frac{\cos\alpha}{\sin\alpha} = \frac{\cos\alpha}{|\sin\alpha|}$ ، $\frac{\cos\alpha - |\cos\alpha|(\sin\alpha)}{|\cos\alpha|\cos\alpha} = \frac{\cos\alpha - \cos\alpha\sin\alpha}{|\cos\alpha|\cos\alpha}$ ، $\cos\alpha > 0$

$\sin\alpha > 0$ ۱

$\frac{-\pi}{12} < \alpha < \frac{5\pi}{12} \rightarrow \frac{-\pi}{6} < 2\alpha < \frac{5\pi}{6} \rightarrow -\frac{1}{2} < \sin 2\alpha \leq 1 \rightarrow -\frac{1}{2} < \frac{m-1}{4} \leq 1$

$-2 < m-1 \leq 4 \rightarrow -1 < m \leq 5$ (۱/۷۵)

دقت!



۲

$\tan\alpha + \cot\alpha < 0 \rightarrow$ ناصیه ۲ و ۴ (I) ، $2\pi < \alpha < \frac{5\pi}{4} \rightarrow$ ناصیه ۳ و ۴ (II)

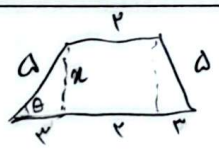
جواب: II ∪ I (۱/۵)

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

$(\sin\alpha + \cos\alpha)^2 = \sin^2\alpha + \cos^2\alpha + 2\sin\alpha\cos\alpha(\sin\alpha + \cos\alpha)$ ۳

$\hookrightarrow \sin\alpha + \cos\alpha = \frac{\sqrt{3}}{2}$

$\rightarrow \sin^2\alpha + \cos^2\alpha = \frac{3}{4} + \frac{2}{4} = \frac{5}{4}$ ، $\frac{1}{\sin^2\alpha + \cos^2\alpha} = \frac{4}{5} = \frac{4\sqrt{3}}{5}$



$x^2 + x^2 = 25$ ، $x^2 = 16 \rightarrow x = 4$ ۴

$S = \frac{10 \times 4}{2} = 20$ ✓ (۲)

$-\cot 15^\circ \times \tan 15^\circ - \sin 15^\circ \times (-\sin 15^\circ) = \sin^2 15 - 1 = -\cos^2 15$

$= -1$

دقت!

$\Leftrightarrow K = -1$ (۱/۷۵)

۵

$\sqrt{2} \times \left(-\frac{\sqrt{3}}{2}\right) \times (-\cos 27^\circ) - \sqrt{2} \times \frac{\sqrt{2}}{2} \times (-\cos 27^\circ) = \frac{\sqrt{3}}{2}(\cos 27^\circ) + \cos 27^\circ$

$= \frac{\sqrt{3}}{2} \cos 27^\circ \quad \Rightarrow$ برابر $\frac{\sqrt{3}}{2}$ ✓

۲

۶

$14 \times \cos^2 \frac{\pi}{12} \times \cos \frac{\pi}{6} \times \cos \frac{\pi}{4} \times \cos \frac{\pi}{3} = 14 \times \frac{1+\frac{\sqrt{3}}{2}}{2} \times \left(\frac{\sqrt{2}}{2}\right)^2 \times \frac{1}{2} \times \frac{1}{2}$

$\frac{1}{4} \times \frac{1}{4}$

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

۱٫۵

۲

$1 - \sin x = 5 + 5\sin x \rightarrow 6\sin x = -4 \rightarrow \sin x = -\frac{4}{5}$ ، $\cos x = -\frac{3}{5}$

$\tan^2 \frac{x}{2} = \frac{1-\cos x}{1+\cos x} \rightarrow \tan^2 \frac{x}{2} = \frac{\frac{8}{5}}{\frac{2}{5}} = 4 \rightarrow \tan \frac{x}{2} = 2$

$\pi < x < \frac{3\pi}{2} \rightarrow \frac{\pi}{2} < \frac{x}{2} < \frac{3\pi}{4}$

$\tan \frac{x}{2} < 0 \rightarrow \tan \frac{x}{2} = \boxed{-2}$

۱٫۴

۸

$\frac{\sin\theta}{1-\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = 2\cot\frac{\theta}{2} \Leftrightarrow k = 2$ ✓

$\cot\frac{\theta}{2}$ $\quad$ $\cot\frac{\theta}{2}$

۲

۹

$\cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\left(2\pi + \frac{3\pi}{4} + \frac{\pi}{4} + \alpha\right) = \sin\left(\frac{\pi}{4} + \alpha\right)$! ناحیه دوم $\alpha \rightarrow \cos\alpha < 0$

$\sin\left(\frac{\pi}{4} + \alpha\right) = \frac{\sin\alpha + \cos\alpha}{-\sqrt{2}} = \frac{\frac{\sqrt{2}}{10} - \frac{\sqrt{98}}{10}}{-\sqrt{2}} = \frac{\sqrt{2}+\sqrt{98}}{\sqrt{2} \times 10} = \frac{1+7}{10} = \frac{8}{10} = \frac{4}{5}$

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

۱٫۳

۱۰

۳-

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

$$3\pi < 4\alpha < 4\pi \rightarrow \frac{3}{4}\pi < \alpha < \pi \xrightarrow{\sin\alpha+\cos\alpha<0} \frac{-\sqrt{3}}{3}$$

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

$$\hookrightarrow 1-\left(\frac{-1}{3}\right) = \frac{4}{3}$$

$$\rightarrow \frac{1}{\sin^3\alpha+\cos^3\alpha} = \boxed{\frac{-3}{4}\sqrt{3}}$$

۷-

$$f\left(\frac{\pi}{24}\right) = 16\cos^2\left(\frac{\pi}{12}\right)\cos^2\left(\frac{\pi}{4}\right)\cos^2\left(\frac{\pi}{3}\right)\cos^2\left(\frac{2\pi}{3}\right)$$

$$\cos^2\frac{\pi}{12} = \frac{1+\cos\frac{\pi}{6}}{2} = \frac{1+\frac{\sqrt{3}}{2}}{2} \rightarrow \cos^2\frac{\pi}{12} = \frac{2+\sqrt{3}}{4}$$

$$f\left(\frac{\pi}{24}\right) = 16\left(\frac{2+\sqrt{3}}{4}\right)\times\frac{3}{4}\times\frac{1}{4}\times\frac{1}{4} = \boxed{\frac{3(2+\sqrt{3})}{16}}$$

۸-

$$\sin\alpha = \frac{2\tan\frac{\alpha}{2}}{1+\tan^2\frac{\alpha}{2}} = \frac{-3}{5} \rightarrow 10\tan\frac{\alpha}{2} = -3-3\tan^2\frac{\alpha}{2}$$

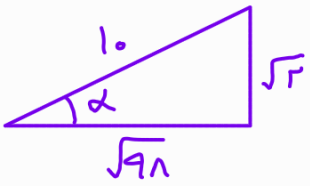
$\tan\frac{\alpha}{2} = \frac{-1}{3}$ × غ‌ق‌ق!

$\boxed{\tan\frac{\alpha}{2} = -3}$ ✓

۱۰-

$$\cos\left(\frac{11\pi}{4}+\alpha\right) = \cos\left(3\pi-\frac{\pi}{4}+\alpha\right) = -\cos\left(\alpha-\frac{\pi}{4}\right)$$

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



ناحیه دوم $\xrightarrow{}$ $\cos\alpha = \frac{-\sqrt{98}}{10}$

$$-\frac{\sqrt{2}}{2}\left(\cos\alpha+\sin\alpha\right) = -\frac{\sqrt{2}}{2}\left(-\frac{\sqrt{98}}{10}+\frac{\sqrt{2}}{10}\right) = \frac{3}{5}$$