تکلیف شمارهٔ ۲۸ — یازدهم ب — مهرشاد جابرزاده

16

۱- $\cot\alpha = \frac{\cancel{\cos\alpha}}{\cancel{\sin\alpha}} = \frac{\cos\alpha}{\sqrt{\sin^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|} = \frac{\cos\alpha}{\sin\alpha} \Rightarrow \sin\alpha = |\sin\alpha| \Rightarrow \sin\alpha \geq 0$ (۲)

ناحیه اول و دوم I

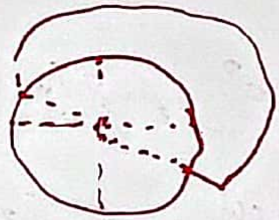
$$\cancel{\frac{1}{|\cos\alpha|}} + \underset{\frac{1}{\cot\alpha}}{\frac{\sin\alpha}{\cos\alpha}} = \cancel{\frac{1}{|\cos\alpha|}} + \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{\cos\alpha} = \frac{1}{|\cos\alpha|} \Rightarrow \cos\alpha \geq 0$$

ناحیه اول و چهارم II

$I \cap II \to \alpha$ در ناحیه اول قرار دارد ✓

۲- (۲)

$$-\frac{\pi}{12} \leq x \leq \frac{5\pi}{12} \to -\frac{\pi}{6} \leq 2x \leq \frac{5\pi}{6} \to$$



$$-\frac{1}{2} \leq \sin 2x \leq 1 \to -\frac{1}{2} \leq \frac{m-1}{2} \leq 1 \to -1 \leq m \leq 3$$ ✓

۳- (۱)

$$\tan\alpha + \cot\alpha = -3 \to \frac{\overset{1}{\cancel{\sin^2\alpha+\cos^2\alpha}}}{\sin\alpha\cos\alpha} = -3 \to \sin\alpha\cos\alpha = -\frac{1}{3}$$ ✓

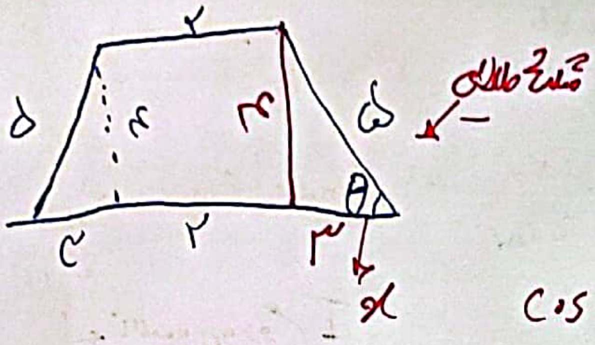
$$(\sin\alpha+\cos\alpha)^3 = \sin^3\alpha+\cos^3\alpha+3\sin\alpha\cos\alpha(\sin\alpha+\cos\alpha)$$

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

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

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

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



-۴

$(۲\times۴)+۱۲=\boxed{۲۰}$

۲

$\cos\theta=\frac{x}{۵}=\frac{۶}{۱۰}$

-۵

۲

$\tan(۲۸۵)=\tan(\frac{۳\pi}{۲}+۱۵)=-\cot(۱۵)$

$\tan(-۱۶۵)=\tan(\underbrace{\pi+۱۵}_{-۱۶۵})=\tan(۱۵)$

$\sin(۱۰۹۵^\circ)=\sin(۶\pi+۱۵)=\sin(۱۵)$

$\cos(۲۵۵)=\cos(\frac{۳\pi}{۲}-۱۵)=-\sin(۱۵)$

$\underbrace{-\cot(۱۵)\times\tan(۱۵)}_{}-(-\sin^۲(۱۵))$

$-۱+\sin^۲(۱۵)=-\cos^۲(۱۵)=k\cos^۲(۱۵)$

$۱-\cos^۲(۱۵)$

$\Downarrow$

$k=-۱$

-۶

۲

$\cos(۲۱۰)=-\frac{\sqrt{۳}}{۲}$, $\sin(۲۴۳)=\sin(\frac{۳\pi}{۲}-۲۷)=-\cos(۲۷)$

$\sin(۱۳۵)=\frac{\sqrt{۲}}{۲}$, $\cos(۱۵۳)=\cos(\pi-۲۷)=-\cos ۲۷$

$۲۴\times-\frac{\sqrt{۳}}{۲}\times-\cos(۲۷)=\frac{۳}{۲}\cos(۲۷)-(\underbrace{\sqrt{۲}\times\frac{\sqrt{۲}}{۲}\times-\cos(۲۷)}_{-\cos ۲۷})=(\frac{۳}{۲}+۱)\cos(۲۷)$

$\frac{۵}{۲}$

$=۱\cos(۲۷)$ برابر $\frac{۵}{۲}$ است A

if $x=\frac{\pi}{24} \Rightarrow 2x=\frac{\pi}{12},\ 6x=\frac{\pi}{4},\ 8x=\frac{\pi}{3},\ 16x=\frac{2\pi}{3}$ — -7

$1/75$

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

$$\cancel{16}\times\frac{1+\cos\frac{\pi}{6}}{2}\times\left(\frac{\sqrt{2}}{2}\right)^2\times\frac{1}{\cancel{4}}\times\frac{1}{\cancel{4}}=\frac{(2+\sqrt{3})\times 2}{4\times\cancel{2}\times 2\times 2}=\frac{4+2\sqrt{3}}{\cancel{2}\ 16}$$

$$\frac{1+\frac{\sqrt{3}}{2}}{2}=\frac{2+\sqrt{3}}{4}$$

$$\frac{1-\sin x}{1+\sin x}\times\frac{1-\sin x}{1-\sin x}=\frac{1-2\sin x+\sin^2 x}{\cancel{1-\sin^2 x}\ \cos^2 x}=4$$ — -8

$0/75$

$$1-2\sin x+\sin^2 x=4-4\sin^2 x\rightarrow 5\sin^2 x-2\sin x-3=0$$

$4+60=64=\Delta\rightarrow \sin x_1=\frac{2-8}{10}$

$\rightarrow \sin_2 x=\frac{10}{10}=1$ غقق $\quad\left(\frac{-6}{10}\right)$ ✓

در ربع سوم!

2.

$\rightarrow \cos x=1-\frac{36}{100}=\frac{64}{100}\Rightarrow \cos x=-\frac{8}{10}$

$$\sin x=2\sin\frac{x}{2}\times\cos\frac{x}{2}$$

$$\cancel{-\frac{6}{10}}\ -\frac{3}{10}=\sin\frac{x}{2}\times\cos\frac{x}{2}\rightarrow \cos\frac{x}{2}=\frac{-10\sin\left(\frac{x}{2}\right)}{3}$$

$$\cos x=\cos^2\frac{x}{2}-\sin^2\frac{x}{2}=\frac{100\sin^2\left(\frac{x}{2}\right)}{9}-\frac{9\sin^2\left(\frac{x}{2}\right)}{9}=\frac{91}{9}\sin\frac{x}{2}=\cancel{\cos x}\ \frac{8}{10}$$

$$\sin\left(\frac{x}{2}\right)=\frac{8}{65}$$

$$\cos\frac{x}{2}=\frac{-10\times\frac{8}{65}}{3}=\frac{-80}{195}=-\frac{16}{39}$$

$$\tan\left(\frac{x}{2}\right)=-\frac{\frac{\cancel{8}}{195}}{\frac{\cancel{16}}{39}}\ 2 \qquad \frac{37}{90}=\frac{3}{10}$$

$$\frac{\sin^2\theta + \cancel{1-\cos\theta}\ \sin^2}{\sin\theta - \sin\theta\cos\theta} = \frac{2\sin^2\theta}{}$$

(۰٫۵) -۹

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

$$\frac{2\sin\theta}{1-\cos\theta} = \frac{2\times 2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\sin^2\frac{\theta}{2}} = 2\cot\frac{\theta}{2} \rightarrow \boxed{K=2}$$

$$\sin\alpha = \frac{\sqrt{2}}{10} \Rightarrow \cos\alpha = \cancel{1-\sin^2\alpha}$$

$$1-\frac{1}{50} = \frac{49}{50} = \cos^2\alpha \Rightarrow \cos\alpha = -\left(\frac{7}{\sqrt{50}}\right)$$

(۲) -۱۰

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

$$\cancel{2\pi} + \frac{3\pi}{4}$$

$$\cancel{-\frac{\sqrt{2}}{2}}\times\cancel{-}\frac{7}{\sqrt{50}} = \frac{7}{10} - \left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{10}\right) = \frac{1}{10}$$

$$\cancel{5\sqrt{2}}$$

$$\frac{7-1}{10} = \frac{6}{10}$$

$$\cos\left(\frac{11\pi}{4}+\alpha\right) \leftarrow$$

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

-۸

$\tan\frac{x}{2} = \frac{-1}{3}$ × غیر صحیح!

$$\boxed{\tan\frac{x}{2} = -3}$$

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