تکلیف شماره ۲۸ یازدهم ب مهرشاد جابرزاده

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

← ناحیه اول و دوم I

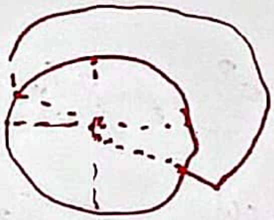
$\cancel{\frac{1}{|\cos\alpha|}} + \frac{\sin\alpha}{\cos\alpha} = \cancel{\frac{1}{|\cos\alpha|}} + \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{1}{\cos\alpha} = \frac{1}{|\cos\alpha|} \Rightarrow \cos\alpha \geq 0$

$\frac{\sin\alpha}{\cos\alpha} \downarrow \frac{1}{\cot\alpha}$

← ناحیه اول و چهارم II

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

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

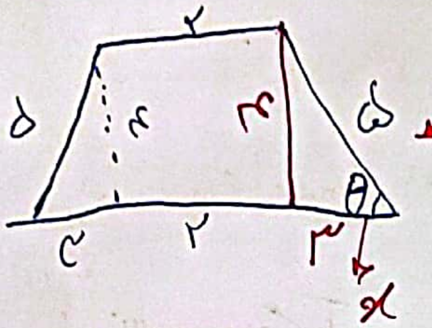


$-\frac{1}{2} \leq \sin 2x \leq 1 \rightarrow -\frac{1}{2} \leq \frac{m-1}{4} \leq 1 \rightarrow -1 \leq m \leq 5$

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

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

۴-



$(2\times4)+12=\boxed{20}$

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

۵-

$\tan(285) = \tan\left(\frac{3\pi}{2}+15\right) = -\cot(15)$

$\tan(-165) = \tan(\underbrace{\pi+15}_{-165}) = \tan(15)$

$\sin(1095^\circ) = \sin(6\pi+15) = \sin(15)$

$\cos(255) = \cos\left(\frac{3\pi}{2}-15\right) = -\sin(15)$

$\underbrace{-\cot(15)\times\tan(15)}_{}-(-\sin^2(15))$

$-1+\underset{1-\cos^2(15)}{\sin^2(15)} = -\cos^2(15) = k\cos^2(15)$

$\Downarrow$

$k=-1$

۶-

$\cos(210) = -\frac{\sqrt3}{2}$ ، $\sin(234) = \sin\left(\frac{3\pi}{2}-36\right) = -\cos(36)$

$\sin(135) = \frac{\sqrt2}{2}$ ، $\cos(144) = \cos(\pi-36) = -\cos 36$

$\sqrt3\times-\frac{\sqrt3}{2}\times-\cos(36) = \frac{3}{2}\cos(36) - (\underbrace{\sqrt2\times\frac{\sqrt2}{2}\times-\cos(36)}_{-\cos 36}) = (\frac{3}{2}+1)\cos(36)$

$\frac{5}{2}$

ضریب $\cos(36)$ ، $\frac{5}{2}$ است A

if $x = \frac{\pi}{24} \Rightarrow 2x = \frac{\pi}{12}$, $6x = \frac{\pi}{4}$, $12x = \frac{\pi}{2}$, $36x = \frac{3\pi}{2}$ — 7

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

$$\cancel{16} \times \frac{1+\cos\frac{\pi}{6}}{2} \times \left(\frac{\sqrt{2}}{2}\right)^2 \times \frac{1}{\cancel{4}} \times \frac{1}{\cancel{4}} \quad \frac{(2+\sqrt{3}) \times 2}{2 \times 4} = \frac{6+4\sqrt{3}}{8}$$

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

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

$$4 + 4 \cdot 5 \cdot 3 = \Delta \rightarrow \sin x_1 = \frac{2-8}{10}$$

$$\xrightarrow{2} \cos x = 1 - \frac{36}{100} = \frac{64}{100} \rightarrow \cos x = \frac{8}{10}$$

$$\sin_2 x = \frac{10}{10} = 1 \quad \text{غ ق ق} \qquad \left(-\frac{6}{10}\right) \checkmark$$

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

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

$$\cos x = \cos^2\frac{x}{2} - \sin^2\frac{x}{2} =$$

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

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

$$\cos\frac{x}{2} = \frac{-10 \times \frac{8}{65}}{3} = \frac{-80}{195} = -\frac{16}{27}$$

$$\tan\left(\frac{x}{2}\right) = -\frac{\frac{\cancel{8}}{195}}{\frac{\cancel{16}}{27}}\ 2 \qquad \frac{27}{90} = \frac{3}{10}$$

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

-10

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

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

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

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

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

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

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

$$\cos\left(\frac{11\pi}{4} + \alpha\right) \leftarrow \frac{6}{10}$$

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