همسا بوطالبی

۱-

$$8\cos x = \frac{\cancel{\tan^2 x + 1}}{\frac{1}{\cos^2\alpha}} \Rightarrow$$

$$\frac{8\cos^3 x - 1}{\cos^2 x} = 0 \qquad 8\cos^3 x - 1 = 0 \qquad 8\cos^3 x = 1$$

$$\cos x = \frac{1}{2}$$

$$\cos^2 x \neq 0 \quad R - \{k\pi + \frac{\pi}{2}\} \qquad \boxed{2k\pi \pm \frac{\pi}{3}}$$

۲-

$$5(1 - \cos^2 x) + 2\cos 3x = -2$$

$$5 - 5\cos^2 x + 2\cos 3x = -2$$

$$2(4\cos^3\alpha - 3\cos\alpha)$$

$$5 - 5\cos^2\alpha + 8\cos^3\alpha - 6\cos\alpha = -2$$

$$8\cos^3\alpha - 5\cos^2\alpha - 6\cos\alpha + 7 = 0$$

if $\Rightarrow \cos = -1$ در این عبارت $= 0$ $\Rightarrow$ در نتیجه $(\cos x + 1)$ دارد

$$8\cos^3 x + 8\cos^2 x - 13\cos^2 x - 13\cos x + 7\cos x + 7$$

$$8\cos^2 x(\cos x + 1) - 13\cos x(\cos x + 1) + 7(\cos x + 1)$$

$$(\cos x + 1)(8\cos^2 x - 13\cos x + 7)$$

$$\Delta = 169 - 224 = -55 \qquad \Delta < 0 \Rightarrow$$

فقط $\cos x + 1$ جواب می‌دهد

$$\cos x = -1$$

$$k\pi + \pi \to \pi, \; -\pi$$ ۲ جواب دارد

ـ۳

$$۲\sin(x)\cos ۲x + \sin x = ۱$$

$$۲\left(\frac{۱}{۲}\right)\left(\sin(۳x) + \sin(-x)\right) + \sin x = ۱$$

$$\sin ۳x - \cancel{\sin x} + \cancel{\sin x} = ۱ \quad ۲k\pi + \frac{\pi}{۲}$$

$$۳x = \frac{۲k\pi}{۳} + \frac{\pi}{۶}$$

$$\frac{\pi}{۶} \qquad \frac{۵\pi}{۶} \qquad \frac{۹\pi}{۶}$$

$$\frac{۱۵\pi}{۶} = \frac{۳\pi}{۲}$$

ـ۴

$$\frac{۱}{\cos ۲x} + \frac{۱}{-\sin ۴x} = ۰ \qquad \frac{\cos ۲x(-۲\sin ۲x + ۱)}{\substack{-\sin ۴x + \cos ۲x \\ \hline -\cos ۲x \sin ۴x}} = ۰$$

$$\sin ۲x = \frac{۱}{۲} \quad \text{ا} \leftarrow \quad -۲\sin ۲x + ۱ = ۰ \quad \leftarrow ۲ \quad \cos ۲x \neq ۰$$

برابر می‌کنند $\frac{\pi}{۱۲}$ و $\frac{۵\pi}{۱۲} \Rightarrow \alpha = \frac{۴\pi}{۱۲}$ $\qquad \tan \frac{۲\pi}{۳} = -\sqrt{۳}$

$$\cos\left(x+\frac{\pi}{4}\right)=\frac{1}{\sqrt{3}}$$ ۵ـ

$$m(\cos x-\sin\alpha)$$

$$\sin\left(x-\frac{\pi}{4}\right)$$

$$-m\left(\sqrt{2}\sin\left(x-\frac{\pi}{4}\right)\right)-3\sqrt{6}\sin 2x=\sqrt{6}$$

$$\sin\left(x+\frac{\pi}{4}-\frac{\pi}{2}\right)$$

$$\frac{\cancel{\sqrt{2}}m}{\sqrt{3}}=\frac{\cancel{\sqrt{6}}}{\sqrt{3}}(3\sin 2a-1)\quad \cos\alpha=\frac{1}{\sqrt{2}}$$

$$\Rightarrow \boxed{m=9\sin 2a-3}$$

$$\sin\left(x+\frac{\pi}{6}\right)\cos\left(x+\frac{\pi}{6}-\frac{\pi}{2}\right)=1$$ ۶ـ

$$\sin^2\left(\frac{\pi}{6}+x\right)=1\qquad \frac{\pi}{6}+x=k\pi\pm\frac{\pi}{2}$$

$$x=k\pi\cancel{+}\frac{4\pi}{6}\ ،$$

$$x=k\pi\cancel{+}\frac{2\pi}{6}$$

۷ـ

$$\sin x+\sqrt{3}\cos x=\sqrt{2}$$

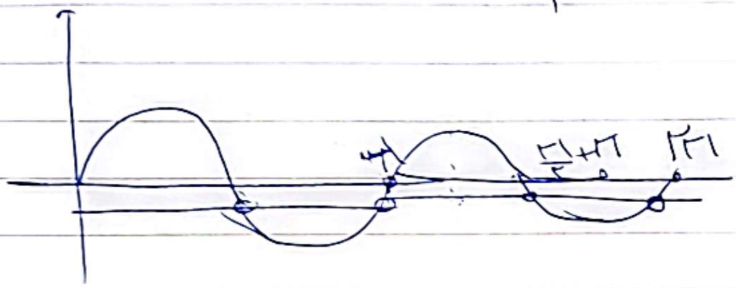
$$2\sin\left(x+\underbrace{\cancel{\arctan\sqrt{3}}}_{\frac{\pi}{3}}\right)=\sqrt{2}\Rightarrow\quad \sin\left(x+\frac{\pi}{3}\right)=\frac{\sqrt{2}}{2}$$

$$x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4}\Rightarrow x=2k\pi-\frac{\pi}{12}$$

$$x+\frac{\pi}{3}=2k\pi+\pi-\frac{\pi}{4}\Rightarrow x=2k\pi+\frac{5\pi}{12}$$

$4\sin x\cos x = 1 \Rightarrow -2\sin 2x = 1$ -8

$\sin 2x = \frac{-1}{2}$



$\frac{2\cancel{4}\times\left(\frac{4\pi+\pi}{2}\right)}{\cancel{4}} \Rightarrow 4\pi+\pi = \underline{5\pi}$

$(2\cos^2\alpha)(2\cos^2 2\alpha)(2\cos^2 4\alpha) = \frac{1}{8}$ -9

$8\cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha = \frac{1}{8} \Rightarrow \cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha = \frac{1}{64}$

$\sin\alpha\left(\cos\alpha\cos 2\alpha\cos 4\alpha = \frac{1}{8}\right)$

$\frac{1}{2}\sin 2\alpha\cos 2\alpha = \frac{1}{4}\sin 4\alpha \Rightarrow \frac{1}{\cancel{8}}\sin 8\alpha = \frac{1}{\cancel{8}}\sin\alpha \Rightarrow$

$2k\pi+\pi-8\alpha=\alpha = \frac{2k\pi}{9}$ $\quad 2k\pi+8\alpha=\alpha \Rightarrow \quad \alpha=\frac{2k\pi}{7}$ ، $\frac{2k\pi}{9}$

$\tan(3x) = \frac{1}{\tan x}$ $\cot x$ $\tan\left(\frac{\pi}{2}-x\right)$ 15

$k\pi+3x = \frac{\pi}{2}-x \Rightarrow k\pi-\frac{\pi}{2} = -4x \Rightarrow$

$\frac{k\pi-\frac{\pi}{2}}{-4} = \boxed{\frac{k\pi}{4}+\frac{\pi}{8}}$