

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

$$x = 2k\pi \pm \frac{\pi}{3}$$

$$\frac{\pi}{3} \text{ و } \frac{5\pi}{3} \Rightarrow \text{پایان}$$

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~~$$\omega \sin^2 x + 2(\cos^2 x + 1) = 0$$~~

$$\omega \sin^2 x = 0 \Rightarrow x = k\pi \Rightarrow -\pi, 0, \pi$$

$$2 \cos^2 \frac{x}{2} = 0 \Rightarrow \frac{x}{2} = k\pi + \frac{\pi}{2} \Rightarrow x = 2k\pi + \pi \Rightarrow -\pi, -\frac{\pi}{2}, \frac{\pi}{2}, \pi$$

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$$\frac{1}{\cos x} + \frac{1}{-\sin x} = 0 \Rightarrow \frac{1}{\cos x} = \frac{1}{\sin x} \Rightarrow \sin x = \cos x$$

$$\cos\left(\frac{\pi}{4} + x\right) \Rightarrow \tan \frac{\pi}{4} = -\frac{\sqrt{3}}{4}$$

$$x = 2k\pi + \frac{\pi}{4} - \frac{\pi}{4} \Rightarrow x = \frac{k\pi}{2} \Rightarrow 0, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}$$

$$x = 2k\pi + \frac{\pi}{4} - \frac{\pi}{4} \Rightarrow k\pi + \frac{\pi}{4} \Rightarrow 0, \frac{\pi}{4}, \frac{5\pi}{4}, \frac{3\pi}{4}$$

$$\cos\left(x + \frac{\pi}{4}\right) = \frac{\sqrt{4}}{4} \Rightarrow x + \frac{\pi}{4} = 2k\pi \pm \frac{\pi}{4} \Rightarrow x = \begin{cases} 2k\pi - \frac{\pi}{4} \\ 2k\pi - \frac{3\pi}{4} \end{cases}$$

$$x = -\frac{\pi}{4} \Rightarrow m(\cos \frac{\pi}{12} - \sin \frac{\pi}{12}) - \sqrt{4} \sin(-\frac{\pi}{4}) = \sqrt{4}$$

$$m(\cos \frac{\pi}{12} - \sin \frac{\pi}{12}) = -\frac{\sqrt{4}}{2} \Rightarrow m^2(1 - \sin \frac{\pi}{4}) = \frac{2}{2} \Rightarrow m = 1$$

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$$\sin\left(x + \frac{\pi}{4}\right) \cos\left(x - \frac{\pi}{4}\right) = 1 \Rightarrow \sin(\alpha) \sin(\alpha) = 1 \quad \boxed{x = 2k\pi + \frac{\pi}{4}} \leftarrow$$

~~$$\alpha = x + \frac{\pi}{4}$$~~

$$x + \frac{\pi}{4} - \frac{\pi}{4}$$

$$\alpha - \frac{\pi}{4}$$

$$\sin \alpha = 1 \Rightarrow \alpha = 2k\pi + \frac{\pi}{4} \Rightarrow x + \frac{\pi}{4} = 2k\pi + \frac{\pi}{4}$$

$$\sin \alpha = -1 \Rightarrow \alpha = 2k\pi - \frac{\pi}{4} \Rightarrow x + \frac{\pi}{4} = 2k\pi - \frac{\pi}{4}$$

$$\boxed{x = 2k\pi - \frac{\pi}{4}} \Rightarrow \frac{\pi}{4}, \frac{5\pi}{4} \text{ (جواب)}$$

$$\sqrt{2} \sin\left(x + \frac{\pi}{4}\right) = \sqrt{2} \Rightarrow x + \frac{\pi}{4} = 2k\pi + \frac{\pi}{4} \Rightarrow x = 2k\pi$$

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

$$\text{جواب: } -\frac{\pi}{12}, \frac{5\pi}{12}, \frac{11\pi}{12}, \frac{17\pi}{12}$$

$$-\sqrt{2} \sin x \cos x = 1 \Rightarrow -\sqrt{2} \sin 2x = 1 \Rightarrow \sin 2x = -\frac{1}{\sqrt{2}}$$

$$2x = 2k\pi - \frac{\pi}{4} \Rightarrow x = k\pi - \frac{\pi}{8} \Rightarrow \frac{11\pi}{8}, \frac{15\pi}{8}$$

$$2x = 2k\pi + \frac{3\pi}{4} \Rightarrow x = k\pi + \frac{3\pi}{8} \Rightarrow \frac{3\pi}{8}, \frac{11\pi}{8}$$

$$(\sqrt{2} \cos \alpha)(\sqrt{2} \cos \beta)(\sqrt{2} \cos \gamma) = \frac{1}{\sqrt{2}} = \sqrt{2} (\cos \alpha \cos \beta \cos \gamma)$$

$$\pm \frac{1}{\sqrt{2}} = \cos \alpha \cos \beta \cos \gamma \times \frac{\sin \alpha}{\sin \alpha} \Rightarrow \frac{\sin \alpha}{\sin \alpha} = \pm \frac{1}{\sqrt{2}} \Rightarrow \sin \alpha = \pm \frac{1}{\sqrt{2}}$$

$$\sin \alpha = \sin \beta$$

$$\sin \alpha = \sin(-\alpha)$$

$$\alpha = 2k\pi - \alpha \Rightarrow \alpha = k\pi$$

$$\alpha = 2k\pi + \pi + \alpha \Rightarrow \alpha = k\pi + \frac{\pi}{2}$$

$$\alpha = 2k\pi + \alpha \Rightarrow \alpha = k\pi$$

$$\alpha = 2k\pi + \pi - \alpha \Rightarrow \alpha = k\pi + \frac{\pi}{2}$$

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

$$2x = k\pi + \frac{\pi}{2} - x \Rightarrow x = \frac{k\pi}{3} + \frac{\pi}{6}$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}, \frac{7\pi}{6}$$