

$$1 \cos x = 1 + \tan^2 x$$

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

$$\cos^2 x = \frac{1}{1} \Rightarrow \cos x = \frac{1}{1} \quad \left\{ \begin{array}{l} \frac{\pi}{3} \\ 2\pi - \frac{\pi}{3} \end{array} \right. \quad \text{۲ جواب}$$

$$\left. \begin{array}{l} \sin^2 x = 1 - \cos^2 x \\ \cos(4x) = 4 \cos^4 x - 4 \cos^2 x + 1 \end{array} \right\} \xrightarrow{\text{جایگزینی}} 1 \cos^4 x - 4 \cos^2 x + 4 \cos^2 x + 1 = 0$$

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$$(\cos x + 1)(1 \cos^2 x - 11 \cos x + 7) = 0 \Rightarrow \cos x = -1 \Rightarrow x = \pi \quad \text{۲ جواب}$$

$$x = -\pi$$

$$1 \sin x (1 - 1 \sin^2 x) + \sin x = 1 \Rightarrow 1 \sin^3 x - 1 \sin x + 1 = 0$$

$$(\sin x + 1)(1 \sin^2 x - 1 \sin x + 1) = 0 \Rightarrow (\sin x + 1)(1 \sin x - 1) = 0$$

$$\left. \begin{array}{l} \sin x = -1 \Rightarrow x = \frac{3\pi}{2} \\ \sin x = \frac{1}{1} \Rightarrow x = \frac{\pi}{2}, \frac{5\pi}{2} \end{array} \right\} \text{مجموع: } \pi + \frac{5\pi}{2} = \frac{7\pi}{2} \quad \text{۲ جواب}$$

$$\frac{1}{\sin(\frac{\pi}{2} + x)} + \frac{1}{\cos(\frac{\pi}{2} + x)} = \frac{1}{\cos x} - \frac{1}{\sin x} = \frac{1 \sin^2 x - 1}{\sin x \cos x} = 0$$

$$\Rightarrow \sin^2 x = \frac{1}{1} \quad \left\{ \begin{array}{l} x = k\pi + \frac{\pi}{2} \Rightarrow x = k\pi + \frac{\pi}{2} \rightarrow x = \frac{\pi}{2} \\ x = k\pi + \frac{3\pi}{2} \Rightarrow x = k\pi + \frac{3\pi}{2} \rightarrow x = \frac{3\pi}{2} \end{array} \right. \quad \text{۴ جواب}$$

$\tan x = \tan \frac{\pi}{4} = -\sqrt{1}$

$$\left\{ \begin{array}{l} \frac{5\pi}{12} - \frac{\pi}{12} = \frac{\pi}{6} = \alpha \end{array} \right.$$

$$\cos(x + \frac{\pi}{4}) = \sin(\frac{\pi}{4} - x) = -\sin(x - \frac{\pi}{4}) \Rightarrow -\sqrt{2} \sin(x - \frac{\pi}{4}) = \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{4}}{2}$$

$$\Rightarrow \cos x - \sin x = \frac{\sqrt{4}}{2}$$

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

$$\frac{\sqrt{4}}{2} m - 2\sqrt{4} \times \frac{1}{2} = \sqrt{4}$$

$$\frac{1}{2} m - 1 = 1 \Rightarrow m = 4$$

$$\cos\left(x - \frac{\pi}{p}\right), \cos\left(\frac{\pi}{p} - x\right) = \sin\left(x + \frac{\pi}{q}\right) \quad \text{جواب ۲: } \frac{\pi}{p} - \frac{\pi}{q}, \frac{\pi}{p}$$

$$\sin^2\left(x + \frac{\pi}{q}\right) = 1 \quad \begin{cases} \sin\left(x + \frac{\pi}{q}\right) = 1 \Rightarrow x + \frac{\pi}{q} = 2k\pi + \frac{\pi}{2} \Rightarrow x = 2k\pi + \frac{\pi}{q} \\ \sin\left(x + \frac{\pi}{q}\right) = -1 \Rightarrow x + \frac{\pi}{q} = 2k\pi - \frac{\pi}{2} \Rightarrow x = 2k\pi - \frac{\pi}{q} \end{cases}$$

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$$\frac{1}{p} \sin x + \frac{\sqrt{p}}{p} \cos x = \frac{\sqrt{p}}{p}$$

$$\sin\left(x + \frac{\pi}{p}\right) = \sin\left(\frac{\pi}{p}\right)$$

$$x + \frac{\pi}{p} = 2k\pi + \frac{\pi}{p} \Rightarrow x = 2k\pi \Rightarrow 2\pi - \frac{\pi}{p}, -\frac{\pi}{p} \quad \left. \begin{matrix} x + \frac{\pi}{p} = 2k\pi + \pi - \frac{\pi}{p} \Rightarrow x = 2k\pi + \frac{5\pi}{p} \Rightarrow \frac{5\pi}{p} \end{matrix} \right\} \frac{5\pi}{12} + 2\pi - \frac{\pi}{12} - \frac{\pi}{12} = \frac{9\pi}{6}$$

$$\sin\left(\frac{p}{p} - x\right) = -\cos x$$

$$-2x \cdot \sin x \cdot \cos x = 1$$

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

$$x = 2k\pi - \frac{\pi}{q} \Rightarrow x = k\pi - \frac{\pi}{q} \Rightarrow \pi - \frac{\pi}{q} \rightarrow 2\pi - \frac{\pi}{q} \quad \left. \begin{matrix} x = 2k\pi + \frac{5\pi}{q} \Rightarrow x = k\pi + \frac{5\pi}{q} \Rightarrow \frac{5\pi}{q} + \pi + \frac{5\pi}{q} \end{matrix} \right\} \text{مجموع} = 3\pi + \frac{2\pi}{q} = \frac{11\pi}{3}$$

$$1 + \cos t = 2 \cos \frac{t}{2} \quad 2 \cos^2 \alpha \cdot 2 \cos^2 \alpha \cdot 2 \cos^2 \alpha = \frac{1}{\lambda}$$

$$2^4 \times \frac{\sin^2 \alpha}{\sin^2 \alpha} \times \cos^2 \alpha \cdot \cos^2 \alpha \cdot \cos^2 \alpha = 2^4 \times \frac{\sin^2 \alpha}{\sin^2 \alpha} \cdot \cos^2 \alpha \cdot \cos^2 \alpha$$

$$= \frac{\sin^2 \alpha}{\sin^2 \alpha} = 1 \quad \left\{ \begin{array}{l} \sin \alpha \cdot \sin \alpha \rightarrow \alpha = \frac{2k\pi}{q} \\ \sin \alpha \cdot \sin \alpha \rightarrow \alpha = \frac{2k\pi}{q} + \frac{\pi}{q} \\ \sin \alpha \cdot \sin \alpha \rightarrow \alpha = \frac{2k\pi}{q} \end{array} \right. \quad \text{و } \pi \text{ جواب های زائد هستند}$$

$$\text{Max}(\alpha) = \frac{11\pi}{9}$$

$$\tan(x) \cdot \tan(x) = 1$$

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

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

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

$$\frac{9\pi}{\lambda} + \frac{11\pi}{\lambda} + \frac{13\pi}{\lambda} + \frac{15\pi}{\lambda} = 4\pi$$