



جواب کلی معادلات مثلثاتی زیر را بدست آورید.

الف) $\cos 2x = 3 \sin x - 1$ $1 - \sin^2 x = 3 \sin x - 1$ $2 \sin^2 x + 2 \sin x - 2 = 0$ $\sin^2 x + \sin x - 1 = 0$ $(\sin x + 1)(\sin x - 1) = 0$ $\sin x = -1$ $x = 2k\pi + \frac{3\pi}{2}$ $\alpha = 2k\pi + \frac{3\pi}{2}$ $d = 2k\pi + \pi - \frac{\pi}{2}$

ب) $\cos 2x + \cos x - 2 = 0$ $2 \cos^2 x + \cos x - 2 = 0$ $\cos x = \frac{1}{2}$ $\cos x = \cos \frac{\pi}{3}$ $x = 2k\pi + \frac{\pi}{3}$ $x = 2k\pi - \frac{\pi}{3}$ $\alpha = k\pi + \frac{\pi}{3}$ $\alpha = k\pi - \frac{\pi}{3}$

الف) $\sin^2 x - \cos^2 x = \sin 2x$ $-\cos 2x = \sin 2x$ $\tan 2x = -1$ $2x = 2k\pi + \frac{3\pi}{4}$ $x = k\pi + \frac{3\pi}{8}$ $x = k\pi + \frac{5\pi}{8}$ $\alpha = k\pi + \frac{3\pi}{8}$ $\alpha = k\pi + \frac{5\pi}{8}$

ب) $2 \cos^2 x + 2 \sin x \cos x = 1$ $2 \cos^2 x - 1 = 1 - \sin 2x$ $\cos 2x = 1 - \sin 2x$ $\cos 2x = \cos \frac{\pi}{2}$ $2x = 2k\pi + \frac{\pi}{2}$ $x = k\pi + \frac{\pi}{4}$ $x = k\pi - \frac{\pi}{4}$ $\alpha = k\pi + \frac{\pi}{4}$ $\alpha = k\pi - \frac{\pi}{4}$

الف) $\cot x (2 \cos x + 1) = \frac{1}{\sin x}$ $\frac{\cos x}{\sin x} (2 \cos x + 1) = \frac{1}{\sin x}$ $\cos x (2 \cos x + 1) = 1$ $2 \cos^2 x + \cos x - 1 = 0$ $\cos x = \frac{1}{2}$ $\cos x = \cos \frac{\pi}{3}$ $x = 2k\pi + \frac{\pi}{3}$ $x = 2k\pi - \frac{\pi}{3}$ $\alpha = k\pi + \frac{\pi}{3}$ $\alpha = k\pi - \frac{\pi}{3}$

ب) $2 \sin^2 x - \sin x \cos x + \cos^2 x = 1$ $2 \sin^2 x - \sin x \cos x = 1 - \cos^2 x$ $2 \sin^2 x - \sin x \cos x = \sin^2 x$ $\sin^2 x - \sin x \cos x = 0$ $\sin x (\sin x - \cos x) = 0$ $\sin x = 0$ $x = k\pi$ $\sin x - \cos x = 0$ $\tan x = 1$ $x = 2k\pi + \frac{\pi}{4}$ $x = 2k\pi + \frac{5\pi}{4}$ $\alpha = k\pi$ $\alpha = 2k\pi + \frac{\pi}{4}$ $\alpha = 2k\pi + \frac{5\pi}{4}$

الف) $\cos\left(\frac{\pi}{2} + x\right) \cos\left(x - \frac{\pi}{2}\right) = \frac{1}{2}$ $-\sin x \cos x = \frac{1}{2}$ $-\frac{1}{2} \sin 2x = \frac{1}{2}$ $\sin 2x = -1$ $2x = 2k\pi + \frac{3\pi}{2}$ $x = k\pi + \frac{3\pi}{4}$ $x = k\pi + \frac{7\pi}{4}$ $\alpha = k\pi + \frac{3\pi}{4}$ $\alpha = k\pi + \frac{7\pi}{4}$

ب) $\cos\left(2x - \frac{\pi}{4}\right) = -\sin 2x \sin -2x = \cos\left(\frac{\pi}{2} + 2x\right)$ $\cos\left(2x - \frac{\pi}{4}\right) = \cos\left(\frac{\pi}{2} + 2x\right)$ $2x - \frac{\pi}{4} = 2k\pi + \frac{\pi}{2} + 2x$ $-\frac{\pi}{4} = 2k\pi + \frac{\pi}{2}$ $2k\pi = -\frac{3\pi}{4}$ $k = -\frac{3}{8}$ $\alpha = k\pi + \frac{\pi}{2}$ $\alpha = k\pi - \frac{\pi}{2}$

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ب) $\cos\left(2x - \frac{\pi}{4}\right) = -\sin 2x \sin -2x = \cos\left(\frac{\pi}{2} + 2x\right)$ $\cos\left(2x - \frac{\pi}{4}\right) = \cos\left(\frac{\pi}{2} + 2x\right)$ $2x - \frac{\pi}{4} = 2k\pi + \frac{\pi}{2} + 2x$ $-\frac{\pi}{4} = 2k\pi + \frac{\pi}{2}$ $2k\pi = -\frac{3\pi}{4}$ $k = -\frac{3}{8}$ $\alpha = k\pi + \frac{\pi}{2}$ $\alpha = k\pi - \frac{\pi}{2}$

الف) $\cos\left(\frac{\pi}{2} + x\right) \cos\left(x - \frac{\pi}{2}\right) = \frac{1}{2}$ $-\sin x \cos x = \frac{1}{2}$ $-\frac{1}{2} \sin 2x = \frac{1}{2}$ $\sin 2x = -1$ $2x = 2k\pi + \frac{3\pi}{2}$ $x = k\pi + \frac{3\pi}{4}$ $x = k\pi + \frac{7\pi}{4}$ $\alpha = k\pi + \frac{3\pi}{4}$ $\alpha = k\pi + \frac{7\pi}{4}$

ب) $\cos\left(2x - \frac{\pi}{4}\right) = -\sin 2x \sin -2x = \cos\left(\frac{\pi}{2} + 2x\right)$ $\cos\left(2x - \frac{\pi}{4}\right) = \cos\left(\frac{\pi}{2} + 2x\right)$ $2x - \frac{\pi}{4} = 2k\pi + \frac{\pi}{2} + 2x$ $-\frac{\pi}{4} = 2k\pi + \frac{\pi}{2}$ $2k\pi = -\frac{3\pi}{4}$ $k = -\frac{3}{8}$ $\alpha = k\pi + \frac{\pi}{2}$ $\alpha = k\pi - \frac{\pi}{2}$

الف) $\sin^2 x - \cos^2 x = 1$ $-\cos 2x = 1$ $\cos 2x = -1$ $2x = 2k\pi + \pi$ $x = k\pi + \frac{\pi}{2}$ $\alpha = k\pi + \frac{\pi}{2}$ $\alpha = k\pi - \frac{\pi}{2}$

ب) $\sin^2 x - \cos^2 x = -1$ $-\cos 2x = -1$ $\cos 2x = 1$ $2x = 2k\pi$ $x = k\pi$ $\alpha = k\pi$ $\alpha = k\pi$