$$\sin^4(x) - \cos^4(x) = -\frac{\sqrt{3}}{2}$$

$$(\sin^2(x) - \cos^2(x))(\sin^2(x) + \cos^2(x)) + \cos(\frac{\pi}{6}) = 0$$

$$\sin^2(x) - \cos^2(x) = -\frac{\sqrt{3}}{2}$$

$$\cos(2x) = \frac{\pi}{6} + 2k\pi$$

$$2x = \tfrac{\pi}{6} + 2k\pi \quad \vee \quad 2x = -\tfrac{\pi}{6} + 2k\pi$$

$$x = \tfrac{\pi}{12} + k\pi \quad \vee \quad x = -\tfrac{\pi}{12} + k\pi$$