

$$\sqrt{3}(\cos x + \sqrt{3}\sin x - 2) = \cos(x/2) + \sqrt{3}/2$$

$$0 \leq \cos(x/2) + \sqrt{3}/2$$

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

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

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

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

$$\cos(x/2)(2\cos(x/2) + 2\sqrt{3}\sin(x/2) - \sqrt{3} - \cos^2(x/2)) - 3 - 3/4 = 0$$

$$\cos(x/2)(\cos(x/2) + 2\sqrt{3}\sin(x/2) - \sqrt{3}) - 3 - 3/4 = 0$$

$$\cos(x/2)(\cos(x/2) + 2\sqrt{3}\sin(x/2) - \sqrt{3}) - 3 - 3/4 = 0$$

$$\cos x + \sqrt{3}\sin x - 2 \geq 0$$

$$1 \cdot \cos x + \sqrt{3}\sin x \geq 2$$

$$2(\cos x \sin a + \sin x \cos a) \geq 2$$

$$\sin a = 1/2$$

$$\cos a = \sqrt{3}/2$$

$$a = \pi/6$$

$$\cos x \sin(\pi/6) + \sin x \cos(\pi/6) \geq 1$$

$$\sin(x + \pi/6) \geq 1$$

$$\sin(x + \pi/6) = 1$$

$$x + \pi/6 = \pi/2 + 2\pi k$$

$$x = \pi/3 + 2\pi k$$

$$\sqrt{a} = b \iff \begin{cases} b \geq 0 \\ a = b^2 \\ a \geq 0 \end{cases}$$

$$\cos(x/2) + \sqrt{3}/2 = 0$$

$$\cos(x/2) = -\sqrt{3}/2$$

$$x/2 = \pm 5\pi/6 + 2\pi n$$

$$x = \pm 5\pi/3 + 4\pi n$$

$$5\pi/3 + 4\pi n = \pi/3 + 2\pi k$$

$$4\pi n - 2\pi k = -4\pi/3$$

$$12n - 6k = -4$$

$$6n - 3k = -2$$

НОД=3 Нет решений

$$-5\pi/3 + 4\pi n = \pi/3 + 2\pi k$$

$$-2 = 2k - 4n$$

$$k - 2n = -1$$

$$\text{НОД}=1$$

$$k_0 = 1$$

$$n_0 = 1$$

$$k = 1 - 2t$$

$$n = 1 - t$$

Проверка

$$1 - 2t - 2 + 2t = -1$$

Ответ: $7\pi/3 - 4\pi t$