

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

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

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

$$\cos x + \sqrt{3}\sin x = 2$$

$$\cos x + \sqrt{3}\sin x = \sqrt{4}[\sin x \cdot \sqrt{3}/2 + \cos x \cdot 1/2] = 2(\sin x \cos t + \cos x \sin t) = 2\sin(x+t)$$

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

$$\sin t = 1/2$$

$$t = \pi/6$$

$$2\sin(x + \pi/6) = 2$$

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

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

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

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

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

$$1 + 6k = 5 + 12n$$

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

$$6n - 3k = -2 \text{ нет решений}$$

$$-5 + 12n = 1 + 6k$$

$$12n - 6k = 6$$

$$2n - k = 1$$

$$n_0 = 1 \quad k_0 = 1$$

$$n = 1 - t$$

$$k = 1 - 2t$$

$$x = \pi/3 + 2\pi k = \pi/3 + 2\pi - 4\pi t = 7\pi/3 - 4\pi t$$

Ответ:  $7\pi/3 - 4\pi t$