

25.

$$\tan\left(\frac{\pi}{4} + x\right) = 3 \tan\left(\frac{\pi}{4} - x\right)$$

$$\frac{\tan\frac{\pi}{4} + \tan x}{1 - \tan\frac{\pi}{4} \tan x} = 3 \frac{\tan\frac{\pi}{4} - \tan x}{1 + \tan\frac{\pi}{4} \tan x}$$

$$\frac{1 + \tan x}{1 - \tan x} = 3 \frac{1 - \tan x}{1 + \tan x}$$

$$(1 + \tan x)^2 = 3(1 - \tan x)^2$$

$$1 + 2\tan x + \tan^2 x = 3(1 - 2\tan x + \tan^2 x)$$

$$1 + 2\tan x + \tan^2 x = 3 - 6\tan x + 3\tan^2 x$$

$$2\tan^2 x - 8\tan x + 2 = 0$$

$$\tan^2 x - 4\tan x + 1 = 0$$

$$\tan x = \frac{4 \pm \sqrt{16 - 4}}{2}$$

$$\tan x = \frac{4 \pm 2\sqrt{3}}{2}$$

$$\tan x = 2 \pm \sqrt{3}$$

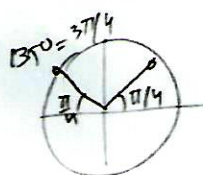
$$\tan x = 2 + \sqrt{3} \text{ ou } 2 - \sqrt{3}$$

(Há 2 valores possíveis)

26.

$$a) \cos\left(\frac{3\pi}{4} + x\right) + \sin\left(\frac{3\pi}{4} - x\right) =$$

$$\cos\left(\frac{3\pi}{4} + x\right) = \cos\frac{3\pi}{4} \cos x - \sin\frac{3\pi}{4} \sin x$$



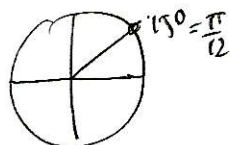
$$= -\frac{\sqrt{2}}{2} \cos x - \frac{\sqrt{2}}{2} \sin x$$

$$\begin{aligned} \sin\left(\frac{3\pi}{4} - x\right) &= \sin\frac{3\pi}{4} \cos x - \cos\frac{3\pi}{4} \sin x \\ &= \frac{\sqrt{2}}{2} \cos x - \sin x \left(-\frac{\sqrt{2}}{2}\right) \\ &= \frac{\sqrt{2}}{2} \cos x + \frac{\sqrt{2}}{2} \sin x \end{aligned}$$

$$\cos\left(\frac{3\pi}{4} + x\right) + \sin\left(\frac{3\pi}{4} - x\right) = 0$$

$$b) \cos\left(\frac{\pi}{12} - x\right) =$$

$$= \cos\frac{\pi}{12} \cos x + \sin\frac{\pi}{12} \sin x$$



$$\cos\frac{\pi}{12} = \cos\left(\frac{\pi}{4} - \frac{\pi}{6}\right)$$

$$= \cos\frac{\pi}{4} \cos\frac{\pi}{6} + \sin\frac{\pi}{4} \sin\frac{\pi}{6}$$

$$= \frac{\sqrt{2}}{2} \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \frac{1}{2}$$

$$= \frac{\sqrt{2}}{4} (\sqrt{3} + 1)$$

$$\sin\frac{\pi}{12} = \sin\left(\frac{\pi}{4} - \frac{\pi}{6}\right) =$$

$$= \sin\frac{\pi}{4} \cos\frac{\pi}{6} - \cos\frac{\pi}{4} \sin\frac{\pi}{6}$$

$$= \frac{\sqrt{2}}{2} \frac{\sqrt{3}}{2} - \frac{1}{2} \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{4} (\sqrt{3} - 1)$$