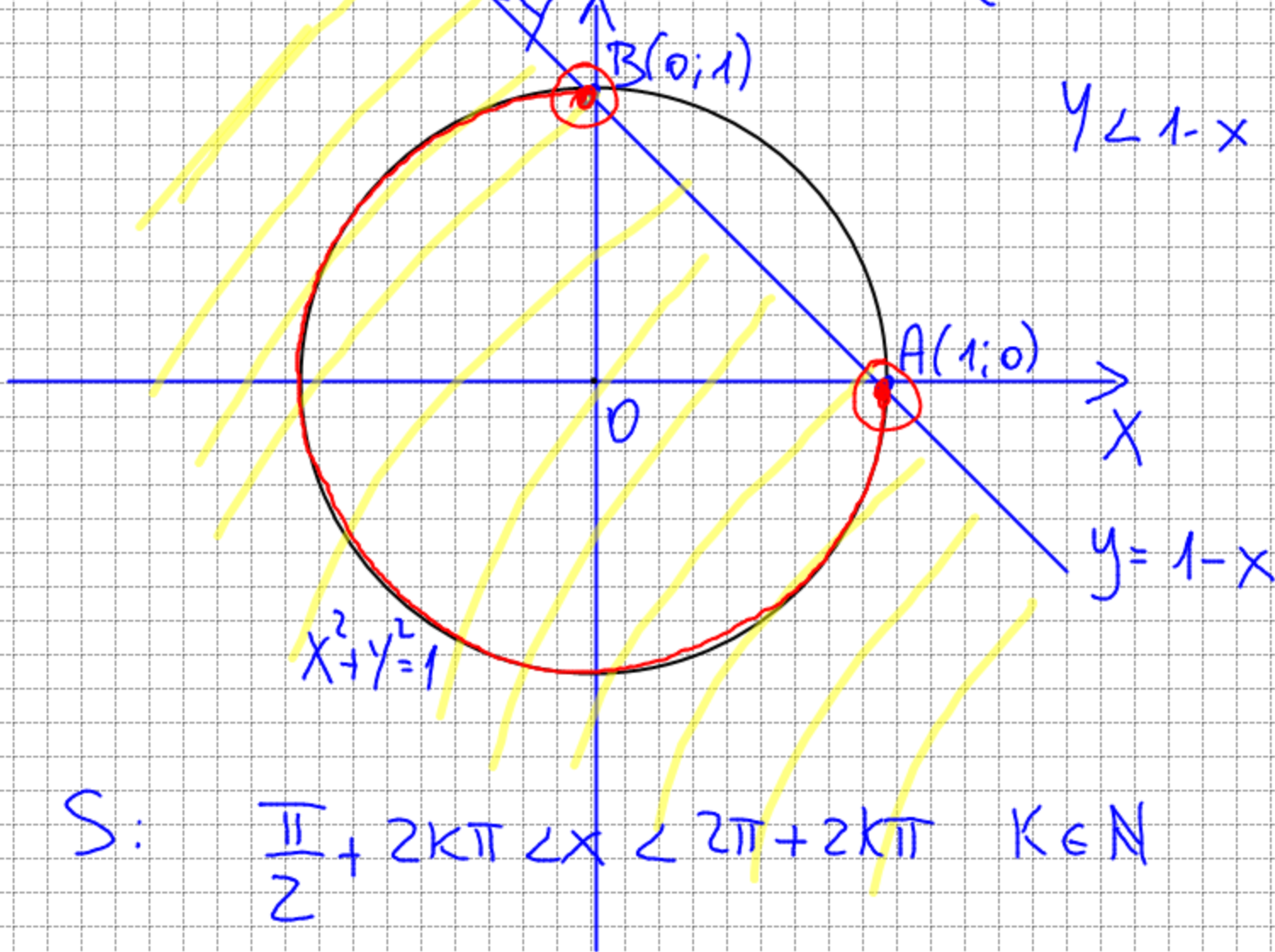


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$$\cos x + \sin x - 1 < 0$$

$$\begin{cases} \cos x = X \\ \sin x = Y \end{cases} \quad \begin{cases} X + Y - 1 < 0 \\ X^2 + Y^2 = 1 \end{cases} \quad \begin{cases} Y < 1 - X \\ X^2 + Y^2 = 1 \end{cases}$$

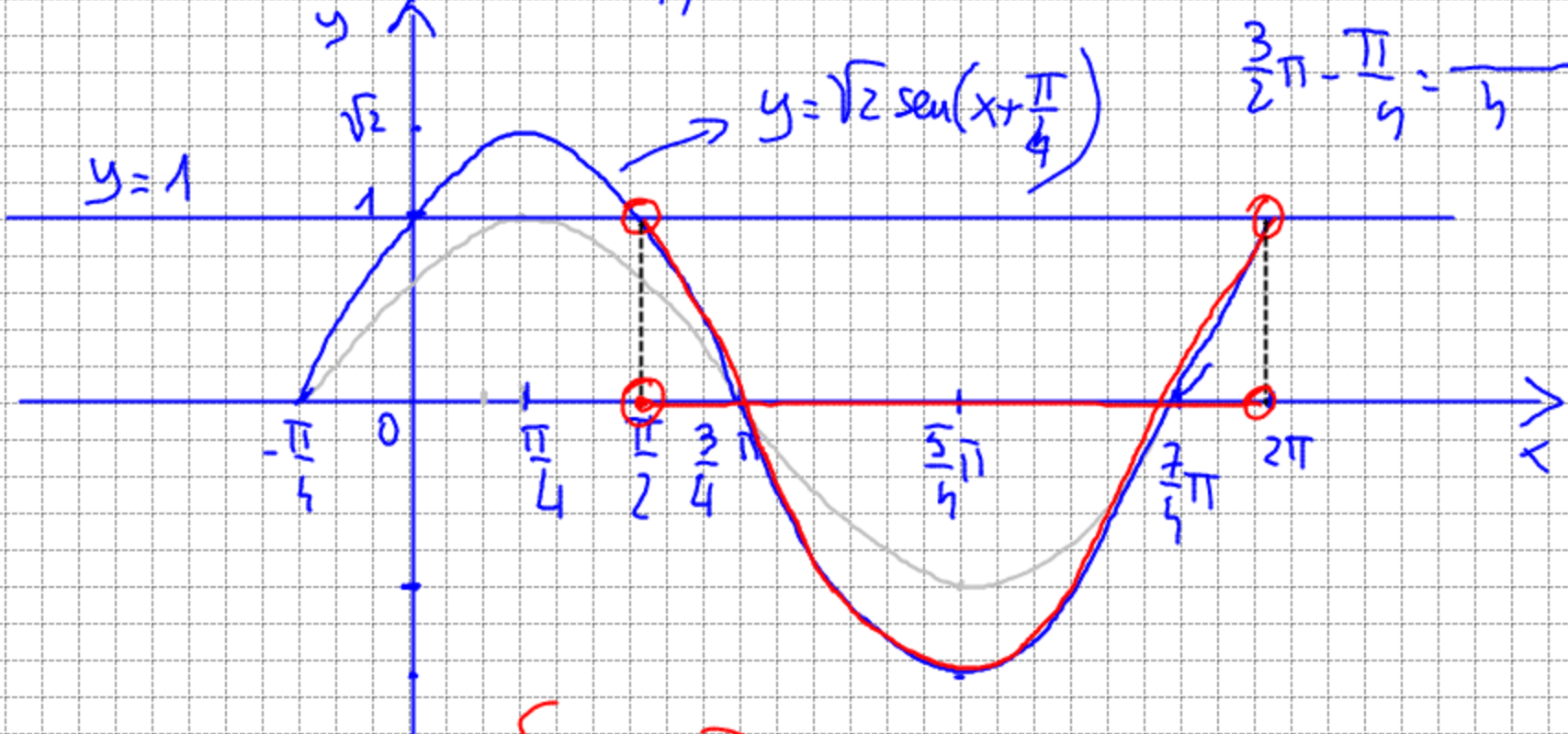


• $\cos x + \sin x - 1 < 0$

$$\sqrt{a^2 + b^2} = \sqrt{2} \quad \cos x + \sin x = \sqrt{2} \left(\frac{\sqrt{2}}{2} \cos x + \frac{\sqrt{2}}{2} \sin x \right) = \sqrt{2} \sin \left(x + \frac{\pi}{4} \right)$$

$$\rightarrow \sqrt{2} \sin \left(x + \frac{\pi}{4} \right) - 1 < 0 \quad \sqrt{2} \sin \left(x + \frac{\pi}{4} \right) < 1$$

$$\begin{cases} y = \sqrt{2} \sin \left(x + \frac{\pi}{4} \right) \\ y = 1 \\ \sqrt{2} \sin \left(x + \frac{\pi}{4} \right) < 1 \end{cases}$$



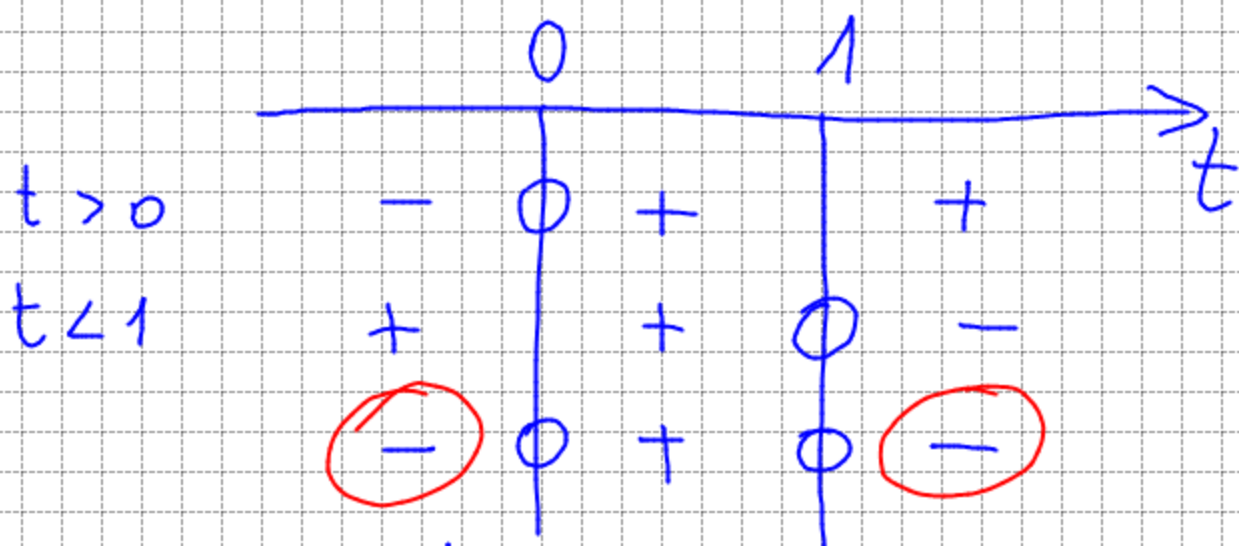
$$S: \frac{\pi}{2} + 2k\pi < x < 2\pi + 2k\pi$$

$$\cos x + \sin x - 1 < 0$$

$$\begin{cases} \sin x = \frac{2t}{1+t^2} \\ \cos x = \frac{1-t^2}{1+t^2} \end{cases} \quad \begin{cases} \tan \frac{x}{2} = t \\ \cos \frac{x}{2} \neq 0 \quad \frac{x}{2} \neq \frac{\pi}{2} + k\pi \quad k \in \mathbb{N} \\ x \neq \pi + 2k\pi \quad k \in \mathbb{N} \end{cases}$$

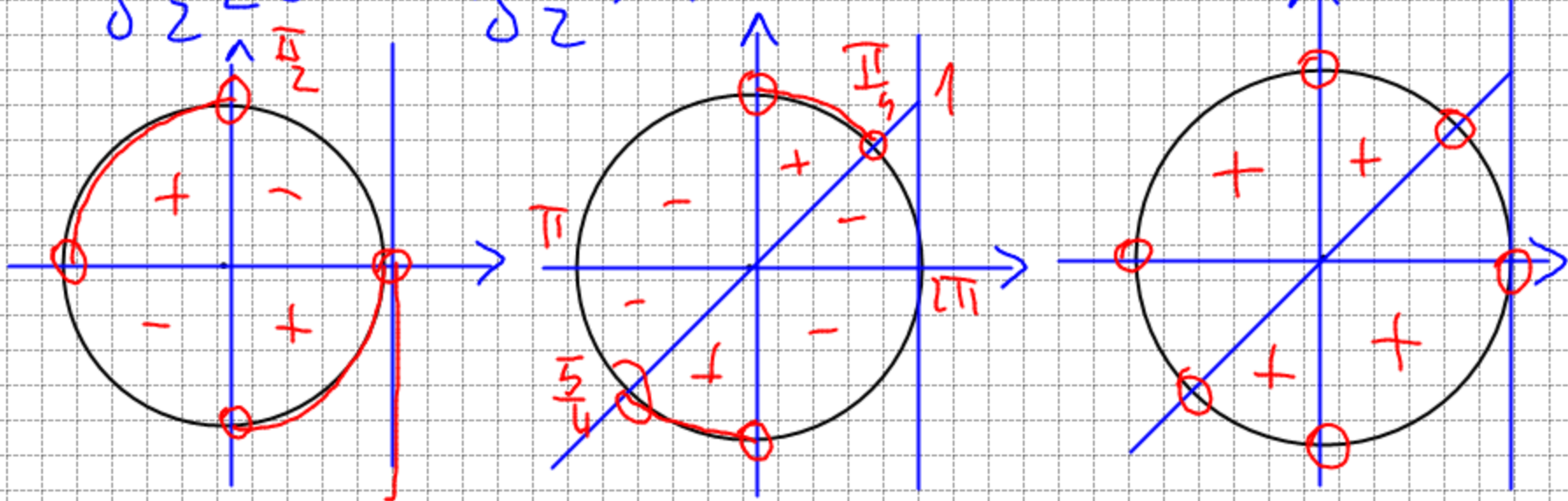
$$\frac{1-t^2}{1+t^2} + \frac{2t}{1+t^2} - \frac{1+t^2}{1+t^2} < 0 \quad \cancel{1-t^2} + 2t - \cancel{1-t^2} < 0$$

$$-2t^2 + 2t < 0 \quad 2t(-t+1) < 0 \quad \begin{matrix} \nearrow 2t > 0 \quad t > 0 \\ \searrow -t+1 > 0 \quad t < 1 \end{matrix}$$



$t < 0 \cup t > 1$

$$\tan \frac{x}{2} < 0 \cup \tan \frac{x}{2} > 1$$



$$\frac{\pi}{4} + k\pi < \frac{x}{2} < \pi + k\pi \quad k \in \mathbb{N}$$

$$\frac{\pi}{2} + 2k\pi < x < 2\pi + 2k\pi \quad k \in \mathbb{N}$$