ES 77 PAG 186

$I.\ [-\pi, \pi]$

$f(x) = \operatorname{sen} x + \cos x \qquad g(x) = \operatorname{sen} x - \cos x$

$$f(x) = \sqrt{2}\left(\frac{1}{\sqrt{2}}\operatorname{sen} x + \frac{1}{\sqrt{2}}\cos x\right)$$

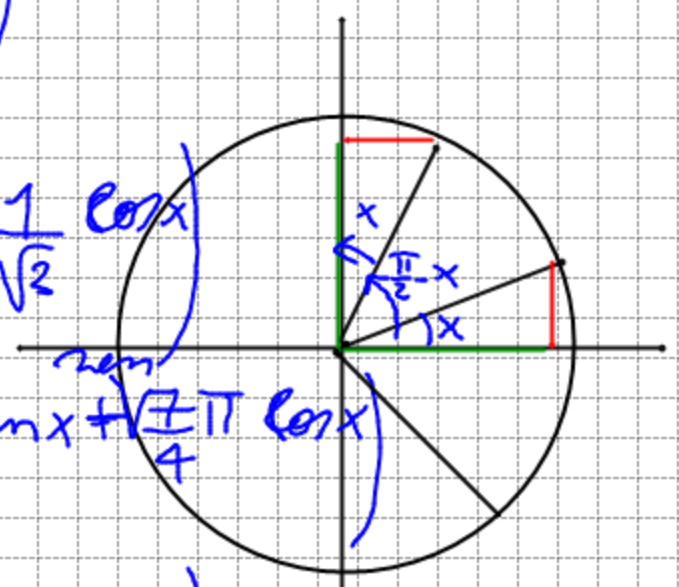
$$f(x) = \sqrt{2}\left(\cos\frac{\pi}{4}\operatorname{sen} x + \operatorname{sen}\frac{\pi}{4}\cos x\right)$$

$$f(x) = \sqrt{2}\operatorname{sen}\left(x + \frac{\pi}{4}\right)$$

$$g(x) = \operatorname{sen} x - \cos x$$

$$g(x) = \sqrt{2}\left(\frac{1}{\sqrt{2}}\operatorname{sen} x - \frac{1}{\sqrt{2}}\cos x\right)$$

$$g(x) = \sqrt{2}\left(\cos\frac{7\pi}{4}\operatorname{sen} x + \operatorname{sen}\frac{7}{4}\pi\cos x\right)$$



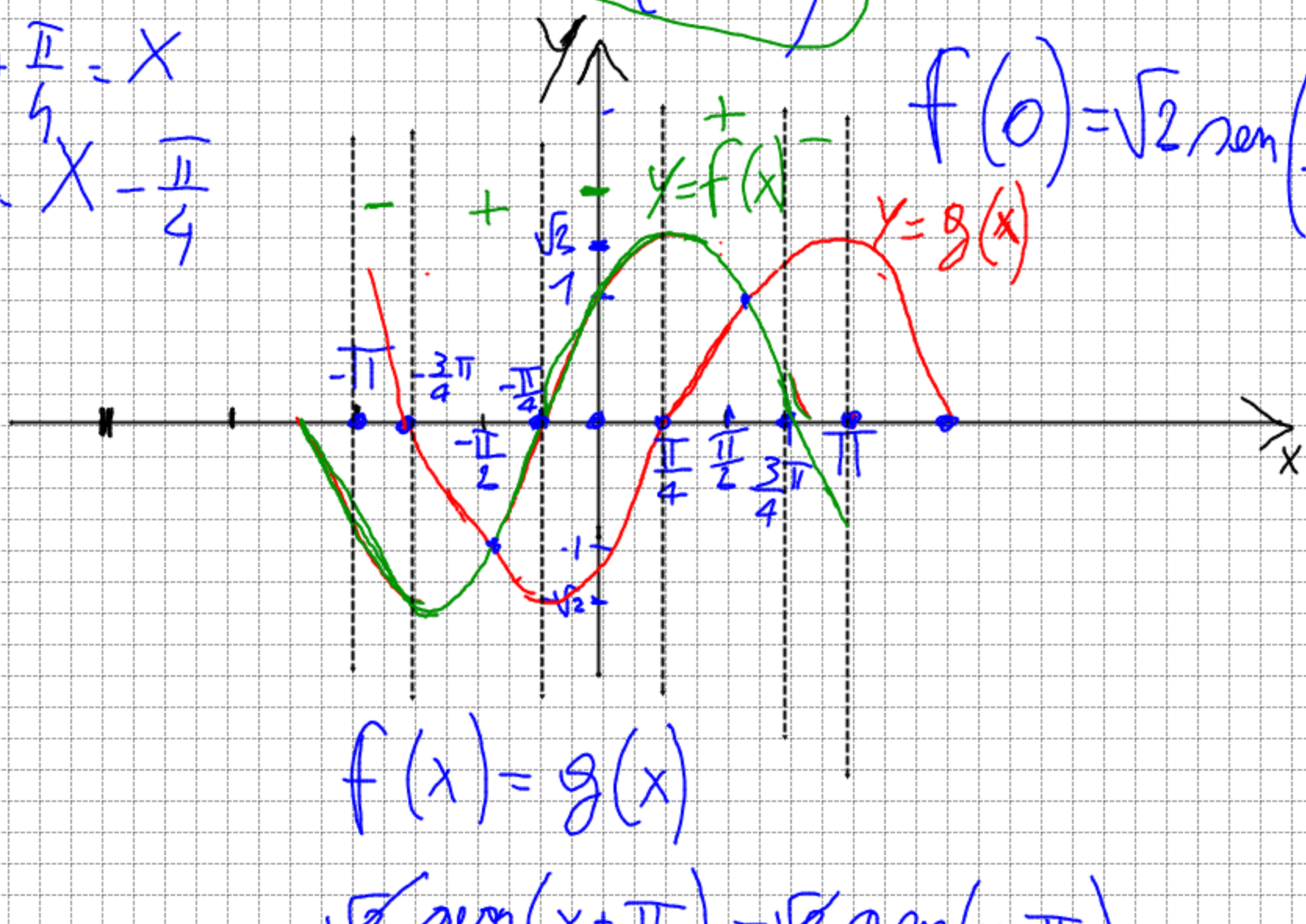
$$g(x) = \sqrt{2}\operatorname{sen}\left(x + \frac{7}{4}\pi\right) = \sqrt{2}\operatorname{sen}\left(x - \frac{\pi}{4}\right)$$

$$\boxed{f(x) = \sqrt{2}\operatorname{sen}\left(x + \frac{\pi}{4}\right)}$$

$x + \frac{\pi}{4} = X$

$x = X - \frac{\pi}{4}$

$f(0) = \sqrt{2}\operatorname{sen}\left(\frac{\pi}{4}\right)$



$$f(x) = g(x)$$

$$\sqrt{2}\operatorname{sen}\left(x + \frac{\pi}{4}\right) = \sqrt{2}\operatorname{sen}\left(x - \frac{\pi}{4}\right)$$

$$\begin{cases} x + \frac{\pi}{4} = x - \frac{\pi}{4} + 2k\pi & k \in \mathbb{N} \\ x + \frac{\pi}{4} = \pi - \left(x - \frac{\pi}{4}\right) + 2k\pi & k \in \mathbb{N} \end{cases}$$

$$x + \frac{\pi}{4} = \pi - x + \frac{\pi}{4} + 2k\pi \qquad k \in \mathbb{N}$$

$$2x = \pi + 2k\pi \qquad k \in \mathbb{N}$$

$$x = \frac{\pi}{2} + k\pi \qquad k \in \mathbb{N}$$

$$f(x) \geq g(x)$$

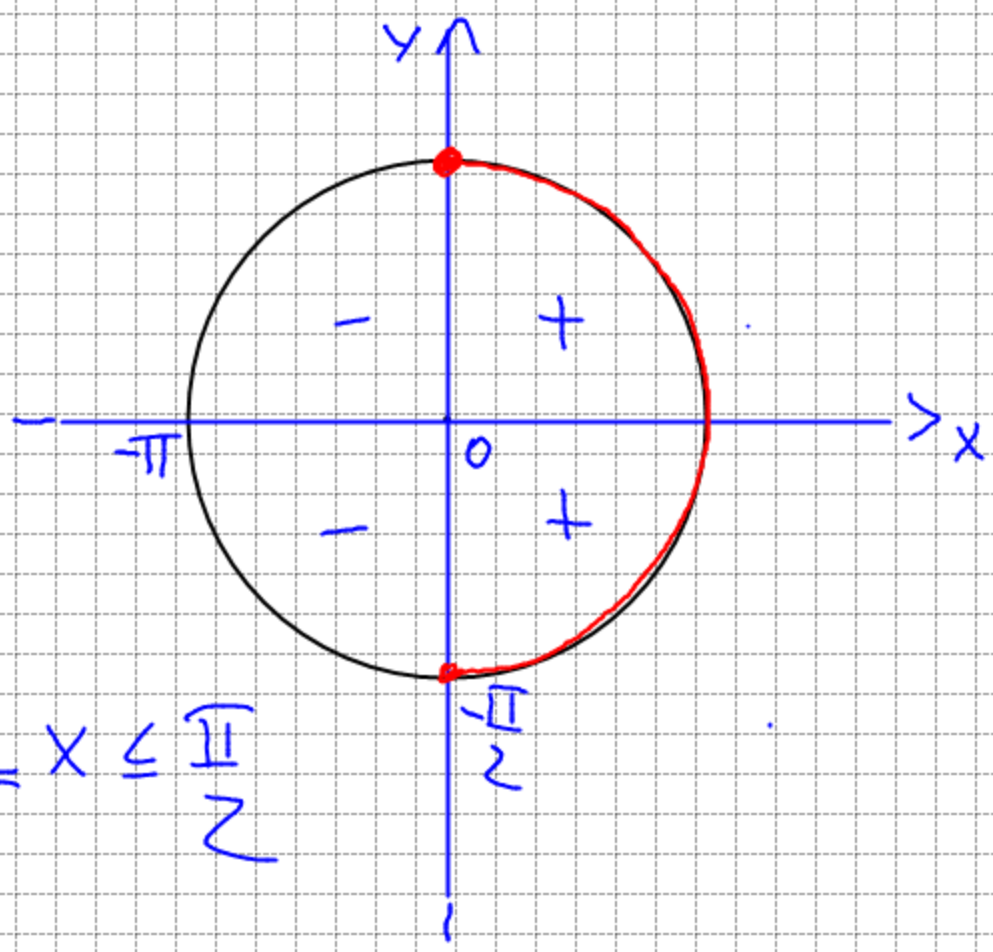
$$\sqrt{2}\,\operatorname{sen}\left(x+\frac{\pi}{4}\right) \geq \sqrt{2}\,\operatorname{sen}\left(x-\frac{\pi}{4}\right)$$

$$\operatorname{sen}x\cos\frac{\pi}{4}+\cos x\operatorname{sen}\frac{\pi}{4} \geq \operatorname{sen}x\cos\frac{\pi}{4}-\cos x\operatorname{sen}\frac{\pi}{4}$$

$$+2\cos x\operatorname{sen}\frac{\pi}{4} \geq 0$$

$$\sqrt{2}\cos x \geq 0$$

$$\cos x \geq 0$$



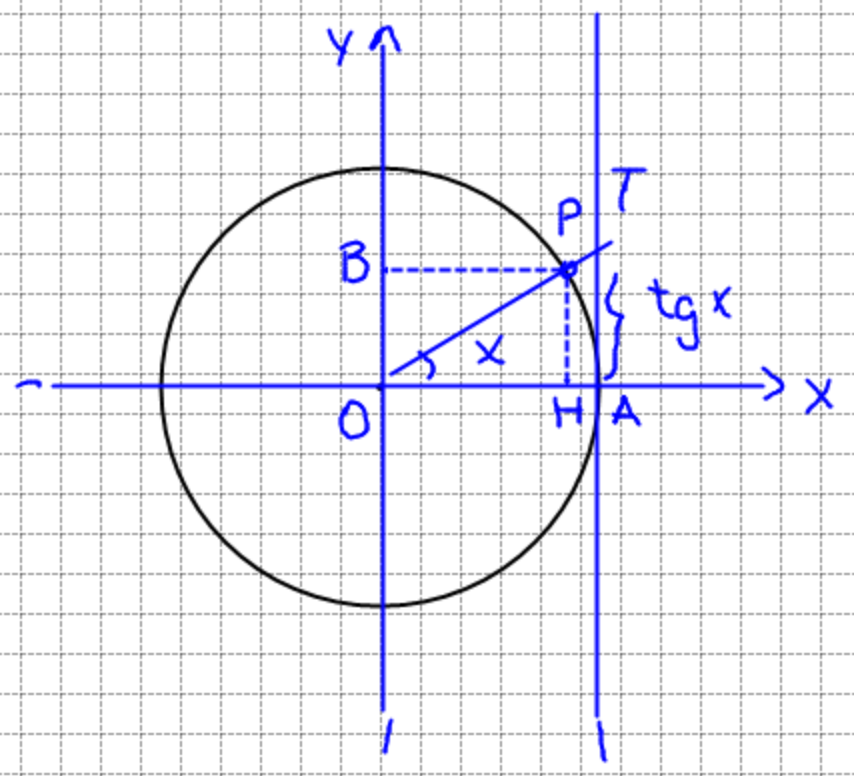
$$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$

$$I = \left[-\frac{\pi}{2}; \frac{\pi}{2}\right]$$

$$f(x) = f(x)\cdot g(x)$$

$$\therefore$$

$y = \operatorname{tg} x$



$$\operatorname{tg} x = \frac{\operatorname{sen} x}{\cos x}$$

$$P\hat{O}H \sim O\hat{A}T$$

$$\overline{AT} : \overline{OA} = \overline{HP} : \overline{OH}$$

$$\operatorname{tg} x : 1 = \operatorname{sen} x : \cos x$$

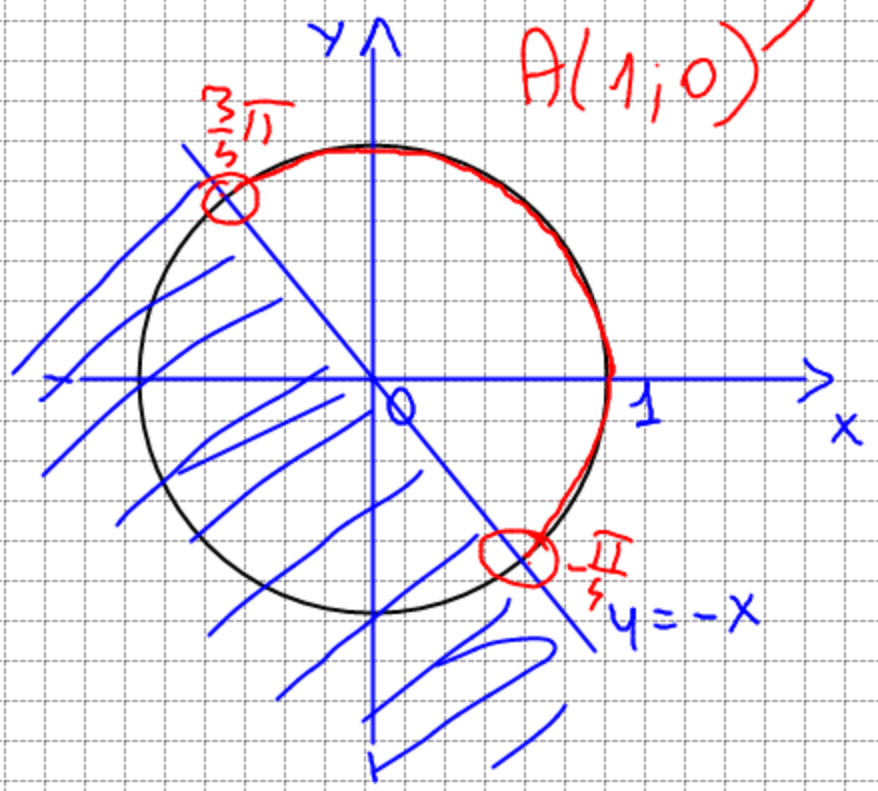
$$\operatorname{tg} x = \frac{\operatorname{sen} x}{\cos x}$$

$$\operatorname{sen} x > -\cos x$$

$$\operatorname{sen} x + \cos x > 0$$

$$\begin{cases} \cos x = X \\ \operatorname{sen} x = Y \end{cases} \cup \begin{cases} X^2 + Y^2 = 1 \\ Y + X > 0 \end{cases} \Rightarrow \begin{cases} X^2 + Y^2 = 1 \\ Y > -X \end{cases}$$

$A(1;0)$ $\quad 0 + 1 > 0 \quad 1 > 0$ ✓



$$-\frac{\pi}{4} + 2k\pi < x < \frac{\pi}{4} + 2k\pi$$