N 78 PAG 186

$I = \left[-\frac{\pi}{2}; \frac{3}{2}\pi\right]$ $\qquad f(x) = \sqrt{3}\,\text{sen}\,x + \cos x$

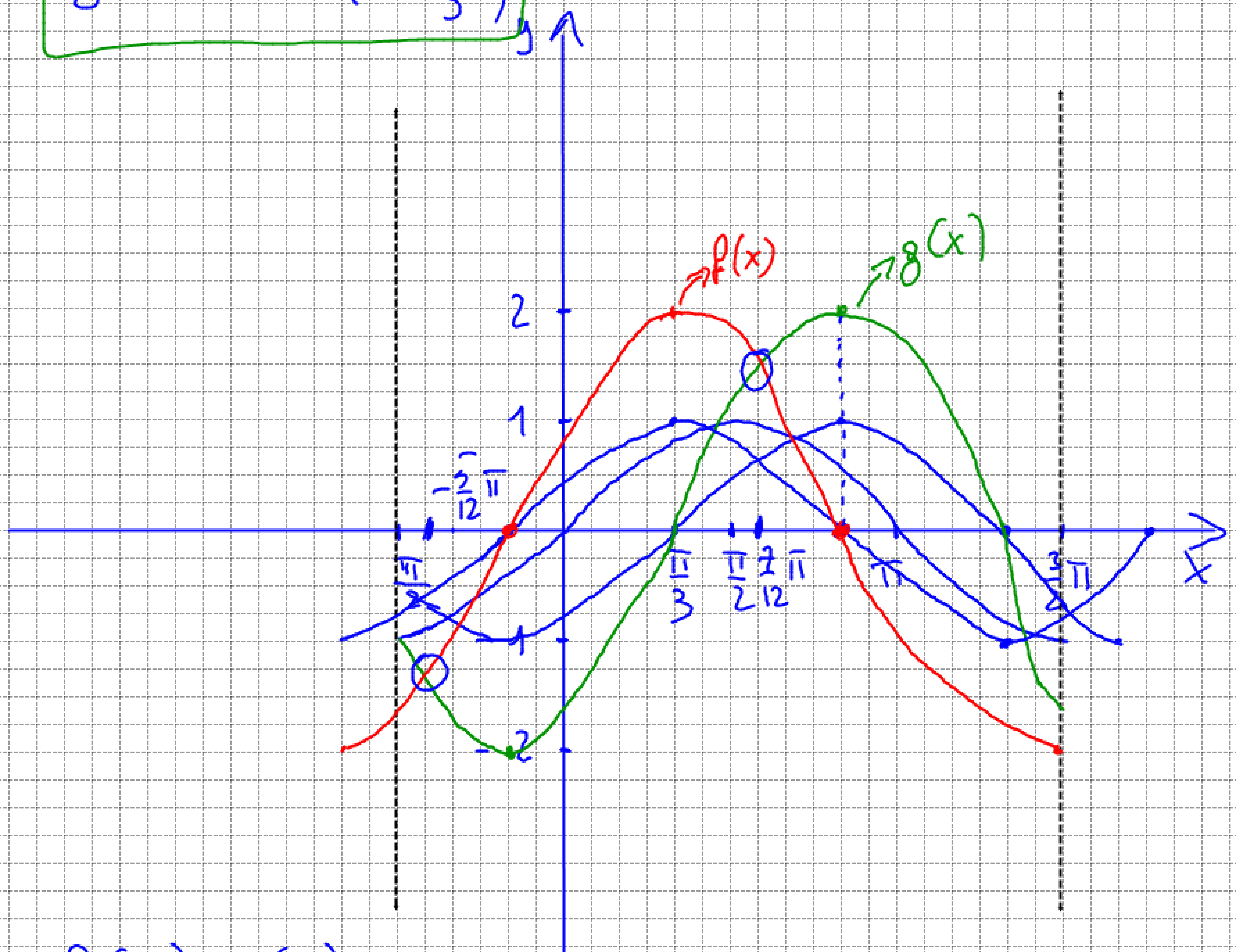
$g(x) = \text{sen}\,x - \sqrt{3}\cos x$

$f(x) = 2\left(\frac{\sqrt{3}}{2}\text{sen}\,x + \frac{1}{2}\cos x\right)$

$f(x) = 2\,\text{sen}\left(x + \frac{\pi}{6}\right)$

$g(x) = 2\left(\frac{1}{2}\text{sen}\,x - \frac{\sqrt{3}}{2}\cos x\right)$ $\qquad \cos\alpha = \frac{1}{2}$, $\text{sen}\,\alpha = -\frac{\sqrt{3}}{2}$ $\quad -\frac{\pi}{3}$

$g(x) = 2\,\text{sen}\left(x - \frac{\pi}{3}\right)$



$f(x) = g(x)$

$2\,\text{sen}\left(x + \frac{\pi}{6}\right) = 2\,\text{sen}\left(x - \frac{\pi}{3}\right)$

$x + \frac{\pi}{6} = x - \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{N}$

$x + \frac{\pi}{6} = \pi - x + \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{Z}$

$2x = \pi - \frac{\pi}{6} + \frac{\pi}{3} + 2k\pi \quad k \in \mathbb{Z}$

$2x = \frac{7\pi}{6} + 2k\pi \quad k \in \mathbb{Z}$

$x = \frac{7\pi}{12} + k\pi \quad k \in \mathbb{Z}$

$\rightarrow x = \frac{7}{12}\pi \quad k = 0$

$\rightarrow x = \frac{7}{12}\pi - \pi \quad k = -1$

$x = -\frac{5}{12}\pi$

$-1 \le \text{sen}\,x \le 1$

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

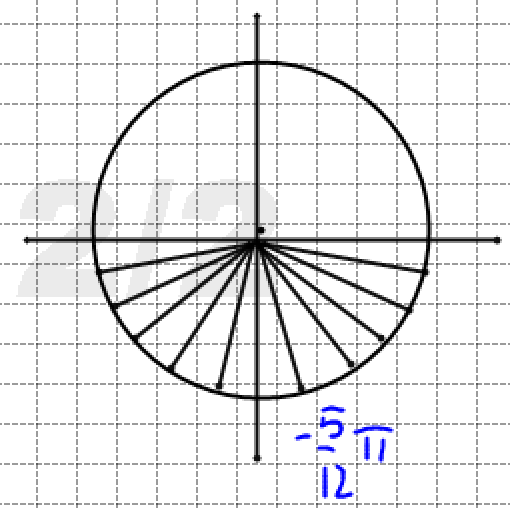
$-\frac{\pi}{2} + \frac{\pi}{6} \le x + \frac{\pi}{6} \le \frac{\pi}{2} + \frac{\pi}{6}$ $\qquad -\frac{\pi}{3} \le x + \frac{\pi}{6} \le \frac{2}{3}\pi$

$-1 \le \text{sen}\left(x + \frac{\pi}{6}\right) \le 1$

$-2 \le 2\,\text{sen}\left(x + \frac{\pi}{6}\right) \le 2$

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

$$-\frac{5}{12}\pi \leq x \leq \frac{7}{12}\pi$$



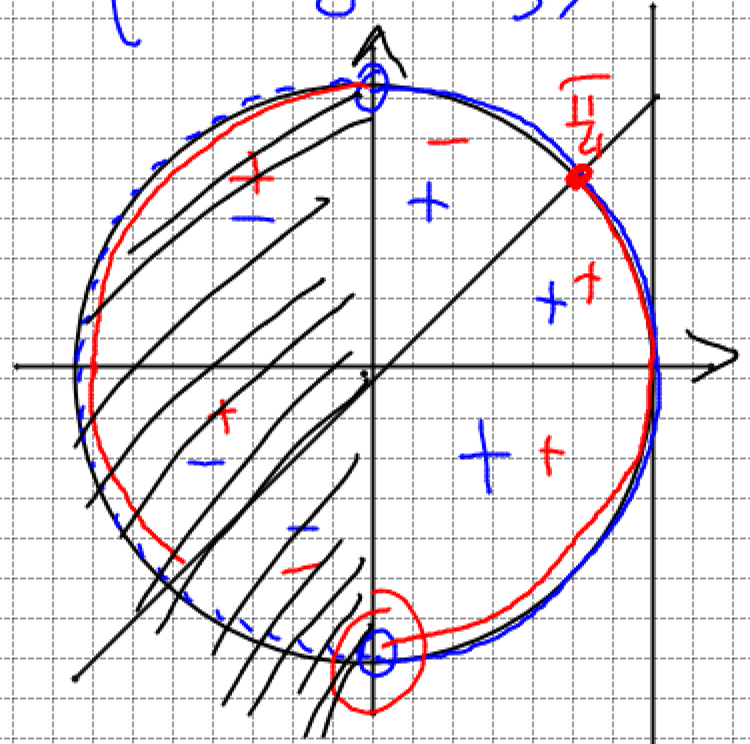
$$\cancel{2}\,\text{sen}\left(x+\frac{\pi}{6}\right) \geq \cancel{2}\,\text{sen}\left(x-\frac{\pi}{3}\right)$$

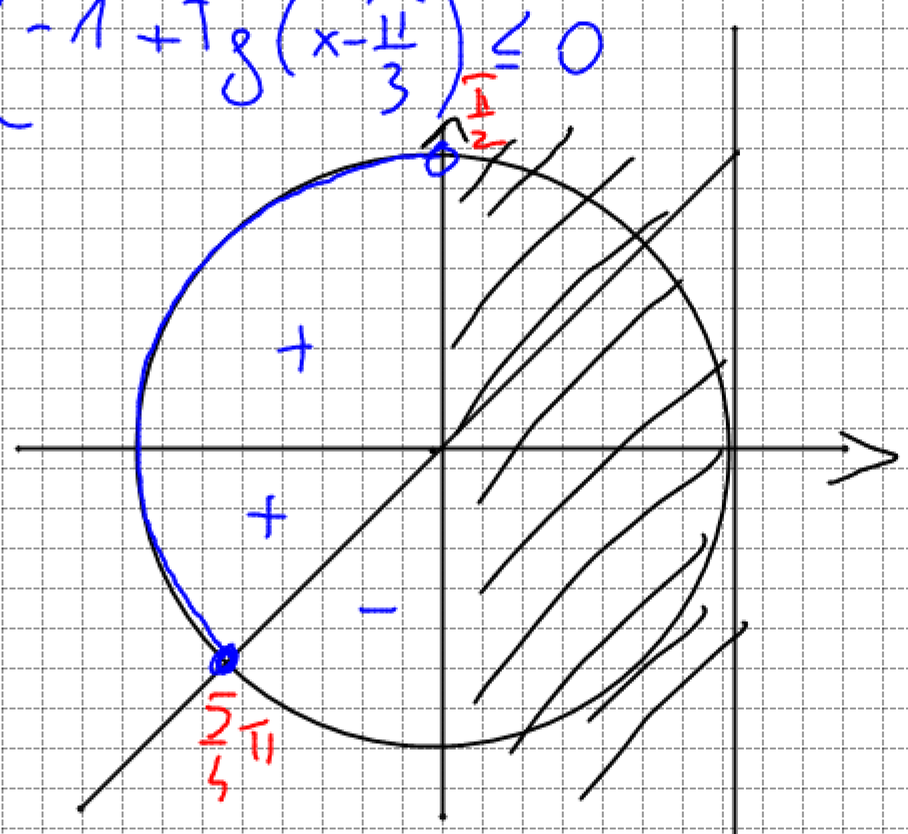
$$\text{sen}\left(x+\frac{\pi}{6}\right) - \text{sen}\left(x-\frac{\pi}{3}\right) \geq 0$$

$$\cos\left(x-\frac{\pi}{3}\right) = \text{sen}\left(\frac{\pi}{2}+x-\frac{\pi}{3}\right) = \text{sen}\left(\frac{\pi}{6}+x\right)$$

$$\boxed{\cos\left(x-\frac{\pi}{3}\right) - \text{sen}\left(x-\frac{\pi}{3}\right) \geq 0}$$

$$\begin{cases} \cos\left(x-\frac{\pi}{3}\right) > 0 \\ 1 - \text{Tg}\left(x-\frac{\pi}{3}\right) \geq 0 \end{cases} \cup \begin{cases} \cos\left(x-\frac{\pi}{3}\right) < 0 \\ -1 + \text{Tg}\left(x-\frac{\pi}{3}\right) \leq 0 \end{cases}$$





$$-\frac{\pi}{2} < x - \frac{\pi}{3} \leq \frac{\pi}{4} \quad \cup \quad \frac{\pi}{2} < x - \frac{\pi}{3} \leq \frac{5}{4}\pi$$

$$\frac{\pi}{3} - \frac{\pi}{2} < x \leq \frac{\pi}{3} + \frac{\pi}{4} \qquad \frac{\pi}{2} + \frac{\pi}{3} < x \leq \frac{\pi}{3} + \frac{5}{4}\pi$$

$$-\frac{\pi}{6} < x \leq \frac{7}{12}\pi \quad \cup \quad \frac{5}{6}\pi < x \leq \frac{19}{12}\pi$$

$$\begin{cases} \cos\left(x-\frac{\pi}{3}\right) + \text{sen}\left(x-\frac{\pi}{3}\right) \geq 0 \quad y \geq -x \\ \text{sen}^2\left(x-\frac{\pi}{3}\right) + \cos^2\left(x-\frac{\pi}{3}\right) = 1 \end{cases}$$