DISEQUAZIONI TRIGONOMETRICHE

ESERCIZI

1) a) $\sin x < -\frac{1}{2}$ $\quad S = \left]\frac{7}{6}\pi, \frac{11}{6}\pi\right[$

b) $\tan x > \sqrt{3}$ $\quad S = \left]\frac{\pi}{3}, \frac{\pi}{2}\right[\cup \left]\frac{4}{3}\pi, \frac{3}{2}\pi\right[$

c) $|\cos x| \geq \frac{\sqrt{3}}{2}$ $\quad S = \left[0, \frac{\pi}{6}\right] \cup \left[\frac{5}{6}\pi, \frac{7}{6}\pi\right] \cup \left[\frac{11}{6}\pi, 2\pi\right]$

d) $\cos x > \frac{\sqrt{2}}{2}$ $\quad S = \left[0, \frac{\pi}{4}\right[\cup \left]\frac{7}{4}\pi, 2\pi\right]$

e) $|\sin x| < \frac{1}{2}$ $\quad S = \left[0, \frac{\pi}{6}\right[\cup \left]\frac{5}{6}\pi, \frac{7}{6}\pi\right[\cup \left]\frac{11}{6}\pi, 2\pi\right]$

f) $\cos x > -\frac{1}{2}$ $\quad S = \left[0, \frac{2\pi}{3}\right[\cup \left]\frac{4}{3}\pi, 2\pi\right]$

g) $\tan x > 0$ $\quad S = \left]0, \frac{\pi}{2}\right[\cup \left]\pi, \frac{3}{2}\pi\right[$

h) $|\tan x| > -1$ $\quad S = \forall x \neq \frac{\pi}{2} + k\pi$ in $[0, 2\pi]$ $\quad S = \left[0, \frac{\pi}{2}\right[\cup \left]\frac{\pi}{2}, \frac{3}{2}\pi\right[\cup \left]\frac{3}{2}\pi, 2\pi\right]$

i) $\tan x \leq -\sqrt{3}$ $\quad S = \left]\frac{\pi}{2}, \frac{2}{3}\pi\right] \cup \left]\frac{3}{2}\pi, \frac{5}{3}\pi\right]$

l) $\sin x \leq \frac{5}{4}$ $\quad S: \forall x$

m) $\frac{1}{2} \leq \sin x \leq \frac{\sqrt{3}}{2}$ $\quad S = \left[\frac{\pi}{6}, \frac{\pi}{3}\right] \cup \left[\frac{2}{3}\pi, \frac{5}{6}\pi\right]$

n) $\cos x \geq -2$ $\quad S: \forall x$

o) $-\frac{\sqrt{2}}{2} < \cos x \leq \frac{\sqrt{3}}{2}$ $\quad S = \left[\frac{\pi}{6}, \frac{3}{4}\pi\right[\cup \left]\frac{5}{4}\pi, \frac{11}{6}\pi\right]$

p) $-\sqrt{3} < \tan x < 1$ $\quad S = \left[0, \frac{\pi}{4}\right[\cup \left]\frac{2}{3}\pi, \frac{5}{4}\pi\right[\cup \left]\frac{5}{3}\pi, 2\pi\right]$

q) $|\sin x| < 0$, $|\sin x| > 0$, $|\sin x| \geq 0$ $\quad S_1 = \emptyset$, $S_2 = \left]0, \pi\right[\cup \left]\pi, 2\pi\right[$, $S_3 = \forall x$

r) $\begin{cases} \sin x < \frac{1}{2} \\ \cos x < 0 \end{cases}$ $\quad S = \left]\frac{5}{6}\pi, \frac{3}{2}\pi\right[$

s) $\begin{cases} \sin x < \frac{\sqrt{2}}{2} \\ \cos x < -\frac{\sqrt{2}}{2} \end{cases}$ $\quad S = \left]\frac{3}{4}\pi, \frac{5}{4}\pi\right[$

t) $\begin{cases} \sin x > \frac{\sqrt{3}}{2} \\ \tan x > 0 \end{cases}$ $\quad S = \left]\frac{\pi}{3}, \frac{\pi}{2}\right[$

2) a) $4\cos^2 x - 1 > 0$ $\quad S = [0, \frac{\pi}{3}[\cup]\frac{2}{3}\pi, \frac{4}{3}\pi[\cup]\frac{5}{3}\pi, 2\pi]$

b) $4\sin^2 x - 3 \leq 0$ $\quad S = [0, \frac{\pi}{3}] \cup [\frac{2}{3}\pi, \frac{4}{3}\pi] \cup [\frac{5}{3}\pi, 2\pi]$

c) $\tan^2 x - 3 > 0$ $\quad S =]\frac{\pi}{3}, \frac{\pi}{2}[\cup]\frac{2}{3}\pi, \frac{4}{3}\pi[\cup]\frac{3}{2}\pi, \frac{5}{3}\pi[$

d) $2\cos^2 x - 3\cos x + 1 > 0$ $\quad S =]\frac{\pi}{3}, \frac{5}{3}\pi[$

e) $\sin^2 x - 3\sin x - 4 < 0$ $\quad S. \; x \neq \frac{3}{2}\pi$

f) $\sin^2 x - 4\sin x + 3 < 0$ $\quad S = \phi$

g) $\cos(2x) + \cos x < 0$ $\quad S =]\frac{\pi}{3}, \pi[\cup]\pi, \frac{5}{3}\pi[$

h) $\sin^2 x + \frac{5}{2}\cos x - 2 > 0$ $\quad S = [0, \frac{\pi}{3}[\cup]\frac{5}{3}\pi, 2\pi]$

i) $\sqrt{2}\sin^2 x + \sin x < 0$ $\quad S =]\pi, \frac{5}{4}\pi[$

l) $3\cos x + \sin^2 x - 3 > 0$ $\quad S = \phi$

m) $\tan^2 x - \tan x > 0$ $\quad S =]\frac{\pi}{4}, \frac{\pi}{2}[\cup]\frac{\pi}{2}, \pi[$

3) a) $3\sin x + \sqrt{3}\cos x + \sqrt{3} > 0$ $\quad S = [0, \pi[\cup]\frac{5}{3}\pi, 2\pi]$

b) $\sin x + \cos x < -1$ $\quad S' =]\pi, \frac{3}{2}\pi[$

c) $(2-\sqrt{3})\sin x + \cos x > 2 - \sqrt{3}$ $\quad S' = [0, \frac{\pi}{2}[\cup]\frac{5}{3}\pi, 2\pi]$

d) $\sin x - \sqrt{3}\cos x > 0$ $\quad S' =]\frac{\pi}{3}, \frac{4}{3}\pi[$

e) $\sqrt{2}\cos x - \sqrt{6}\sin x < 0$ $\quad S' =]\frac{\pi}{6}, \frac{7}{6}\pi[$

4) a) $\sin(2x) - \cos x < 0$ $\quad S' = [0, \frac{\pi}{6}[\cup]\frac{\pi}{2}, \frac{5}{6}\pi[\cup]\frac{3}{2}\pi, 2\pi]$

b) $(2\cos x - \sqrt{2})\tan x \geq 0$ $\quad S = [0, \frac{\pi}{4}] \cup]\frac{\pi}{2}, \pi] \cup]\frac{3}{2}\pi, \frac{7}{4}\pi] \cup \{2\pi\}$

c) $(1 - \tan x) \cdot (2\sin x + 1) < 0$ $\quad S =]\frac{\pi}{4}, \frac{\pi}{2}[\cup]\frac{7}{6}\pi, \frac{5}{4}\pi[\cup]\frac{3}{2}\pi, \frac{11}{6}\pi[$