Goniometrie (vergelijkingen & ongelijkheden)

1. Los de vergelijkingen op:

a) ★ $2\cos\left(2x+\dfrac{\pi}{4}\right)+\sqrt{3}=0$

b) ★ $\tan 2x = -\cot x$

c) ★ $\sin x.\cos x = \dfrac{1}{4}$

d) ★★ $\cos x.\cos 3x = \sin 2x.\sin 4x$

e) ★★ $\cos x + 5\sin\dfrac{x}{2} = 3$

f) ★★ $\sin 4x + 4\sin x = 8\sin^3 x$

g) ★ $5\cos^3 x - 2\cos x - 3 = 0$

h) ★★ $\tan^2 x + 1 = (3 - \sin 2x).\tan x$

i) ★★ $\sin^4 x = 3\sin^2 x.\cos^2 x + 4\cos^4 x$

j) ★★ $\sin^3 x + 2\sin x.\cos^2 x + 3\cos x = 3\cos x.\sin^2 x$

k) ★★ $\cos^4 x + \sin^4 x = \dfrac{1}{2}$

l) ★★★ $\sin x + \cos x = \dfrac{6}{\sec x + \csc x}$

m) ★★ $\sqrt{3}\cos x + \sqrt{3} = \sin x$

n) ★★★ $3\tan x = \dfrac{5}{\cos x} + 4$

o) ★★ $2\sin^2 x + \sin 2x = \cos 2x + 1$

p) ★★ $\sin^4 x + \cos^4 x = \sin x.\cos x$

q) ★★ $11\cos 2x - 7\sin 2x + 13 = 0$

r) ★★★ $\dfrac{\tan x}{\tan 2x} = \dfrac{\tan 2x}{\tan x}$

s) ★★★ $2\cos 6x = 2\left(\sqrt{3}+\sqrt{2}\right)\sin 3x + \sqrt{6} + 2$

t) ★ $2 + \cos 4x + \cos 2x = 0$

u) ★★★ $\tan 6x - \tan 5x = \dfrac{1}{2}\sin x$

v) ★★ $4\left(\cos^3 x - \sin^3 x\right) = 5\left(\cos x - \sin x\right)$

w) ★★★ $\dfrac{\sin x + 1}{\cos x} = \dfrac{\cos x + 1}{\sin x}$

x) ★★ $\sin x + \sin 2x + \sin 3x = \cos x + \cos 2x + \cos 3x$

y) ★★★ $\sqrt{1+\cos x} = \sqrt{2}\sin\dfrac{x}{2}$

2. ★★★★ Los op: $\sin(4\sin x) = \cos(5\cos x)$ (bron: ingangsexamen burgerlijk ingenieur 1987)

3. Los de volgende ongelijkheden op:

a) ★★ $\quad \sin 2x < -\dfrac{\sqrt{3}}{2}$

b) ★★ $\quad -\dfrac{\sqrt{3}}{2} \le \cos\dfrac{x}{2} \le \dfrac{1}{2}$

c) ★★★ $\quad -1 \le \tan\left(\dfrac{2}{3}\pi - x\right) \le \sqrt{3}$

d) ★★ $\quad 2\sin^2 2x + 3\sqrt{3}\cos 2x - 5 > 0$

e) ★★ $\quad \tan x . \tan\dfrac{x}{2} \ge 0$

f) ★★★ $\quad \sin 2x < \cos x$

Veel succes!