

ECUACIONES TRIGONOMETRICAS

Resolver las siguientes ecuaciones trigonométricas elementales:

a) $\operatorname{sen} x = \frac{\sqrt{3}}{2}$

b) $\operatorname{cos} x = -\frac{\sqrt{2}}{2}$

c) $\operatorname{ctg} x = -\sqrt{3}$

d) $\operatorname{sen} x = \frac{1}{3}$

e) $\operatorname{cos} x = -\frac{4}{5}$

f) $\operatorname{sen} x = 0$ (Sol: $x = k \cdot 180^\circ$)

g) $\operatorname{cos} x = -1$ (Sol: $x = (2k+1) \cdot 180^\circ$)

h) $\operatorname{cosec} x = -2$

i) $\operatorname{sec} x = -\frac{2\sqrt{3}}{3}$

j) $\operatorname{tg} x = \sqrt{3}$

k) $\operatorname{cosec} x = \frac{1}{2}$ (Sol: \exists soluc)

l) $\operatorname{sen}^2 x + \operatorname{cos}^2 x = 1$

m) $\operatorname{cos} 3x = \frac{\sqrt{3}}{2}$ (Sol: $x = 10^\circ + k \cdot 120^\circ$; $x = 110^\circ + k \cdot 120^\circ$)

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

Resolver las siguientes ecuaciones trigonométricas:

a) $\operatorname{sen} x + \operatorname{cos} x = \sqrt{2}$ (Sol: $x = 45^\circ + k \cdot 360^\circ$)

c) $\operatorname{sen} x \operatorname{cos} x = \frac{1}{2}$ (Sol: $x = 45^\circ + k \cdot 180^\circ$)

d) $\operatorname{sen} 2x = \operatorname{cos} x$
(Sol: $x = 30^\circ + k \cdot 360^\circ$; $x = 150^\circ + k \cdot 360^\circ$; $x = 90^\circ + k \cdot 180^\circ$)

e) $\sqrt{3} \operatorname{sen} x + \operatorname{cos} x = 1$ (Sol: $x = k \cdot 360^\circ$; $x = 120^\circ + k \cdot 360^\circ$)

f) $2\operatorname{cos}^2 x - \operatorname{sen}^2 x + 1 = 0$ (Sol: $x = 90^\circ + k \cdot 180^\circ$)

g) $\operatorname{sen}^2 x - \operatorname{sen} x = 0$ (Sol: $x = k \cdot 180^\circ$; $x = 90^\circ + k \cdot 360^\circ$)

h) $2\operatorname{cos}^2 x - \sqrt{3} \operatorname{cos} x = 0$
(Sol: $x = 90^\circ + k \cdot 180^\circ$; $x = 30^\circ + k \cdot 360^\circ$; $x = 330^\circ + k \cdot 360^\circ$)

i) $\operatorname{sen}^2 x - \operatorname{cos}^2 x = 1$ (Sol: $x = 90^\circ + k \cdot 180^\circ$)

j) $\operatorname{cos}^2 x - \operatorname{sen}^2 x = 0$ (Sol: $x = 45^\circ + k \cdot 90^\circ$)

k) $2\operatorname{cos}^2 x + \operatorname{sen} x = 1$
(Sol: $x = 90^\circ + k \cdot 360^\circ$; $x = 210^\circ + k \cdot 360^\circ$; $x = 330^\circ + k \cdot 360^\circ$)

l) $3\operatorname{tg}^2 x - \sqrt{3} \operatorname{tg} x = 0$
(Sol: $x = k \cdot 180^\circ$; $x = 30^\circ + k \cdot 360^\circ$; $x = 210^\circ + k \cdot 360^\circ$)

m) $\operatorname{sen}\left(\frac{\pi}{4} + x\right) - \sqrt{2} \operatorname{sen} x = 0$ (Sol: $x = 45^\circ + k \cdot 180^\circ$)

n) $\operatorname{sen}\left(\frac{\pi}{6} - x\right) + \operatorname{cos}\left(\frac{\pi}{3} - x\right) = \frac{1}{2}$
(Sol: $x = 60^\circ + k \cdot 360^\circ$; $x = 300^\circ + k \cdot 360^\circ$)

o) $\operatorname{sen} 2x - 2\operatorname{cos}^2 x = 0$ (Sol: $x = 90^\circ + k \cdot 180^\circ$; $x = 45^\circ + k \cdot 180^\circ$)

p) $\operatorname{cos} 2x - 3\operatorname{sen} x + 1 = 0$ (Sol: $x = 30^\circ + k \cdot 360^\circ$; $x = 150^\circ + k \cdot 360^\circ$)

b) $\operatorname{sen} x - 2\operatorname{cos} 2x = -\frac{1}{2}$
(Sol: 30° , 150° , $\cong 311^\circ 24' 35''$ y $\cong 228^\circ 35' 25''$)

q) $4\operatorname{sen}^2 x \operatorname{cos}^2 x + 2\operatorname{cos}^2 x - 2 = 0$ (Sol: $x = k \cdot 180^\circ$; $x = 45^\circ + k \cdot 90^\circ$)

r) $4\operatorname{sen}^2 x + \operatorname{sen} x \operatorname{cos} x - 3\operatorname{cos}^2 x = 0$
(Sol: $x = 36^\circ 52' 11,6'' + k \cdot 180^\circ$; $x = 135^\circ + k \cdot 180^\circ$)

s) $\operatorname{cos}^2 \frac{x}{2} + \operatorname{cos} x = \frac{1}{2}$ (Sol: $x = 90^\circ + k \cdot 180^\circ$)

t) $\operatorname{tg}^2 \frac{x}{2} + 1 = \operatorname{cos} x$ (Sol: $x = k \cdot 360^\circ$)

u) $2\operatorname{sen}^2 \frac{x}{2} + \operatorname{cos} 2x = 0$
(Sol: $x = 90^\circ + k \cdot 180^\circ$; $x = 60^\circ + k \cdot 360^\circ$; $x = 300^\circ + k \cdot 360^\circ$)

v) $\operatorname{cos} 2x + 3\operatorname{sen} x = 2$

w) $\operatorname{tg} 2x \operatorname{tg} x = 1$

x) $\operatorname{cos} x \operatorname{cos} 2x + 2\operatorname{cos}^2 x = 0$

y) $2\operatorname{sen} x = \operatorname{tg} 2x$

z) $\sqrt{3} \operatorname{sen} \frac{x}{2} + \operatorname{cos} x = 1$

α) $\operatorname{sen} 2x \operatorname{cos} x = 6\operatorname{sen}^3 x$

β) $\operatorname{tg}\left(\frac{\pi}{4} - x\right) + \operatorname{tg} x = 1$

γ) $\operatorname{sen} x - \sqrt{3} \operatorname{cos} x = 2$ (Sol: $x = 150^\circ + k \cdot 360^\circ$)

Resolver las siguientes ecuaciones, transformando las sumas y diferencias en productos:

a) $\operatorname{sen} 3x - \operatorname{sen} x = \operatorname{cos} 2x$

b) $\frac{\operatorname{sen} 5x + \operatorname{sen} 3x}{\operatorname{cos} x + \operatorname{cos} 3x} = 1$

c) $\frac{\operatorname{sen} 3x + \operatorname{sen} x}{\operatorname{cos} 3x - \operatorname{cos} x} = \sqrt{3}$

d) $\operatorname{sen} 3x - \operatorname{cos} 3x = \operatorname{sen} x - \operatorname{cos} x$