

## 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:  $30^\circ$ ,  $150^\circ$ ,  $\cong 311^\circ 24' 35''$  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:  $x = 150^\circ + k \cdot 360^\circ$ )

 Ejercicios libro: pág. 137: 1, 2, 4 y 5; pág. 143 y ss.: 18 a 21, 33

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