Ecuaciones Trigonométricas

A) Resuelve las siguientes ecuaciones trigonométricas:

1. $sen2x = \cos 60^o$
2. $tg2x = -tgx$
3. $sen^2x - \cos^2 x = 1/2$
4. $senx = sen(45^o - x)$
5. $sen(x+45^o) = \frac{\sqrt{3}}{2}$
6. $senx + \sqrt{3}\cos x = 2$
7. $tgx \cdot \sec x = \sqrt{2}$
8. $\frac{sen^2 x}{2} = \frac{tgx}{4}$
9. $4tgx = \frac{\sqrt{3}}{\cos^2 x}$
10. $tg(x-45^o) + tg(x+45^o) = 2ctgx$
11. $\cos x \cdot \cos 2x + 2\cos^2 x = 0$
12. $\cos 2x + senx = 4sen^2 x$
13. $2tgx - 3ctgx - 1 = 0$
14. $sen2x \cdot \cos x = 6sen^3 x$
15. $\cos x = \frac{2tgx}{1+tg^2 x}$
16. $3\cos x = 2\sec x - 5$
17. $\frac{sen(x+30^o)}{\cos(x+60^o)} = 1$
18. $4sen\frac{x}{2} + 2\cos x = 3$
19. $4sen(x-30^o)\cos(x-30^o) = \sqrt{3}$
20. $tg\frac{x}{2} = \frac{tgx-2}{tgx+2}$
21. $3sen^2 x - 5senx + 2 = 0$
22. $\cos 2x = 5 - 6\cos^2 x$
23. $\cos 2x + 5\cos x + 3 = 0$
24. $\frac{\cos x}{tgx} = \frac{3}{2}$
25. $sen6x + sen2x = 2sen4x$
26. $\cos 2x + \cos x = senx + sen2x$
27. $\cos 2x - \cos 6x = sen5x + sen3x$
28. $\cos 8x + \cos 6x = 2\cos 210^o \cdot \cos x$
29. $4sen(x-30^o)\cdot\cos(x-30^o) = \sqrt{3}$
30. $\cos 4x + \cos 2x = sen4x - sen2x$

Soluciones

1) $x_1 = \frac{\pi}{12} + k\pi; x_2 = \frac{5\pi}{12} + k\pi$ 2) $x_1 = k\pi; x_2 = \frac{\pi}{3} + k\pi$ $x_3 = \frac{2\pi}{3} + k\pi$ 3) $x_1 = \frac{\pi}{3} + k\pi; x_2 = \frac{2\pi}{3} + k\pi$ 4) $x = \frac{\pi}{8} + k\pi$

5) $x_1 = \frac{\pi}{12} + 2k\pi; x_2 = \frac{5\pi}{12} + 2k\pi$ 6) $x_1 = \frac{\pi}{6} + 2k\pi$

7) $x_1 = \frac{\pi}{4} + 2k\pi; x_2 = \frac{3\pi}{4} + 2k\pi$ 8) $x_1 = k\pi; x_2 = \frac{\pi}{4} + k\pi$

9) $x_1 = \frac{\pi}{3} + k\pi; x_2 = \frac{\pi}{6} + k\pi$ 10) $x = \frac{\pi}{2} + k\pi; x_2 = \frac{\pi}{6} + k\pi$ $x_3 = \frac{5\pi}{6} + k\pi$ 11) $x_1 = \frac{\pi}{2} + k\pi; x_2 =$ 68°31'45,47"+360k $x_3 =$ 291°29'45,47"+360k 12) $x_1 = \frac{\pi}{6} + 2k\pi;$ $x_2 = \frac{5\pi}{6} + 2k\pi;$ $\begin{cases} x_3 = 340°31'43,61" + 360k \\ x_4 = 199°28'14,53" + 360k \end{cases}$

13) $x_1 = \frac{3\pi}{4} + k\pi; x_2 = 56°18'35,76" + 180k$ 14) $x_1 = k\pi$ $x_2 = \frac{\pi}{6} + k\pi; x_3 = \frac{5\pi}{6} + k\pi$ 15) $x_1 = \frac{\pi}{6} + 2k\pi; x_2 = \frac{5\pi}{6} + 2k\pi$

16) $\begin{cases} x_1 = 70°31'43,61" + 360k \\ x_2 = 289°28'16,39" + 360k \end{cases}$ 17) $x = k\pi$

18) $\begin{cases} x_1 = \frac{\pi}{3} + 2k\pi \\ x_2 = \frac{5\pi}{3} + 2k\pi \end{cases}$ 19) $\begin{cases} x_1 = \frac{\pi}{3} + k\pi \\ x_2 = \frac{\pi}{2} + k\pi \end{cases}$ 20) *No sol*

21) $x_1 = \frac{\pi}{2} + 2k\pi;$ $\begin{cases} x_2 = 41°48'37,13" + 360k \\ x_3 = 138°11'22,87" + 360k \end{cases}$

22) $x_1 = \frac{\pi}{6} + k\pi; x_2 = \frac{5\pi}{6} + k\pi$ 23) $x_1 = \frac{2\pi}{3} + 2k\pi;$ $x_2 = \frac{4\pi}{3} + 2k\pi$ 24) $x = \frac{\pi}{6} + k\pi$ 25) $x = \frac{k\pi}{4}$ 26) $x_1 = (2k-1)\frac{\pi}{4}$ $x_2 = \pi + 2k\pi$ 27) $x_1 = \frac{k\pi}{4}; x_2 = \frac{\pi}{6} + 2k\pi; x_3 = \frac{5\pi}{6} + 2k\pi;$

28) $x = \frac{\pi}{2} + k\pi$ 29) $x_1 = \frac{\pi}{3} + k\pi; x_2 = \frac{\pi}{2} + k\pi$

30) $x_1 = \frac{\pi}{6} + \frac{k\pi}{3}; x_2 = (2k-1)\frac{\pi}{4}$

B) Resuelve los siguientes sistemas de ec. trigonométricas:

1. $\begin{cases} senx + \cos y = \sqrt{2} \\ \cos ecx + \sec y = 2\sqrt{2} \end{cases}$
2. $\begin{cases} senx\cos y = 3/4 \\ \cos x seny = 1/4 \end{cases}$
3. $\begin{cases} senx + seny = \frac{\sqrt{3}+1}{2} \\ senx - seny = \frac{\sqrt{3}-1}{2} \end{cases}$
4. $\begin{cases} tgx + tgy = 1 \\ ctg(x+y) = 3/4 \end{cases}$
5. $\begin{cases} senx + seny = 3/2 \\ \cos\frac{x-y}{2} = \frac{\sqrt{3}}{2} \end{cases}$
6. $\begin{cases} tg2x = \cot gy \\ tgx = ctg2y \end{cases}$
7. $\begin{cases} sen(x+y) - \cos x\cos y = 0 \\ tgy = 1 \end{cases}$
8. $\begin{cases} \cos(x+y) = 1/2 \\ \cos(x-y) = 1/2 \end{cases}$
9. $\begin{cases} senx + seny = 1 \\ 2x + 2y = 180^o \end{cases}$
10. $\begin{cases} senx = \sqrt{2}seny \\ tgx = \sqrt{3}tgy \end{cases}$
11. $\begin{cases} x + y = \frac{2\pi}{3} \\ senx - seny = 0'5 \end{cases}$
12. $\begin{cases} x + y = \pi/4 \\ \sqrt{2}\cos x\cos y = 1 \end{cases}$

Soluciones

1) $\begin{cases} x_1 = \frac{\pi}{4} + 2k\pi & x_2 = \frac{3\pi}{4} + 2k\pi \\ y_1 = \frac{\pi}{4} + 2k\pi & y_2 = \frac{7\pi}{4} + 2k\pi \end{cases}$ 2) $\begin{cases} x_1 = \frac{\pi}{3} + 2k\pi \\ y_1 = \frac{\pi}{6} + 2k\pi \end{cases}$

2b) $\begin{cases} x_2 = \frac{2\pi}{3} + 2k\pi \\ y_2 = \frac{11\pi}{6} + 2k\pi \end{cases}$ 3) $\begin{cases} x_1 = \frac{\pi}{3} + 2k\pi \\ x_2 = \frac{2\pi}{3} + 2k\pi \end{cases}$ $y = \frac{\pi}{2} + 2k\pi$

4) $\{x = y = 26°33'54,18" + 180K$ 5) $\begin{cases} x = \frac{\pi}{2} + 2k\pi & y = \frac{\pi}{6} + 2k\pi \end{cases}$

6) $\begin{cases} x = y = \frac{\pi}{6} + k\pi \end{cases}$ 7) $\begin{cases} x = 0 + k\pi & y = \frac{\pi}{4} + k\pi \end{cases}$

8) $\begin{cases} x_1 = \frac{\pi}{3} + 2k\pi & x_2 = \frac{5\pi}{3} + 2k\pi & y = 0 + 2k\pi \end{cases}$

9) $\begin{cases} x_1 = 0 + 2k\pi & x_2 = \frac{\pi}{2} + 2k\pi \\ y_1 = \frac{\pi}{2} + 2k\pi & y_2 = 0 + 2k\pi \end{cases}$

10) $\begin{cases} x_1 = 0 + 2k\pi & x_2 = \frac{\pi}{4} + k\pi & x_3 = \frac{3\pi}{4} + 2k\pi \\ y_1 = 0 + 2k\pi & y_1 = \frac{\pi}{6} + 2k\pi & y_3 = \frac{5\pi}{6} + 2k\pi \end{cases}$

11) $\begin{cases} x = \frac{\pi}{2} + k\pi \\ y = \frac{\pi}{6} + k\pi \end{cases}$ 12) $\begin{cases} y = 0 + 2k\pi \\ x = \frac{7\pi}{4} + 2k\pi \end{cases}$