Sistemi di equazioni goniometriche

risolvere i seguenti sistemi di equazioni goniometriche

1	$\begin{cases} x + y = 90° \\ \sqrt{3}\sin x - \sin y = 0 \end{cases}$	$\begin{cases} x = 30° - k180° \\ y = 60° + k180° \end{cases}$
2	$\begin{cases} x + y = 60° \\ \tan(x - y) = -\sqrt{3} \end{cases}$	$\begin{cases} x = 90° + k90° \\ y = -30 - k90° \end{cases}$
3	$\begin{cases} x - y = 45° \\ \cos(x + y) = \dfrac{\sqrt{2}}{2} \end{cases}$	$\begin{cases} x = 45° + k180° \\ y = k180° \end{cases} \vee \begin{cases} x = 180° + k180° \\ y = 135° + k180° \end{cases}$
4	$\begin{cases} x - y = \dfrac{\pi}{2} \\ 2\sin x \cos y = 1 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + k\dfrac{\pi}{2} \\ y = \dfrac{\pi}{4} + k\pi \end{cases}$
5	$\begin{cases} x + 2y = \dfrac{\pi}{3} \\ \sin\dfrac{x}{2} + \cos y = \sqrt{3} \end{cases}$	$\begin{cases} x = \dfrac{2}{3}\pi + 4k\pi \\ y = -\dfrac{\pi}{6} + 2k\pi \end{cases}$
6	$\begin{cases} x + y = 90° \\ 3\tan x \cot y = 1 \end{cases}$	$\begin{cases} x = 30 - k180° \\ y = 60° + k180° \end{cases}$
7	$\begin{cases} x = \dfrac{1}{2}y \\ \sin^2 x + \cos^2 y = \dfrac{1}{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + k\dfrac{\pi}{2} \\ y = \dfrac{\pi}{2} + k\pi \end{cases} \vee \begin{cases} x = \pm\dfrac{\pi}{6} + h\pi \\ y = \pm\dfrac{\pi}{3} + 2k\pi \end{cases}$
8	$\begin{cases} x + y = \dfrac{3}{2}\pi \\ \sin x + \sin y = 1 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + 2k\pi \\ y = \pi + 2k\pi \end{cases} \vee \begin{cases} x = \pi + 2k\pi \\ y = \dfrac{\pi}{2} + 2k\pi \end{cases}$

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9	$\begin{cases} x - y = \dfrac{\pi}{3} \\ \sin x - \dfrac{\sqrt{3}}{2}\cos y = \dfrac{1}{4} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + 2h\pi \\ y = \dfrac{\pi}{6} + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{7}{6}\pi + 2k\pi \\ y = \dfrac{5}{6}\pi + 2k\pi \end{cases}$
10	$\begin{cases} x - y = \dfrac{\pi}{3} \\ \sin x - \cos y = \dfrac{1}{2} \end{cases}$	$\begin{cases} x = 2k\pi \\ y = -\dfrac{\pi}{3} + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{5}{6}\pi + 2k\pi \\ y = \dfrac{\pi}{2} + 2k\pi \end{cases}$
11	$\begin{cases} x + y = \pi \\ \sin 2x + \cos y = 0 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + k\pi \\ y = \dfrac{\pi}{2} + h\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + 2k\pi \\ y = \dfrac{5}{6}\pi + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{5}{6}\pi + 2k\pi \\ y = \dfrac{\pi}{6} + 2k\pi \end{cases}$
12	$\begin{cases} y = \cos x \\ y = 1 - 2\sqrt{x} \end{cases}$	$x = 0$
13	$\begin{cases} y = \sin x \\ y = 1 - 2x \end{cases}$	$x = \alpha, \, con \; 0 < \alpha < \dfrac{\pi}{2}$
14	$\begin{cases} x + y = \pi \\ \cos x - \cos y = -1 \end{cases}$	$\begin{cases} x = \dfrac{4}{3}\pi + 2k\pi \\ y = -\dfrac{\pi}{3} + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{2}{3}\pi + 2k\pi \\ y = \dfrac{\pi}{3} + 2k\pi \end{cases}$
15	$\begin{cases} \tan y + 2\cot x = 0 \\ 2y - 2x = \pi \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + k\pi \\ y = \pi + 2k\pi \end{cases}$
16	$\begin{cases} x - y = \dfrac{3}{2}\pi \\ \cos x + 3\sin y = 2\sqrt{2} \end{cases}$	$\begin{cases} x = \dfrac{7}{4}\pi + 2k\pi \\ y = \dfrac{\pi}{4} + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{9}{4}\pi + 2k\pi \\ y = \dfrac{3}{4}\pi + 2k\pi \end{cases}$

17	$\begin{cases} \sqrt{3}\sin x + \cos y = \sqrt{3} \\ 4x + 4y = 8\pi \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + 2k\pi \\ y = \dfrac{3}{2}\pi + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + 2k\pi \\ y = \dfrac{11}{3}\pi + 2k\pi \end{cases}$
18	$\begin{cases} x + y = \dfrac{\pi}{2} \\ \sin\left(\dfrac{\pi}{2} + x\right) + \cos y = 1 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + 2k\pi \\ y = +2k\pi \end{cases} \vee \begin{cases} x = +2k\pi \\ y = \dfrac{\pi}{2} + 2k\pi \end{cases}$
19	$\begin{cases} x + y = \pi \\ \sin y \cos x - \cos^2 x = 0 \end{cases}$	$\begin{cases} x = \pm\dfrac{\pi}{4} + k\pi \\ y = k\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{2} + k\pi \\ y = \dfrac{\pi}{2} + k\pi \end{cases}$
20	$\begin{cases} x + y = \dfrac{3}{2}\pi \\ \sin x \cos y = -\dfrac{1}{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + k\dfrac{\pi}{2} \\ y = \dfrac{5}{4}\pi + k\dfrac{\pi}{2} \end{cases}$
21	$\begin{cases} x + y = \dfrac{\pi}{2} \\ \cos x \sin y = \dfrac{1}{4} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{3} + k\pi \vee x = -\dfrac{\pi}{3} + k\pi \\ y = \dfrac{\pi}{6} + k\pi \vee y = \dfrac{5}{6}\pi + k\pi \end{cases}$
22	$\begin{cases} 2x + y = \dfrac{\pi}{4} \\ \cos x + \sin y = -\dfrac{\sqrt{2}}{2} \end{cases}$	$\begin{cases} x = \frac{\pi}{2} + k\pi \\ y = -\frac{3}{4}\pi + 2k\pi \end{cases} \vee \begin{cases} x = \frac{5}{12}\pi + 2k\pi \\ y = -\frac{7}{12}\pi + 4k\pi \end{cases} \vee \begin{cases} x = \frac{13}{12}\pi + 2k\pi \\ y = -\frac{23}{12}\pi + 4k\pi \end{cases}$
23	$\begin{cases} x - y = \dfrac{\pi}{6} \\ \sin x \cos y = \dfrac{1}{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{2} + k\pi \\ y = \dfrac{\pi}{3} + h\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + k\pi \\ y = k\pi \end{cases}$
24	$\begin{cases} x - 2y = -\dfrac{3}{4}\pi \\ \cos x - \cos y = 0 \end{cases}$	$\begin{cases} x = \dfrac{3}{4}\pi + 4k\pi \\ y = \dfrac{3}{4}\pi + 2k\pi \end{cases} \vee \begin{cases} x = -\dfrac{\pi}{4} + k\dfrac{4}{3}\pi \\ y = \dfrac{\pi}{4} + h\dfrac{2}{3}\pi \end{cases}$

25	$\begin{cases} 2x + y = \pi \\ \tan 2x - \tan y = 2 \end{cases}$		$\begin{cases} x = \dfrac{\pi}{8} + k\dfrac{\pi}{2} \\ y = \dfrac{3}{4}\pi - k\pi \end{cases}$
26	$\begin{cases} x - y = \dfrac{\pi}{2} \\ 3\sin x - \cos y = \sqrt{2} \end{cases}$		$\begin{cases} x = \dfrac{3}{4}\pi + 2k\pi \\ y = \dfrac{\pi}{4} + 2k\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{4} + 2k\pi \\ y = -\dfrac{\pi}{4} + 2k\pi \end{cases}$
27	$\begin{cases} \sin x + \cos y = 1 \\ \sin^2 x + 3\cos^2 y - 1 = 0 \end{cases}$		$\begin{cases} x = \dfrac{\pi}{2} + 2k\pi \\ y = \dfrac{\pi}{2} + h\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + 2k\pi \vee \dfrac{5}{6}\pi + 2k\pi \\ y = y = \pm\dfrac{\pi}{3} + 2h\pi \end{cases}$
28	$\begin{cases} \sin x - \cos y = 1 \\ \sin^2 x - \cos^2 y = 0 \end{cases}$		$\begin{cases} x = \dfrac{\pi}{6} + 2k\pi \\ y = \dfrac{2}{3}\pi + 2h\pi \end{cases} \vee \begin{cases} x = \dfrac{5}{6}\pi + 2k\pi \\ y = \dfrac{4}{3}\pi + 2h\pi \end{cases}$
29	$\begin{cases} \sqrt{3}\sin x - \cos y = 0 \\ \sin^2 x + \cos^2 y = 1 \end{cases}$		$\begin{cases} x = \dfrac{\pi}{6} + 2k\pi; \quad x = \dfrac{5}{6}\pi + 2k\pi \\ y = \pm\dfrac{\pi}{6} + 2h\pi \end{cases}$ $\begin{cases} x = -\dfrac{\pi}{6} + 2k\pi; \ x = -\dfrac{5}{6}\pi + 2k\pi \\ y = \pm\dfrac{5}{6}\pi + 2h\pi \end{cases}$
30	$\begin{cases} \sin x + \cos y = 1 \\ \sin^2 x + 3\cos^2 y = 1 \end{cases}$		$\begin{cases} x = \dfrac{\pi}{2} + 2k\pi \\ y = \dfrac{\pi}{2} + h\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + 2k\pi; \quad x = \dfrac{5}{6}\pi + 2k\pi \\ y = \pm\dfrac{\pi}{3} + 2h\pi \end{cases}$
31	$\begin{cases} \sin(x - y) = 0 \\ \tan(x + y) = \sqrt{3} \end{cases}$		$\begin{cases} x = \dfrac{\pi}{6} + k\dfrac{\pi}{2} + h\dfrac{\pi}{2} \\ y = \dfrac{\pi}{6} + k\dfrac{\pi}{2} - h\dfrac{\pi}{2} \end{cases}$

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32	$\begin{cases} \dfrac{sinx}{siny} = \sqrt{3} \\ 2x + 2y = \pi \end{cases}$	$\begin{cases} x = \dfrac{\pi}{6} + k\pi \\ y = \dfrac{\pi}{3} + k\pi \end{cases}$
33	$\begin{cases} 3sinx + cosy = 2 \\ sinx - 7cosy = -3 \end{cases}$	$\begin{cases} x = (-1)^k \dfrac{\pi}{6} + k\pi \\ y = \pm \dfrac{\pi}{3} + 2h\pi \end{cases}$
34	$\begin{cases} cosx + cosy = -1 \\ cos2x - cos2y = 2 \end{cases}$	$\begin{cases} x = \pi + 2k\pi \\ y = \dfrac{\pi}{2} + h\pi \end{cases}$
35	$\begin{cases} sinx\ siny = \dfrac{1}{4} \\ cosx\ cosy = \dfrac{3}{4} \end{cases}$	$\begin{cases} x = \pm \dfrac{\pi}{6} + k\pi \\ y = \pm \dfrac{\pi}{6} + h\pi \end{cases}$
36	$\begin{cases} cos^2x + cos^2y = \dfrac{5}{4} \\ sin^2x - sin^2y = \dfrac{1}{4} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + k\dfrac{\pi}{2} \\ y = \pm \dfrac{\pi}{6} + h\pi \end{cases}$
37	$\begin{cases} sinx = \sqrt{2}siny \\ 3cosx = \sqrt{6}cosy \end{cases}$	$\begin{cases} x = \pm \dfrac{\pi}{4} + k\pi \\ y = \pm \dfrac{\pi}{6} + h\pi \end{cases}$
38	$\begin{cases} tanx + tany = 2\sqrt{2} \\ tan^2x - tan^2y = -4\sqrt{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{8} + k\pi \\ y = \dfrac{3}{8}\pi + h\pi \end{cases}$
39	$\begin{cases} \sqrt{3}\ tan\,x - tan\,y - 3 = 0 \\ \sqrt{3}\ tan\,x + tan\,y - 3 = 0 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{3} + k\pi \\ y = k_1\pi \end{cases}$

40	$\begin{cases} \cos x + \cos y = \dfrac{1-\sqrt{3}}{2} \\ \sqrt{3}\cos x + \cos y = 0 \end{cases}$	$\begin{cases} x = \pm\dfrac{\pi}{3} + 2k\pi \\ y = \pm\dfrac{5}{6}\pi + 2k_1\pi \end{cases}$
41	$\begin{cases} \cos x + \sin y = \dfrac{2+\sqrt{2}}{2} \\ \cos x + \cos y = \dfrac{\sqrt{2}}{2} \end{cases}$	$\begin{cases} x = \pm\dfrac{\pi}{4} + 2k\pi \\ y = \dfrac{\pi}{2} + 2k\pi \end{cases}$
42	$\begin{cases} \cos x + \sin y = 1 \\ \cos x \sin y = \dfrac{1}{4} \end{cases}$	$\begin{cases} x = \pm\dfrac{\pi}{3} + 2k\pi \\ y = \dfrac{\pi}{6} + 2k_1\pi \ \lor \ y = \dfrac{5}{6}\pi + 2k_1\pi \end{cases}$
43	$\begin{cases} 2\tan x + 6\tan y = 0 \\ \tan x + \tan y = \dfrac{2}{3}\sqrt{3} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{3} + k\pi \\ y = \dfrac{5}{6}\pi + k_1\pi \end{cases}$
44	$\begin{cases} \sin^2 x + \cos^2 y = 1 \\ \cos^2 x - \sin^2 y = 0 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + 2k\pi \ \lor \ x = \dfrac{3}{4}\pi + 2k\pi \\ y = \dfrac{\pi}{4} + 2k_1\pi \ \lor \ x = \dfrac{3}{4}\pi + 2k_1\pi \end{cases}$
45	$\begin{cases} 2\sin x - 2\sin y = 1 \\ \sin y - \sin x = 2 \end{cases}$	*impossibile*
46	$\begin{cases} 2\sin x + 2\sin y = \sqrt{2} + 1 \\ \sin x = \sqrt{2}\sin y \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + 2k\pi \ \lor \ x = \dfrac{3}{4}\pi + 2k\pi \\ y = \dfrac{\pi}{6} + 2k_1\pi \ \lor \ y = \dfrac{5}{6}\pi + 2k_1\pi \end{cases}$
47	$\begin{cases} 2\cos x + 4\sqrt{2}\sin y = 3\sqrt{2} \\ 2\cos x - 4\sqrt{2}\sin y = -\sqrt{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + 2k\pi \ \lor \ x = -\dfrac{\pi}{4} + 2k\pi \\ y = \dfrac{\pi}{6} + 2k_1\pi \ \lor \ y = \dfrac{5}{6}\pi + 2k_1\pi \end{cases}$
48	$\begin{cases} \sin x + 3\sin y = \sqrt{3} \\ \sin x - 3\sin y = -2\sqrt{3} \end{cases}$	$\begin{cases} x = \dfrac{4}{3}\pi + 2k\pi \ \lor \ x = \dfrac{5}{3}\pi + 2k\pi \\ y = \dfrac{\pi}{3} + 2k_1\pi \ \lor \ y = \dfrac{2}{3}\pi + 2k_1\pi \end{cases}$

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49	$\begin{cases} \sin x + 2\cos y = 1 \\ 2\sin x + 4\cos y = 1 \end{cases}$	*impossibile*
50	$\begin{cases} \sin x = \dfrac{\sqrt{3}}{3}\cos y \\ \sqrt{3}\cos y + \sin x = -2 \end{cases}$	$\begin{cases} x = \dfrac{7}{6}\pi + 2k\pi \ \vee \ x = \dfrac{11}{6}\pi + 2k\pi \\ y = \dfrac{5}{6} + 2k_1\pi \ \ \vee \ y = -\dfrac{5}{6}\pi + 2k_1\pi \end{cases}$
51	$\begin{cases} 3\cot x \tan y = 1 \\ \cot x + \tan y = \dfrac{2\sqrt{3}}{3} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{3} + k\pi \\ y = \dfrac{\pi}{6} + k_1\pi \end{cases}$
52	$\begin{cases} \cos^2 x - 2\cos^2 y = -1 \\ \cos x + 2\cos y = 1 \end{cases}$	$\begin{cases} x = \pi + 2k\pi \\ y = 2k\pi \end{cases}$
53	$\begin{cases} 2\sin x + 5\sin y = 6 \\ 4\sin^2 x + 3\sin^2 y = 4 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{6} + 2k\pi \vee x = \dfrac{5}{6}\pi + 2k\pi \\ y = \dfrac{\pi}{2} + 2k_1\pi \end{cases}$
54	$\begin{cases} \dfrac{1}{3}\cot x + \tan y = 0 \\ \dfrac{1}{2}\cot^2 x + \dfrac{3}{2}\tan^2 y = 2 \end{cases}$	$\begin{cases} x = \dfrac{5}{6}\pi + k\pi \\ y = \dfrac{\pi}{6} + k_1\pi \end{cases} \vee \begin{cases} x = \dfrac{\pi}{6} + k\pi \\ y = \dfrac{5}{6}\pi + k_1\pi \end{cases}$
55	$\begin{cases} 2\cos x + 2\cos y = \sqrt{2} + \sqrt{3} \\ \cos^2 x + 2\cos^2 y = 2 \end{cases}$	$\begin{cases} x = \pm\dfrac{\pi}{4} + 2k\pi \\ y = \pm\dfrac{\pi}{6} + 2k_1\pi \end{cases}$
56	$\begin{cases} \sin(x + y) = 1 \\ \cos(x - y) = \dfrac{\sqrt{2}}{2} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{8} + (k_1 + k_2)\pi \\ y = -\dfrac{\pi}{8} + (k_1 - k_2)\pi \end{cases} \vee \begin{cases} x = -\dfrac{\pi}{8} + (k_1 + k_2)\pi \\ y = \dfrac{\pi}{8} + (k_1 - k_2)\pi \end{cases}$

57	$\begin{cases} sin(x-y) = 0 \\ tan(x+y) = -\sqrt{3} \end{cases}$	$\begin{cases} x = \dfrac{2}{3}\pi + (k_1 + k_2)\dfrac{\pi}{2} \\ y = \dfrac{2}{3}\pi + (k_2 - k_1)\dfrac{\pi}{2} \end{cases}$
58	$\begin{cases} y = arccos\,x \\ y = x|x| \end{cases}$	$x = \alpha, con\ 0 < \alpha < 1$
59	$\begin{cases} y = arctan\,x \\ y = 1 + e^x \end{cases}$	$impossibile$
60	$\begin{cases} ln\,sinx - ln\,cosy = 0 \\ sinx\,cosy = \dfrac{3}{4} \end{cases}$	$\begin{cases} x = \dfrac{\pi}{3} + 2k\pi; \quad x = \dfrac{2}{3}\pi + 2k\pi \\ y = \pm\dfrac{\pi}{6} + 2h\pi \end{cases}$
61	$\begin{cases} 2^{sinx} - 2^{-cosy} = 0 \\ sin^2x + cos^2y = 1 \end{cases}$	$\begin{cases} x = \dfrac{\pi}{4} + 2k\pi; \quad x = \dfrac{3}{4}\pi + 2k\pi \\ y = \pm\dfrac{3}{4}\pi + 2h\pi \end{cases}$ $\begin{cases} x = -\dfrac{\pi}{4} + 2k\pi; \quad x = -\dfrac{3}{4}\pi + 2k\pi \\ y = \pm\dfrac{\pi}{4} + 2h\pi \end{cases}$