31 $\sin\left(x+\frac{\pi}{4}\right)\cdot\cos\left(x+\frac{\pi}{4}\right)+\frac{\sqrt{3}}{2}\sin 2x = 2\cos^2 x$

$\left[\frac{\pi}{3}+k\pi\right]$

$$\left[\sin x\cos\frac{\pi}{4}+\cos x\sin\frac{\pi}{4}\right]\cdot\left[\cos x\cdot\cos\frac{\pi}{4}-\sin x\cdot\sin\frac{\pi}{4}\right]+\sqrt{3}\sin x\cos x=$$

$$=2\cos^2 x$$

$$\left[\frac{\sqrt{2}}{2}\sin x+\frac{\sqrt{2}}{2}\cos x\right]\left[\frac{\sqrt{2}}{2}\cos x-\frac{\sqrt{2}}{2}\sin x\right]+\sqrt{3}\sin x\cos x=2\cos^2 x$$

$$\frac{1}{2}\cos^2 x-\frac{1}{2}\sin^2 x+\sqrt{3}\sin x\cos x-2\cos^2 x=0$$

$$-\frac{3}{2}\cos^2 x-\frac{1}{2}\sin^2 x+\sqrt{3}\sin x\cos x=0$$

$$\frac{\sin^2 x}{\cos^2 x}-\frac{2\sqrt{3}\sin x\cos x}{\cos^2 x}+\frac{3\cos^2 x}{\cos^2 x}=0$$

$\tan^2 x-2\sqrt{3}\tan x+3=0$ $\quad\Delta=0 \Rightarrow$ è un quadrato

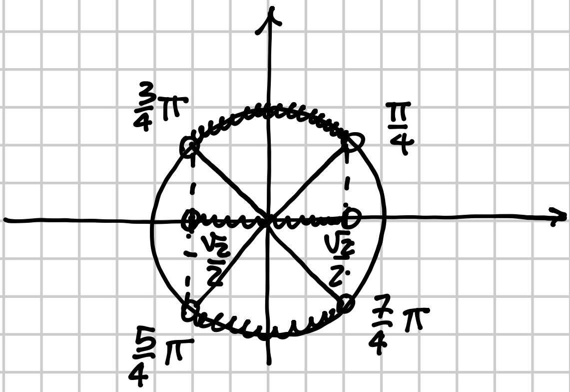
$$(\tan x-\sqrt{3})^2=0 \Rightarrow \tan x=\sqrt{3}$$

$$\Downarrow$$

$$\boxed{x=\frac{\pi}{3}+k\pi}$$

62 $\left|\cos\left(2x+\frac{\pi}{4}\right)\right| < \frac{\sqrt{2}}{2}$ $\left[k\frac{\pi}{2} < x < \frac{\pi}{4} + k\frac{\pi}{2}\right]$

$$-\frac{\sqrt{2}}{2} < \cos\left(2x+\frac{\pi}{4}\right) < \frac{\sqrt{2}}{2}$$



$$\frac{\pi}{4} + k\pi < 2x + \frac{\pi}{4} < \frac{3}{4}\pi + k\pi$$

$$k\pi < 2x < \frac{\pi}{2} + k\pi$$

$$\boxed{k\frac{\pi}{2} < x < \frac{\pi}{4} + k\frac{\pi}{2}}$$

37 $\sin x \cdot \tan\frac{x}{2} = 2\cos^2\frac{x}{2} - 2\cos^2 x$ $\left[\frac{\pi}{2} + k\pi; 2k\pi\right]$

C.E.

$\frac{x}{2} \neq \frac{\pi}{2} + k\pi$

$x \neq \pi + 2k\pi$

$$\cancel{\sin x} \cdot \frac{1-\cos x}{\cancel{\sin x}} = \cancel{2} \cdot \frac{1+\cos x}{\cancel{2}} - 2\cos^2 x$$

$$\cancel{1} - \cos x = \cancel{1} + \cos x - 2\cos^2 x$$

$$2\cos^2 x - 2\cos x = 0$$

$$2\cos x(\cos x - 1) = 0$$

$\cos x = 0 \Rightarrow$ $x = \frac{\pi}{2} + k\pi$

$\vee$

$\cos x = 1 \Rightarrow$ $x = 2k\pi$