105. Cont.

d) $\sqrt{2}\sin x + \operatorname{tg} x = 0 \;,\; x \in [-\pi, \pi]$

$\therefore$

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

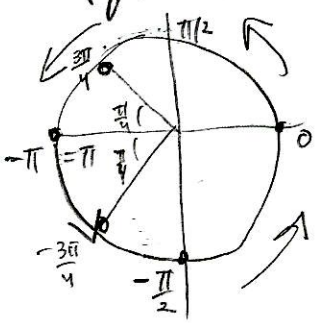
$$\frac{\sqrt{2}\sin x \cos x + \sin x}{\cos x} = 0$$

$$\frac{\sin x\,(\sqrt{2}\cos x + 1)}{\cos x} = 0$$

$$\operatorname{tg} x\,(\sqrt{2}\cos x + 1) = 0$$

$$\Rightarrow \begin{cases} \operatorname{tg} x = 0 \\ \text{ou} \\ \cos x = -\frac{1}{\sqrt{2}} \end{cases}$$

$\operatorname{tg} x = 0 \Rightarrow x = -\pi \;,\; 0 \;,\; \pi$




$\cos x = -\frac{1}{\sqrt{2}} \Rightarrow x = -\frac{3\pi}{4} \;,\; \frac{3\pi}{4}$

$\therefore$

$$x = -\pi \;,\; -\frac{3\pi}{4} \;,\; 0 \;,\; \frac{3\pi}{4} \;,\; \pi$$

e) $\cos^2 x - 3\sin^2 x = 1 \;;\; [-2\pi, 2\pi]$

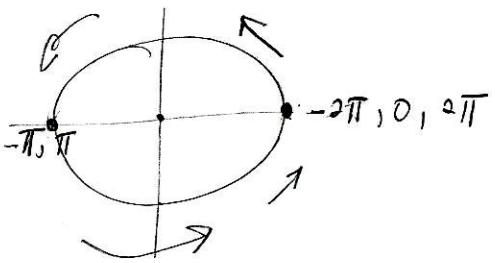
$\cos^2 x - 3(1 - \cos^2 x) = 1$

$\cos^2 x - 3 + 3\cos^2 x = 1$

$4\cos^2 x = 4$

$\cos^2 x = 1$

$\cos x = \pm 1$




$\Rightarrow$ $x = -2\pi, -\pi, 0, \pi, 2\pi$

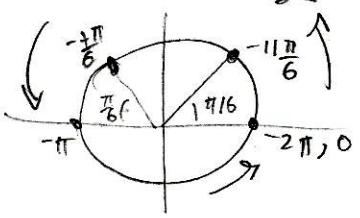
f) $2\operatorname{tg} x = \operatorname{sec} x \;,\; [-2\pi, 0]$

$\therefore$

$$2\frac{\sin x}{\cos x} = \frac{1}{\cos x}$$

$\cos x \neq 0$

$\sin x = \frac{1}{2} \Rightarrow x = -\frac{11\pi}{6} \;,\; -\frac{7\pi}{6}$




$-2\pi + \frac{\pi}{6} = -\frac{11\pi}{6}$

$-\pi - \frac{\pi}{6} = -\frac{7\pi}{6}$