a) $\sin 2t = \tan t$

$2\sin t \cos t = \frac{\sin t}{\cos t}$

$2t \neq 0 + k \cdot 2\pi$

$2\cos^2 t = 1$

$\cos t = \pm \frac{1}{\sqrt{2}}$

$t = \pm \frac{\pi}{4} + k \cdot 2\pi$

$t = 0 + k \cdot \pi$

b) $\cos 2x + 2\sin x \cos x = 0$

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

$1 - \tan^2 x + 2\tan x = 0$

$\tan^2 x - 2\tan x - 1 = 0$

$t^2 - 2t - 1 = 0$

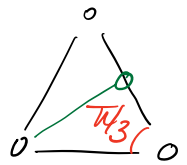
$t = \frac{2 \pm \sqrt{4+4}}{2}$

$= 1 \pm \sqrt{2}$

$x = \operatorname{arctan}(1 \pm \sqrt{2}) + k \cdot \pi$

$x = 3\pi/8 + k \cdot \pi$

c) $\boxed{\sin x \cdot \cos\left(2x+\frac{\pi}{3}\right) = \sin^2 x}$



$$\sin x \cdot \left(\cos 2x \cos\frac{\pi}{3} - \sin 2x \sin\frac{\pi}{3}\right) = \sin^2 x$$

$$\sin x \cdot \left(\cos 2x \cdot \frac{1}{2} - \sin 2x \frac{\sqrt{3}}{2}\right) = \sin^2 x$$

$$\sin x \neq 0 \Leftrightarrow x \neq \pm\frac{\pi}{2} + k\cdot 2\pi$$

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

Trop compliqué.

$$\boxed{\cos\left(2x+\frac{\pi}{3}\right) = \sin x}$$

$$\sin\left(\frac{\pi}{2} - \left(2x+\frac{\pi}{3}\right)\right) = \sin x$$

$$\sin\left(\frac{\pi}{6} - 2x\right) = \sin x$$

$$x = \frac{\pi}{18} + k\cdot\frac{2\pi}{3}$$

$$x = -\frac{5\pi}{6} + k\cdot 2\pi$$

$$\frac{\pi}{6} - 2x = x + k\cdot 2\pi \quad / \quad \frac{\pi}{6} - 2x = \pi - x + k\cdot 2\pi$$

d) $1 + \sin x = \cos 2x = \cos^2 x - \sin^2 x$

$1 + \sin x = 1 - \sin^2 x - \sin^2 x$

$2\sin^2 x + \sin x = 0$

$\sin x (2\sin x + 1) = 0$

$x = \pm \frac{\pi}{2} + k \cdot 2\pi$

$x = \arcsin\left(-\frac{1}{2}\right) + k \cdot 2\pi$

$x = \pi - \arcsin\left(-\frac{1}{2}\right) + k \cdot 2\pi$