47. $\tan 3x + 1 = \sec 3x$

①

$$\frac{\sin 3x}{\cos 3x} + 1 = \frac{1}{\cos 3x}$$

$$\sin 3x + \cos 3x = 1$$

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

$$\sin 6x = 0$$

$$6x = \begin{cases} 0 + 360^\circ k \\ 180^\circ + 360^\circ k \end{cases} \quad 0 + 180^\circ k$$

$$x = 30^\circ k$$

$0, 30^\circ, \dots$

$0, \frac{\pi}{6}, \frac{2\pi}{6}, \frac{3\pi}{6}, \dots \frac{11\pi}{6}$

47. $\tan 3x + 1 = \sec 3x$

$\tan^2 3x + 2\tan 3x + 1 = \sec^2 3x$

$\tan 3x = 0$

$3x = 0 + 180k$

$x = 60°k$

0 60 120 180 240

300

$\tan 3x + 1 = \sec 3x$

45. $\tan x - 3 \cot x = 0$

$\tan^2 x = 3$

$\tan x = \pm\sqrt{3}$

$\tan x = \sqrt{3}$, $\tan x = -\sqrt{3}$

$x = 60^\circ, 240^\circ,$ $120^\circ, 300^\circ$

69. $\sin x + \sin 3x = 0$

$\sin A + \sin B = 2 \sin \frac{A+B}{2} \cdot \cos \frac{A-B}{2}$

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