

а) Решите уравнение

$$4\sin^2 x = \operatorname{tg} x.$$

б) Найдите все его корни, принадлежащие отрезку $[-\pi; 0]$

$$4\sin^2 x = \operatorname{tg} x$$

$$4\sin^2 x - \sin x / \cos x = 0$$

$$(4\sin^2 x \cos x - \sin x) / \cos x = 0$$

$$\sin x (4\sin x \cos x - 1) / \cos x = 0$$

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

$$\operatorname{tg} x (2\sin 2x - 1) = 0$$

$$\operatorname{tg} x = 0$$

$$x = Pk$$

$$2\sin 2x = 1$$

$$\sin 2x = 1/2$$

$$2x = P/6 + 2Pk$$

$$2x = 5P/6 + 2Pk$$

$$x = P/12 + Pk$$

$$x = 5P/12 + Pk$$

$$-P \leq Pk \leq 0$$

$$-1 \leq k \leq 0$$

$$x = -P \quad x = 0$$

$$-P \leq P/12 + Pk \leq 0$$

$$-1 - 1/12 \leq k \leq -1/12$$

$$-13/12 \leq k \leq -1/12 \quad k = -1$$

$$x = P/6 - 2P = P/6 - 2P = -11P/6$$

$$-P \leq 5P/12 + Pk \leq 0$$

$$-1 \leq 5/12 + k \leq 0$$

$$-1 - 5/12 \leq k \leq -5/12$$

$$-17/12 \leq k \leq -5/12 \quad k = -1$$

$$x = 5P/12 - P = -7P/12$$

Ответ: $0; -P; -11P/6; -7P/12$