

а) Решите уравнение

$$2\sin(x + 2015\pi) \cdot \sin\left(x - \frac{2015\pi}{2}\right) = \sin x.$$

б) Найдите все его корни, принадлежащие отрезку  $\left[-2015\pi; -\frac{4015\pi}{2}\right]$

Ответ:

-2015P;

-2014P;

-2013P;

-2012P;

-2011P;

-2010P;

-2009P;

-2008P;

-6040P/3;

-6034P/3;

-6028P/3;

-6044P/3;

-6038P/3;

-6032P/3;

-6026P/3;

$$2\sin(x+2015P) \cdot \sin(x-2015P/2) = \sin x$$

$$\cos(x+2015P-x+2015P/2) - \cos(x+2015P+x-2015P/2) = \sin x$$

$$\cos(6045P/2) - \cos(2x+2015P/2) = \sin x$$

$$\cos(6045P/2) - [\cos 2x \cdot \cos 2015P/2 - \sin 2015P/2 \cdot \sin 2x] = \sin x$$

$$\cos(6045P/2) - \cos 2x \cdot \cos 2015P/2 + \sin 2015P/2 \cdot \sin 2x = \sin x$$

$$\cos(P/2) - \cos 2x \cdot \cos 3P/2 + \sin 3P/2 \cdot \sin 2x = \sin x$$

$$-\sin 2x = \sin x$$

$$-2015P \leq Pk \leq -4015P/2$$

$$-2\cos x \sin x = \sin x$$

$$-2015 \leq k \leq -4015/2$$

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

$$-2015; -2014; -2013; -2012; -2011;$$

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

$$-2010; -2009; -2008$$

$$\sin x = 0 \quad \cos x = -\frac{1}{2}$$

$$-2015P - 2P/3 \leq 2Pk \leq -4015P/2 - 2P/3$$

$$-2015P + 2P/3 \leq 2Pk \leq -4015P/2 + 2P/3$$

$$x = Pk \quad x = -2P/3 + 2Pk$$

$$-6047/3 \leq 2k \leq -12049/6$$

$$-2015 + 2/3 \leq 2k \leq -4015/2 + 2/3$$

$$-6047/6 \leq k \leq -12049/6$$

$$-6043/6 \leq k \leq -12041/12$$

$$-1007 \leq k \leq -1005$$

$$-1007 \leq k \leq -1004$$

$$-1007; -1006; -1005$$

$$-1007; -1006; -1005; -1004$$