

$$\cos x \cdot \cos 2x \cdot \cos 4x \cdot \cos 8x = \frac{1}{8} \cdot \cos 15x$$

если у нас полномочия умножить обе части $\sin x$

$$8 \sin x \cdot \cos x \cdot \cos 2x \cdot \cos 4x \cdot \cos 8x = \cos 15x \cdot \sin x$$

$$4 \sin 2x \cdot \cos 2x \cdot \cos 4x \cdot \cos 8x = \cos 15x \cdot \sin x$$

$$2 \cdot \sin 4x \cdot \cos 4x \cdot \cos 8x = \cos 15x \cdot \sin x$$

$$\sin 8x \cdot \cos 8x = \cos 15x \cdot \sin x$$

$$\sin 16x = 2 \cdot \cos 15x \cdot \sin x$$

$$\sin 16x = \sin 16x + \sin(-14x)$$

$$0 = \sin(-14x)$$

$$-\sin 14x = 0$$

$$\sin 14x = 0$$

$$x = \pi k / 14$$

пусть $\sin x = 0$ тогда $\cos x = \pm 1$

$$\cos 2x = 2 \cdot \cos^2 x - 1 = 1$$

$$\cos 4x = 2 \cdot \cos^2 2x - 1 = 1$$

$$\cos 8x = 1$$

$$\cos 15x = \cos(16x - x) = \cos 16x \cdot \cos x + \sin 16x \cdot \sin x = 1 \cdot (+1) + 0 \cdot \sin 16x = +$$

$$-1$$

podstavim

$$+1 = +1 - \frac{1}{8} - \text{neverno}$$

Ответ: $x = \pi k / 14$

$$\sin y + \cos 3y = 1 - 2 \sin^2 y + \sin 2y$$

$$\sin y + \cos 3y = \cos 2y + \sin 2y$$

$$\sin y - \sin 2y = \cos 2y - \cos 3y$$

$$\cos \frac{3y}{2} \cdot \sin(-\frac{y}{2}) = -\sin \frac{5y}{2} \cdot \sin(-\frac{y}{2})$$

$$\sin(-\frac{y}{2}) \cdot [\cos \frac{3y}{2} + \sin \frac{5y}{2}] = 0$$

$$\sin(-\frac{y}{2}) = \pi k$$

$$y = -2\pi k$$

$$\cos \frac{3y}{2} + \sin \frac{5y}{2} = 0$$

$$\cos(2y - \frac{y}{2}) + \sin(2y + \frac{y}{2}) = 0$$

$$\cos 2y \cdot \cos \frac{y}{2} + \sin \frac{y}{2} \cdot \sin 2y + \sin 2y \cdot \cos \frac{y}{2} + \sin \frac{y}{2} \cdot \cos 2y = 0$$

$$\cos 2y \cdot \cos \frac{y}{2} + \sin \frac{y}{2} \cdot \sin 2y + \sin 2y \cdot \cos \frac{y}{2} + \sin \frac{y}{2} \cdot \cos 2y = 0$$

$$\cos \frac{y}{2} (\cos 2y + \sin 2y) + \sin \frac{y}{2} (\sin 2y + \cos 2y) = 0$$

$$(\sin 2y + \cos 2y) \{ \cos \frac{y}{2} + \sin \frac{y}{2} \} = 0$$

$$\sin 2y + \cos 2y = 0$$

$$\sqrt{2}(\sin 2y \cdot \frac{1}{\sqrt{2}} + \cos 2y \cdot \frac{1}{\sqrt{2}}) = \sqrt{2}(\sin 2y \cdot \cos \frac{\pi}{4} + \cos 2y \cdot \sin \frac{\pi}{4}) =$$

$$= \sqrt{2} \sin(2y + \frac{\pi}{4}) = 0$$

$$2y + \frac{\pi}{4} = \pi k$$

$$y = \frac{\pi k}{2} - \frac{\pi}{8}$$

$$\cos \frac{y}{2} + \sin \frac{y}{2} = 0$$

$$\sin \alpha = 0 \text{ тогда } \cos \alpha = 0 - \text{невозможно}$$

делим

$$\operatorname{tg} \frac{y}{2} = -1$$

$$\frac{y}{2} = -\frac{\pi}{4} + \pi k$$

$$y = -\frac{\pi}{2} + 2\pi k$$