

$$\sin 4x = (1 + \sqrt{2})(\sin 2x + \cos 2x - 1)$$

$$2\sin 2x \cos 2x = (1 + \sqrt{2})(\sin 2x + \cos 2x - 1)$$

$$2\sin 2x \cos 2x + 1 = (1 + \sqrt{2})(\sin 2x + \cos 2x - 1) + 1$$

$$2\sin 2x \cos 2x + \sin^2 2x + \cos^2 2x = (1 + \sqrt{2})(\sin 2x + \cos 2x - 1) + 1$$

$$(\sin 2x + \cos 2x)^2 = (1 + \sqrt{2})(\sin 2x + \cos 2x - 1) + 1$$

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

$$y^2 = (1 + \sqrt{2})(y - 1) + 1$$

$$y^2 = y - 1 + \sqrt{2}y - \sqrt{2} + 1$$

$$y^2 - y - y\sqrt{2} + \sqrt{2} = 0$$

$$y^2 + y(-1 - \sqrt{2}) + \sqrt{2} = 0$$

$$(y^2 - y\sqrt{2}) + (\sqrt{2} - y) = 0$$

$$y(y - \sqrt{2}) - (y - \sqrt{2}) = 0$$

$$(y - 1)(y - \sqrt{2}) = 0$$

$$y = 1 \quad y = \sqrt{2}$$

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

$$\sqrt{2} \sin(2x + \pi/4) = 1$$

$$\sin(2x + \pi/4) = \sqrt{2}/2$$

$$2x + \pi/4 = \pi/4 + 2\pi k$$

$$2x = 2\pi k$$

$$x = \pi k$$

$$2x + \pi/4 = \pi - \pi/4 + 2\pi k$$

$$2x = \pi/2 + 2\pi k$$

$$x = \pi/4 + \pi k$$

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

$$\cos t = \sqrt{2}/2$$

$$\sin t = \sqrt{2}/2$$

$$t = \pi/4$$

$$\sin 2x + \cos 2x = \sqrt{2}$$

$$\sqrt{2} \sin(2x + \pi/4) = \sqrt{2}$$

$$\sin(2x + \pi/4) = 1$$

$$2x + \pi/4 = \pi/2 + 2\pi k$$

$$2x = \pi/4 + 2\pi k$$

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

$$\text{ответ: } \pi k; \pi/4 + \pi k; \pi/8 + \pi k$$

