

$$1) \quad -\sqrt{2}\sin x - \sin\left(\pi - \left(\frac{\pi}{4} - x\right)\right) = 0, \quad -\sqrt{2}\sin x - \sin\left(\frac{\pi}{4} - x\right) = 0,$$

$$-\sqrt{2}\sin x - \sin\frac{\pi}{4}\cos x + \cos\frac{\pi}{4}\sin x = 0, \quad \sqrt{2}\sin x + \frac{\sqrt{2}}{2}\cos x - \frac{\sqrt{2}}{2}\sin x = 0$$

$$\sqrt{2}\sin x + \sqrt{2}\cos x = 0, \quad \operatorname{tg} x + 1 = 0, \quad \operatorname{tg} x = -1, \quad x = -\frac{\pi}{4} + \pi n, \quad n \in \mathbb{Z}$$

$$2) \quad 1 + \sin 2x = 1 + \sin 6x, \quad \sin 6x - \sin 2x = 0, \quad 2\sin 2x \cos 4x = 0,$$

$$a) \quad \sin 2x = 0, \quad 2x = \pi n, \quad x = \frac{\pi n}{2}, \quad n \in \mathbb{Z}$$

$$б) \quad \cos 4x = 0, \quad 4x = \frac{\pi}{2} + \pi n, \quad x = \frac{\pi}{8} + \frac{\pi n}{4}, \quad n \in \mathbb{Z}$$

$$3) \quad \sin^4 x + \cos^4 x - 2\sin^2 x \cos^2 x = 0, \quad (\sin^2 x - \cos^2 x)^2 = 0,$$

$$\sin^2 x - \cos^2 x = 0, \quad \operatorname{tg}^2 x - 1 = 0, \quad \operatorname{tg} x = \pm 1$$

$$a) \quad \operatorname{tg} x = 1, \quad x = \frac{\pi}{4} + \pi n; \quad б) \quad \operatorname{tg} x = -1, \quad x = -\frac{\pi}{4} + \pi n,$$

$$x = \pm \frac{\pi}{4} + \pi n, \quad n \in \mathbb{Z}$$