Zadatak 2. $\sqrt{2}(\sin^3 x + \cos^3 x) = \sin 2x$.

Rješenje. Zapišimo jednadžbu u obliku

$$\sqrt{2}(\sin^3 x + \cos^3 x) = \sin 2x$$
$$\sqrt{2} \cdot (\sin x + \cos x)\left(1 - \frac{1}{2}\sin 2x\right) = \sin 2x \quad / \cdot \sqrt{2}$$
$$(\sin x + \cos x)(2 - \sin 2x) = \sqrt{2} \cdot \sin 2x \quad /^2$$
$$(\sin^2 x + \cos^2 x + 2\sin x \cos x)(4 + \sin^2 2x - 4\sin 2x) = 2\sin^2 2x$$
$$(1 + \sin 2x)(4 + \sin^2 2x - 4\sin 2x) = 2\sin^2 2x$$
$$\sin^3 2x - 5\sin^2 2x + 4 = 0$$
$$\sin^3 2x - \sin^2 2x - 4\sin^2 2x + 4 = 0$$
$$\sin^2 2x(\sin 2x - 1) - 4(\sin^2 2x - 1) = 0$$
$$\sin^2 2x(\sin 2x - 1) - 4(\sin 2x - 1)(\sin 2x + 1) = 0$$
$$(\sin 2x - 1)(\sin^2 2x - 4\sin 2x - 4) = 0$$

1° $\sin 2x - 1 = 0$

$\sin 2x = 1$

$2x = \frac{\pi}{2} + 2k\pi$

$x_1 = \frac{\pi}{4} + k\pi$

2° $\sin^2 2x - 4\sin 2x - 4 = 0$

$(\sin 2x)_{1,2} = \frac{4 \pm \sqrt{16 + 16}}{2} = \frac{4 \pm 4\sqrt{2}}{2} = 2(1 \pm \sqrt{2})$

$\sin 2x = 2(1 - \sqrt{2}) \approx -0.82843$

(drugo rješenje otpada jer je > 1)

$2x_2 = \arcsin(-0.82843)$

$x_2 = \frac{1}{2}\arcsin(-0.82843)$