Zadatak 4. Koliko je $z_1^{12} : z_2^5$ ako je

$$z_1 = \sqrt{2}\left(-\cos\frac{\pi}{4} + i\sin\frac{3\pi}{4}\right),$$
$$z_2 = 2\sqrt{2}\sin\frac{5\pi}{16} - i2\sqrt{2}\cos\frac{5\pi}{16}?$$

Rješenje.

$$z_1 = \sqrt{2}\left(-\cos\frac{\pi}{4} + i\sin\frac{3\pi}{4}\right) = \sqrt{2}\left(\cos\left(\pi - \frac{\pi}{4}\right) + i\sin\frac{3\pi}{4}\right) = \sqrt{2}\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$$
$$z_2 = 2\sqrt{2}\sin\frac{5\pi}{16} - i2\sqrt{2}\cos\frac{5\pi}{16} = 2\sqrt{2}\left(\cos\frac{3\pi}{16} - i\sin\frac{3\pi}{16}\right)$$
$$= 2\sqrt{2}\left(\cos\frac{29\pi}{16} + i\sin\frac{29\pi}{16}\right)$$
$$\left[\sqrt{2}\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)\right]^{12} : \left[2\sqrt{2}\left(\cos\frac{29\pi}{16} + i\sin\frac{29\pi}{16}\right)\right]^5$$
$$= \left[2^6(\cos\pi + i\sin\pi)\right] : \left[2^{\frac{15}{2}}\left(\cos\frac{17\pi}{16} + i\sin\frac{17\pi}{16}\right)\right]$$
$$= 2^{-\frac{3}{2}}\left[\cos\left(-\frac{\pi}{16}\right) + i\sin\left(-\frac{\pi}{16}\right)\right] = \frac{\sqrt{2}}{4}\left(\cos\frac{31\pi}{16} + i\sin\frac{31\pi}{16}\right).$$