

**Zadatak 7.** Dokaži:

$$1) (1 + i)^n = (\sqrt{2})^n \left( \cos \frac{n\pi}{4} + i \sin \frac{n\pi}{4} \right);$$

$$2) (\sqrt{3} - i)^n = 2^n \left( \cos \frac{n\pi}{6} - i \sin \frac{n\pi}{6} \right).$$

*Rješenje.*

$$1) a = 1, b = 1, |z| = \sqrt{2}, \operatorname{tg} \varphi = 1, \varphi = \frac{\pi}{4};$$

$$(1 + i)^n = \left[ \sqrt{2} \left( \cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right) \right]^n = (\sqrt{2})^n \left( \cos \frac{n\pi}{4} + i \sin \frac{n\pi}{4} \right);$$

$$2) a = \sqrt{3}, b = -1, |z| = \sqrt{1+3} = 2, \operatorname{tg} \varphi = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3} \implies \varphi = \frac{5\pi}{6};$$

$$(\sqrt{3} - i)^n = \left[ 2 \left( \cos \left( -\frac{\pi}{6} \right) + i \sin \left( -\frac{\pi}{6} \right) \right) \right]^n = 2^n \left( \cos \frac{-n\pi}{6} + i \sin \frac{-n\pi}{6} \right) = 2^n \left( \cos \frac{n\pi}{6} - i \sin \frac{n\pi}{6} \right).$$