

71. Izračunaj :  $\left(\frac{1+i\sqrt{3}}{2}\right)^{3000} + \left(\frac{1-i\sqrt{3}}{2}\right)^{3000}$  .

$$\left(\frac{1+i\sqrt{3}}{2}\right)^{3000} + \left(\frac{1-i\sqrt{3}}{2}\right)^{3000} =$$

Ako izraz  $\frac{1+i\sqrt{3}}{2}$  stepenujemo na treći stepen tj. primenimo izraz za kub zbira:

$$(A+B)^3 = A^3 + 3A^2B + 3AB^2 + B^3$$

$$\left(\frac{1+i\sqrt{3}}{2}\right)^3 = \frac{1+3i\sqrt{3}-9-3i\sqrt{3}}{8} = \frac{-8}{8} = -1$$

Ako izraz  $\frac{1-i\sqrt{3}}{2}$  stepenujemo na treći stepen tj. primenimo izraz za kub razlike:

$$(A-B)^3 = A^3 - 3A^2B + 3AB^2 - B^3$$

$$\left(\frac{1-i\sqrt{3}}{2}\right)^3 = \frac{1-3i\sqrt{3}-9+3i\sqrt{3}}{8} = \frac{-8}{8} = -1, \text{ tada imamo:}$$

$$\left(\frac{1+i\sqrt{3}}{2}\right)^{3000} + \left(\frac{1-i\sqrt{3}}{2}\right)^{3000} =$$

$$\left(\left(\frac{1+i\sqrt{3}}{2}\right)^3\right)^{1000} + \left(\left(\frac{1-i\sqrt{3}}{2}\right)^3\right)^{1000} =$$

$$(-1)^{1000} + (-1)^{1000} =$$

$$1+1=2$$