

# FORMULE DI DE MOIVRE

## PRODOTTO

$$Z \cdot W = (x + iy)(a + ib) = ax + a yi + b xi - by$$

$$\begin{aligned} Z \cdot W &= \rho_1(\cos \theta_1 + i \sin \theta_1) \cdot \rho_2(\cos \theta_2 + i \sin \theta_2) = \\ &= \rho_1 \rho_2 (\cos \theta_1 \cdot \cos \theta_2 + i \sin \theta_1 \cdot \cos \theta_2 + i \sin \theta_2 \cdot \cos \theta_1 - \sin \theta_1 \cdot \sin \theta_2) = \\ &= \rho_1 \rho_2 (\cos(\theta_1 + \theta_2) + i \sin(\theta_1 + \theta_2)) \end{aligned}$$

## POTENZA

$$Z^n = [\rho(\cos \theta + i \sin \theta)]^n = \rho^n (\cos n\theta + i \sin n\theta)$$

## RADICE

$$W^n = Z \Rightarrow \sqrt[n]{Z} = W$$

$$[r(\cos \alpha + i \sin \alpha)]^n = \rho(\cos \theta + i \sin \theta)$$

$$r^n(\cos n\alpha + i \sin n\alpha) = \rho(\cos \theta + i \sin \theta)$$

$$r^n = \rho \Rightarrow r = \sqrt[n]{\rho}$$

$$n\alpha = \theta + 2k\pi \Rightarrow \alpha = \frac{\theta + 2k\pi}{n}$$

$$W = \sqrt[n]{\rho} \left( \cos \frac{\theta + 2k\pi}{n} + i \sin \frac{\theta + 2k\pi}{n} \right)$$