Teoria dei Segnali

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$$z = x + jy = \rho e^{j(\theta + 2k\pi)}$$

$$e^{j\theta} = \cos\theta + j\sin\theta; \quad e^{-j\theta} = \cos\theta - j\sin\theta$$

$$x = \rho\cos\theta; \quad y = \rho\sin\theta$$

$$\boxed{\rho^2 = x^2 + y^2 = z \cdot z^*; \quad z^* = x - jy} \qquad \text{In Matlab } z^* = \text{conj}(z);$$

$$\rho = |z| \geq 0 \qquad\qquad \text{In Matlab } \rho = \text{abs}(z);$$

$$\tan\theta = \frac{y}{x} \qquad\qquad \text{In Matlab } \theta = \text{atan2}(y, x) = \text{angle}(z);$$

$$z^n = \left(\rho e^{j\theta}\right)^n = \rho^n e^{jn\theta} = z_0 = \rho_0 e^{j(\theta_0 + 2k\pi)}, \quad n \text{ intero}$$

$$\rho = \left(\rho_0\right)^{\frac{1}{n}}; \quad \theta = \frac{\theta_0}{n} + \frac{2k\pi}{n}, \quad k = 0 \div n - 1$$