

## FUNZIONI ELEMENTARI in $\mathbb{C}$

$$\sqrt[m]{z} = \sqrt[m]{|z|} \cdot \left[ \cos \left( \frac{\text{Arg} z}{m} + \frac{2k\pi}{m} \right) + i \sin \left( \frac{\text{Arg} z}{m} + \frac{2k\pi}{m} \right) \right] \quad k=0, \dots, m-1$$

$$e^z = e^x (\cos y + i \sin y)$$

$$\cos z = \frac{e^{iz} + e^{-iz}}{2}$$

$$\sin z = \frac{e^{iz} - e^{-iz}}{2i}$$

$$\cosh y = \frac{e^y + e^{-y}}{2} \neq 0$$

$$\sinh y = \frac{e^y - e^{-y}}{2} = 0 \text{ se } y = 0$$

$$\text{Log} z = \text{Log} |z| + i \text{Arg} z$$

$$\tanh x = \frac{1 - e^{-2x}}{1 + e^{-2x}}$$

$$z^\alpha = e^{\alpha \cdot \text{Log} z} = e^{\alpha [\text{Log} |z| + i \text{Arg} z]} \quad z = x + iy$$

$$\sin z = \sin x \cosh y + i \cos x \sinh y$$

$$\cos z = \cos x \cosh y - i \sin x \sinh y$$

$$\arcsin z = \frac{1}{i} \text{Log} (iz + \sqrt{1-z^2})$$

$$\arccos z = \frac{1}{i} \text{Log} (iz - \sqrt{1-z^2})$$

$$\text{arctg} z = \frac{1}{2} \text{Log} \left( \frac{i+z}{i-z} \right)$$

$$\text{setg} \sinh z = \text{Log} [z + (z^2 + 1)^{\frac{1}{2}}]$$

$$\text{setg} \cosh z = \text{Log} [z - (z^2 - 1)^{\frac{1}{2}}]$$

$$(\text{arctg} z)' = \frac{1}{1+z^2}$$

$$(\text{setg} \sinh z)' = (1+z^2)^{-\frac{1}{2}} \quad \bullet \quad (\text{setg} \cosh z)' = (z^2-1)^{-\frac{1}{2}}$$