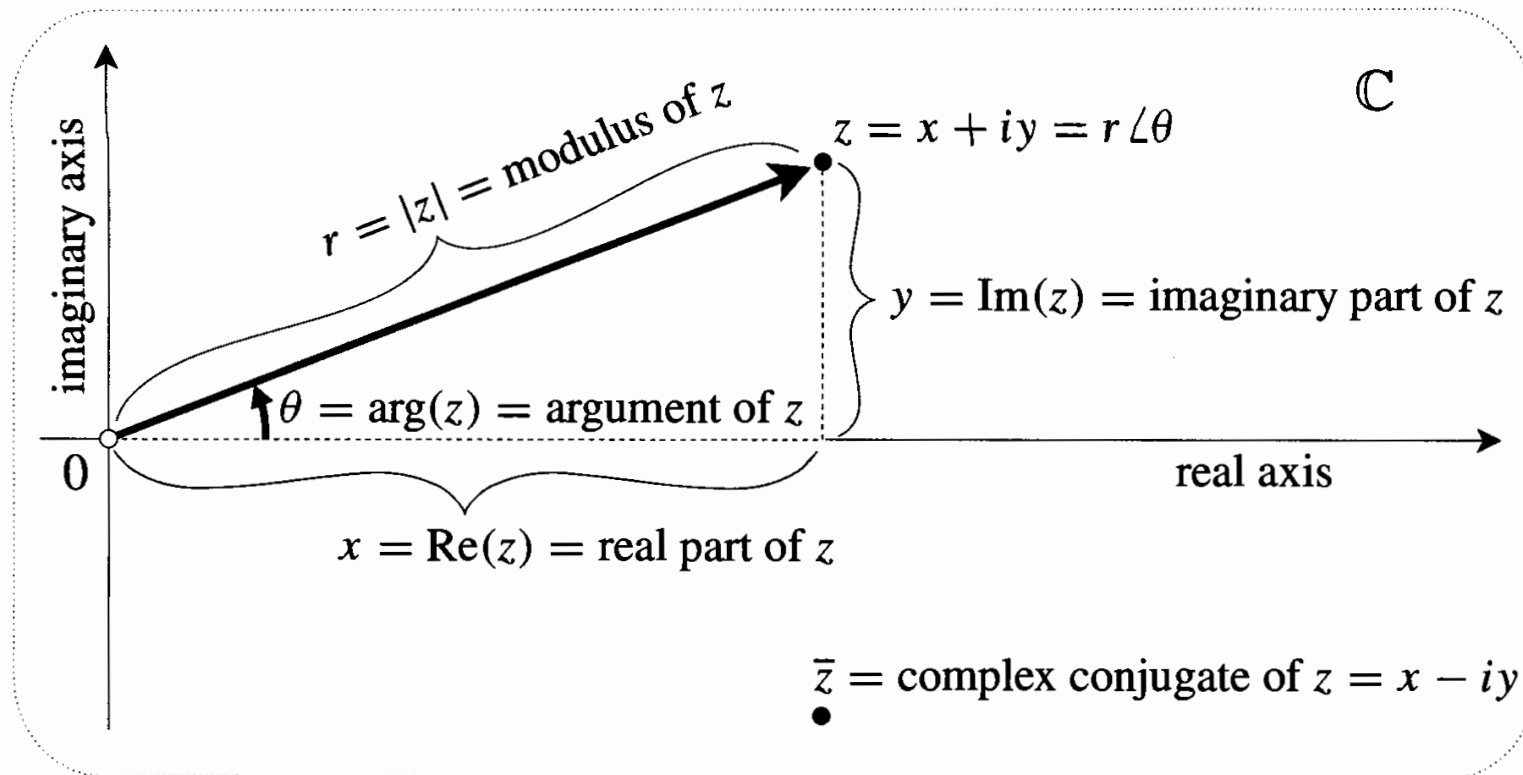
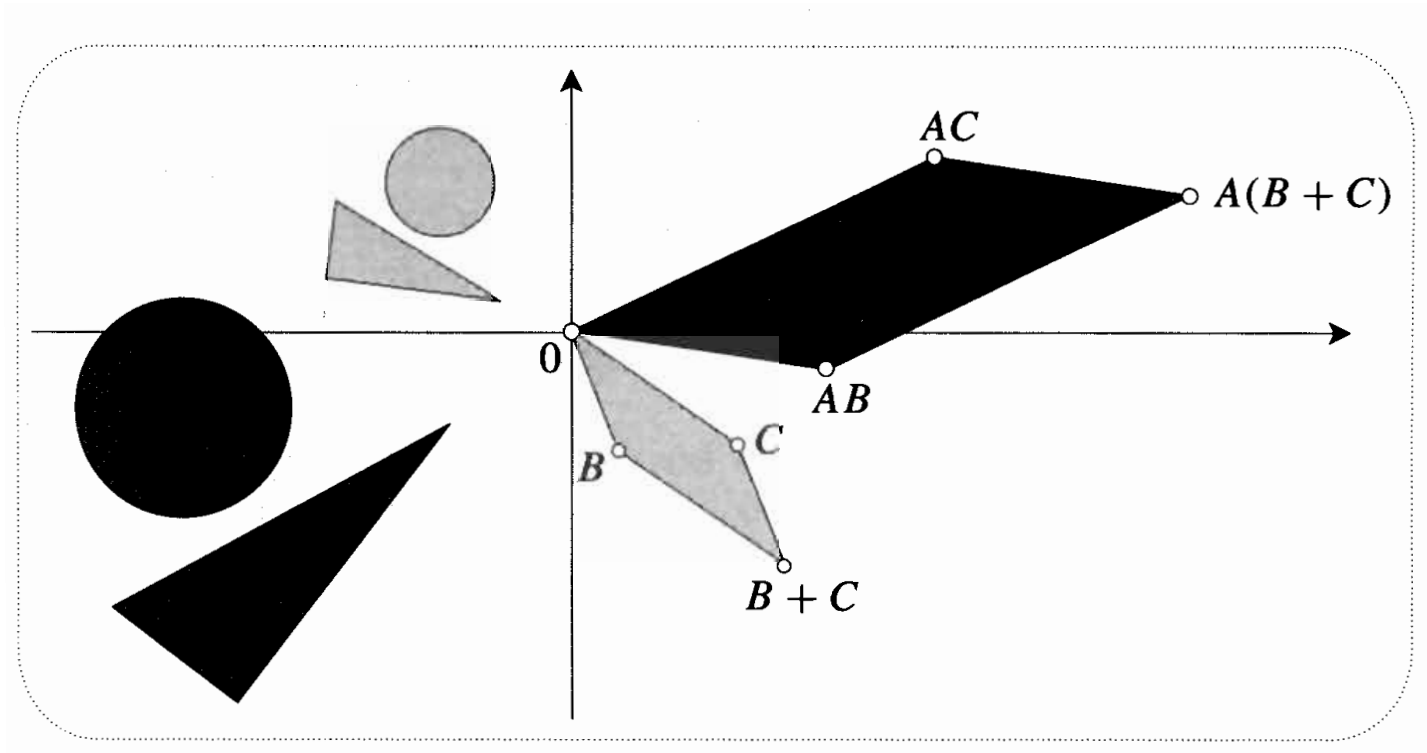


# Aritmetica complessa e geometria

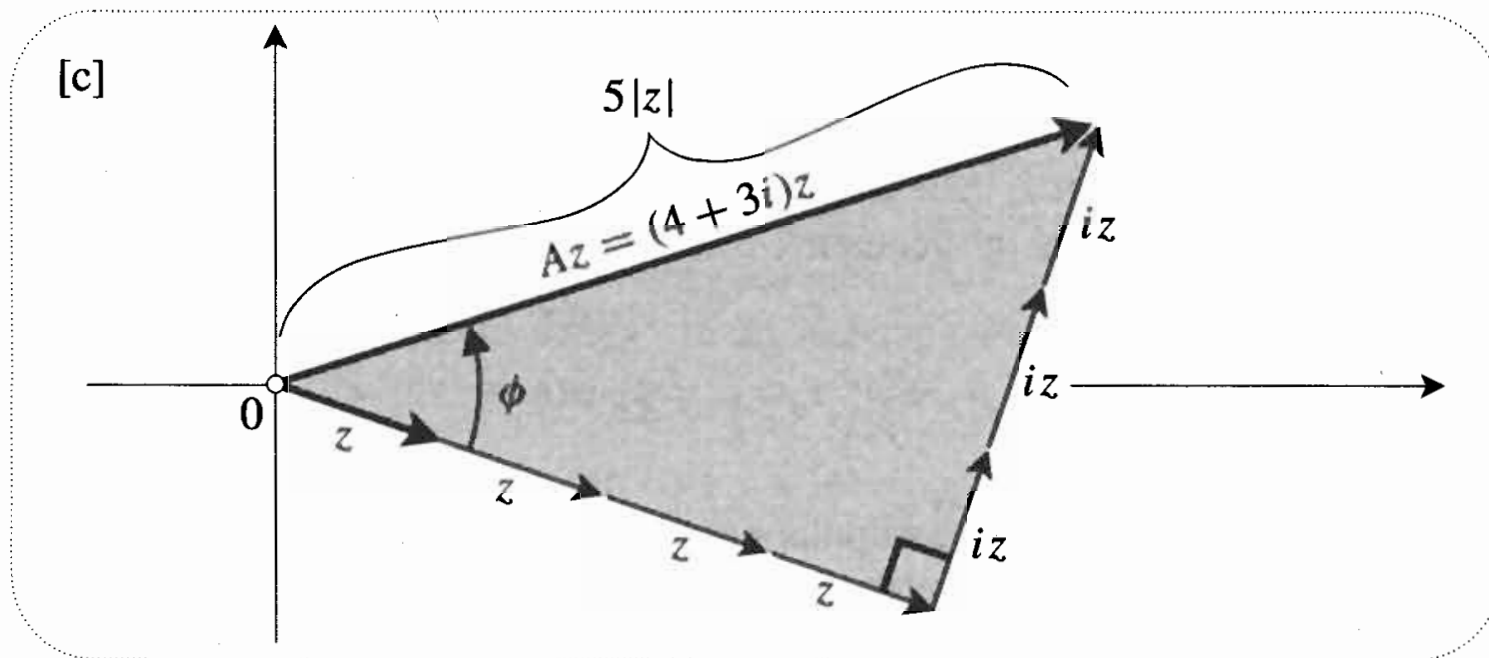
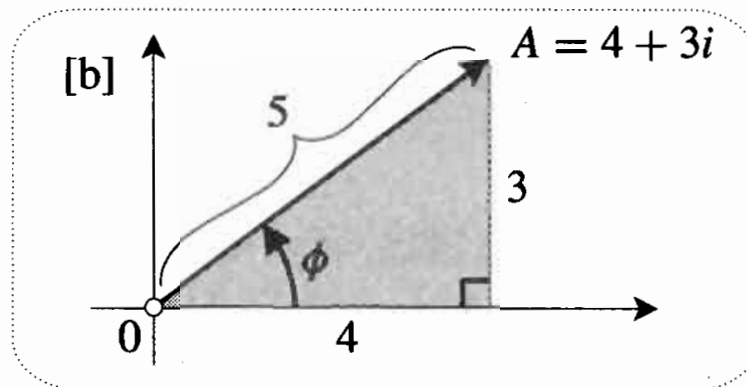
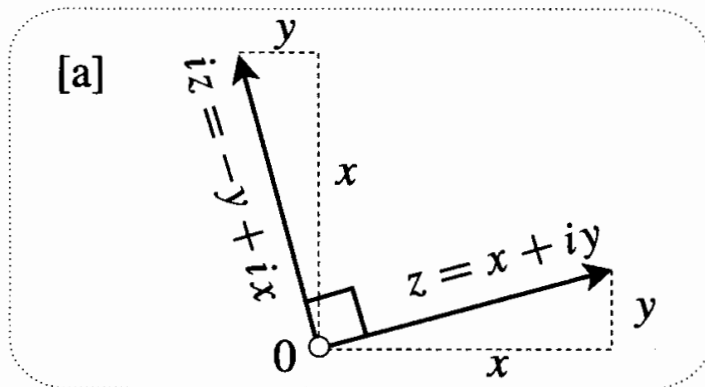
## Terminologia e notazioni



# Equivalenza dell'aritmetica geometrica e simbolica



# Equivalenza dell'aritmetica geometrica e simbolica

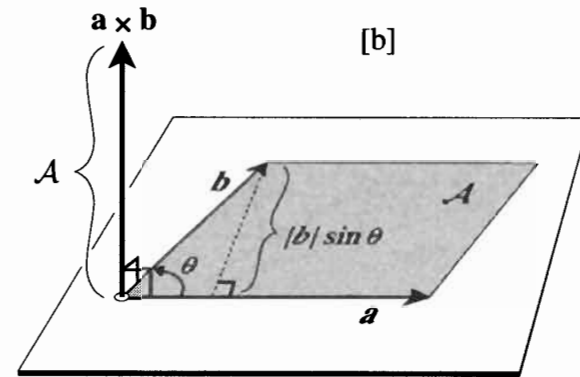
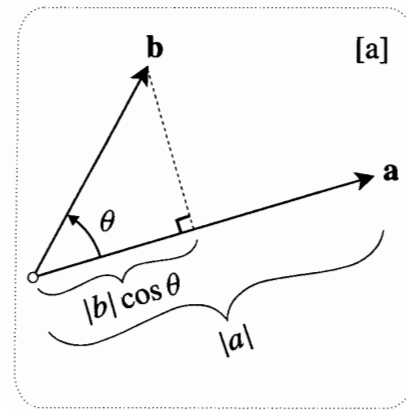


# Operazioni vettoriali

$$z = x + iy \iff \mathbf{z} = \begin{pmatrix} x \\ y \end{pmatrix}$$

$$\mathbf{a} \cdot \mathbf{b} = |\mathbf{a}| |\mathbf{b}| \cos \theta = \mathbf{b} \cdot \mathbf{a},$$

$$\mathbf{a} \times \mathbf{b} = |\mathbf{a}| |\mathbf{b}| \sin \theta = -(\mathbf{b} \times \mathbf{a})$$



$$\bar{a} b = \mathbf{a} \cdot \mathbf{b} + i (\mathbf{a} \times \mathbf{b}).$$

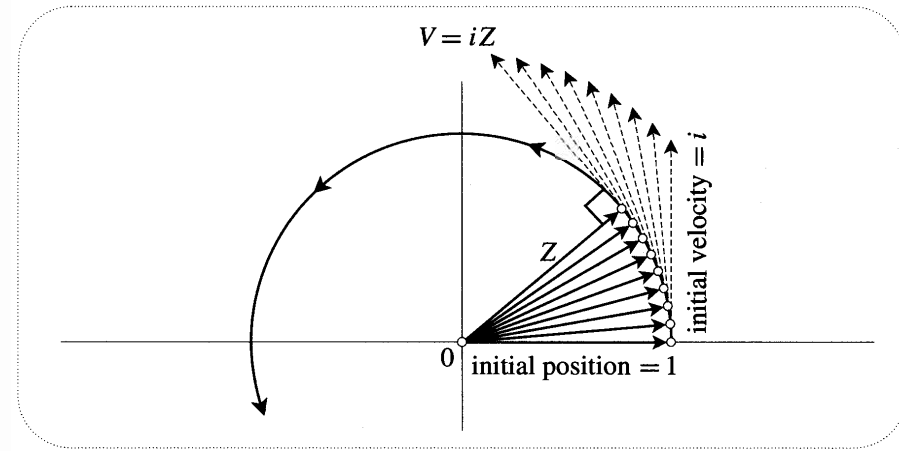
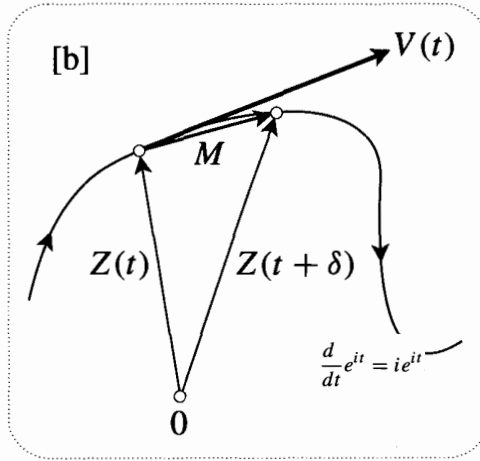
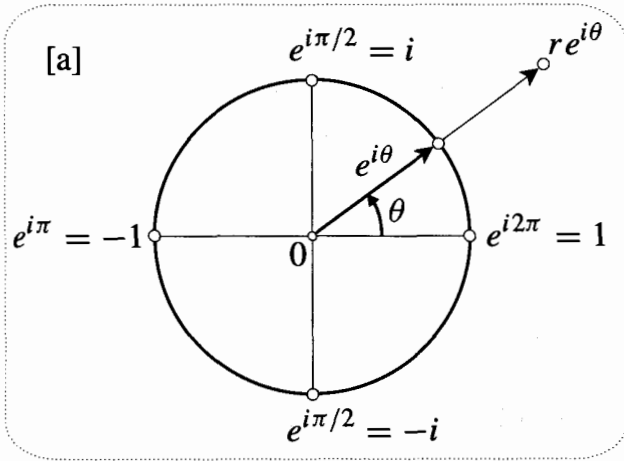
$$\bar{a} b = (|a| e^{-i\alpha})(|b| e^{i\beta}) = |a| |b| e^{i(\beta-\alpha)} = |a| |b| e^{i\theta} = |a| |b| (\cos \theta + i \sin \theta).$$

# La formula di Eulero

$$e^{i\theta} = \cos \theta + i \sin \theta$$

1

$$\frac{d}{dt} e^{it} = i e^{it}$$



$$\frac{d}{dt} Z(t) = \lim_{\delta \rightarrow 0} \frac{Z(t + \delta) - Z(t)}{\delta} = \lim_{\delta \rightarrow 0} \frac{M}{\delta} = V(t)$$

2

$$e^x = f(x) = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots,$$

$$e^{i\theta} = 1 + i\theta + \frac{(i\theta)^2}{2!} + \frac{(i\theta)^3}{3!} + \dots$$

$$\cos \theta = \frac{e^{i\theta} + e^{-i\theta}}{2} \quad \text{and} \quad \sin \theta = \frac{e^{i\theta} - e^{-i\theta}}{2i}$$