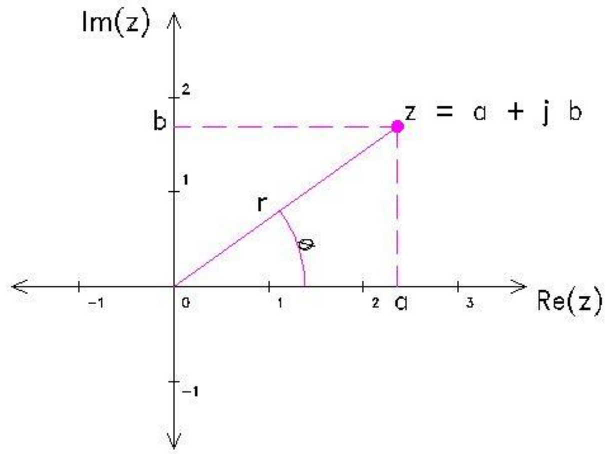
NÚMEROS COMPLEJOS

Representación en el plano complejo:



Forma Cartesiana o rectangular: $z = a + j\,b$

Forma Polar: $\mathrm{z} = \mathrm{r\,e}^{\mathrm{i}\emptyset}$

Relación entre ambas:

- $r = \sqrt{a^2 + b^2}$

  $\emptyset = tg^{-1}\left(\frac{b}{a}\right)\ para\ a > 0 \wedge b > 0$ ó $a > 0 \wedge b < 0$

  $\emptyset = tg^{-1}\left(\frac{b}{a}\right) + \prod\ \ para\ a < 0 \wedge b > 0$ ó $a > 0 \wedge b < 0$

- $a = r\cos(\emptyset)$; $b = r\,sen\,(\emptyset)$

Complejos conjugados: $\mathrm{z} = \mathrm{a} + \mathrm{j\,b} = \mathrm{r\,e}^{\mathrm{i}\emptyset}$; $\mathrm{z}^* = \mathrm{a} - \mathrm{j\,b} = \mathrm{r\,e}^{-\mathrm{i}\emptyset}$

Fórmula de Euler: $\mathrm{e}^{\mathrm{i}\emptyset} = \cos\emptyset + j\,sen\,\emptyset$; $\mathrm{e}^{-\mathrm{i}\emptyset} = \cos\emptyset - j\,sen\,\emptyset$

Fórmulas de seno y coseno

$$\cos \emptyset = \frac{1}{2}(\mathrm{e}^{\,\mathrm{i}\emptyset} + \mathrm{e}^{-\mathrm{i}\emptyset})$$

$$\mathrm{sen}\, \emptyset = \frac{1}{2j}(\mathrm{e}^{\,\mathrm{i}\emptyset} - \mathrm{e}^{-\mathrm{i}\emptyset})$$

Expresiones útiles

$$para \;\; \mathrm{z} = \mathrm{r\,e}^{\,\mathrm{i}\emptyset} \quad ; \; \frac{1}{z} = \frac{1}{r}\,\mathrm{e}^{-\,\mathrm{i}\emptyset}$$

$$donde \;\; \left|\frac{1}{z}\right| = \frac{1}{|z|} \;\; \mathrm{y} \quad \measuredangle \frac{1}{\mathrm{z}} = -\measuredangle \; \mathrm{z}$$