Numere complexe

Un numar complex este de forma z=a+ib,a,b$\in \Re$, unde $i^2 = -1$: $\mathrm{Re}(z) = a, \ln(z) = k$

Operatii cu numere complexe.

Fie $z_1 = a_1 + ib_1$ si $z_2 = a_2 + ib_2$

$z_1 + z_2 = (a_1 + a_2) + i(b_1 + b_2)$:

$z_1 z_2 = (a_1 a_2 - b_1 b_2) + (a_1 b_2 + a_2 b_1)$;

$\frac{1}{z} = \frac{a}{a^2 + b^2} - i\frac{b}{a^2 + b^2}$;

$\frac{z_2}{z_1} = \frac{a_1 a_2 + b_1 b_2}{a_1^2 + b_1^2} - i\frac{a_1 b_2 - a_2 b_1}{a_1^2 + b_1^2}$.

Numere complexe conjugate

$\overline{z} = \overline{a + ib} = a - ib$ se numeste conjugatul numarului complex z=ib

Avem a) $a = \frac{z + \overline{z}}{2}; ib = \frac{z - \overline{z}}{2}$ b) $z \in \Re$ daca si numai daca $z = z + \overline{z}$

c) z este imaginar daca si numai daca $\overline{z} + z$ d) $\overline{\alpha z} = \alpha, \forall \alpha \in \Re$

Fie z=a+ib si $a' + ib'$ doua numere complexe. Avem:

a) $\overline{z + z'} = \overline{z} + \overline{z'}$; b) $\overline{z \cdot z'} = \overline{z} \cdot \overline{z'}$; c) $\frac{z}{z'} = \frac{z \cdot \overline{z'}}{a'^2 + b'^2}, z' \neq 0$