Numere complexe

1 Conjugat

1.1 Definitie

$z = a + bi,\ a, b \in \mathbb{R}$
$\overline{z} = a - bi$

1.2 Proprietati

1. $\overline{z_1 + z_2} = \overline{z_1} + \overline{z_2}$
2. $\overline{z_1 \cdot z_2} = \overline{z_1} + \overline{z_2}$
3. $\overline{z^n} = \overline{z}^n$
4. $\overline{(\frac{z_1}{z_2})} = \frac{\overline{z_1}}{\overline{z_2}}$
5. $z \in \mathbb{R} \Leftrightarrow \overline{z} = z$
6. $z \in i\mathbb{R} \Leftrightarrow \overline{z} = -z$

2 Modul

2.1 Definitie

$z = a + bi,\ a, b \in \mathbb{R}$
$|z| = \sqrt{a^2 + b^2}$

2.2 Proprietati

1. $|z| = 0 \Leftrightarrow z = 0$
2. $|z| = |\overline{z}|,\ \forall z \in \mathbb{C}$
3. $z \cdot |z| = |z|^2,\ \forall z \in \mathbb{C}$
4. $|z_1 \cdot z_2| = |z_1| \cdot |z_2|$
5. $|\frac{z_1}{z_2}| = \frac{|z_1|}{|z_2|}$
6. $|z_1 + z_2| \leq |z_1| + |z_2|$