

Chapter **5**

COMPLEX NUMBERS

Additive inverse of z is $-z$.

For example, If $z = 1 + i$ then additive inverse $-z = -1 - i$.

Multiplicative inverse of z is $\frac{1}{z}$ or z^{-1} .

$$\text{i.e., } z \cdot z^{-1} = z^{-1}z = 1$$

Let $z = x + iy \neq 0 \in \mathbb{C}$ then there exist

$$z^{-1} = \frac{x}{x^2 + y^2} + i \left(\frac{-y}{x^2 + y^2} \right)$$

Such that $zz^{-1} = z^{-1}z = 1$

For example $z = 2 + 3i$ then,

$$z^{-1} = \left(\frac{2}{2^2 + 3^2} \right) + i \left(\frac{-3i}{2^2 + 3^2} \right)$$

$$z^{-1} = \frac{2}{13} + \frac{-3}{13}i$$