

$$(\alpha + \beta) + \lambda = \alpha + (\beta + \lambda), \quad \forall \alpha, \beta, \lambda \in \mathbb{C}$$

Suppose $\alpha = a + bi$, $\beta = c + di$, $\lambda = e + fi$ where $a, b, c, d, e, f \in \mathbb{R}$

$$\begin{aligned}(\alpha + \beta) + \lambda &= ((a + bi) + (c + di)) + (e + fi) \\&= ((a + c) + (b + d)i) + (e + fi) \\&= (a + c + e) + (b + d + f)i \quad (1)\end{aligned}$$

$$\begin{aligned}\alpha + (\beta + \lambda) &= (a + bi) + ((c + di) + (e + fi)) \\&= (a + bi) + ((c + e) + (d + f)i) \\&= (a + c + e) + (b + d + f)i \quad (2)\end{aligned}$$

$$(1), (2) \Rightarrow (\alpha + \beta) + \lambda = \alpha + (\beta + \lambda)$$

□