Axler

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Contents

Chapter 1

Vector spaces

1.1 $\mathbb{R}^n$ and $\mathbb{C}^n$

Definition 1.

- A *complex number* is an ordered pair (a, b), where $a, b \in \mathbb{R}$, but we will write this as $a + bi$.
- The set of all complex numbers is denoted by $\mathbb{C}$:

$$\mathbb{C} = \{a + bi : a, b \in \mathbb{R}\}$$

- *Addition* and *multiplication* on $\mathbb{C}$ are defined by

$$\begin{aligned}(a + bi) + (c + di) =& (a + c) + (b + d)i \\ (a + bi)(c + di) =& (ac - bd) + (ad + bc)i\end{aligned}$$

where $a, b, c, d \in \mathbb{R}$.