

1 Vector Spaces

Linear algebra is the study of linear maps on finite dimensional vector spaces. In linear algebra, complex numbers are necessary for classifying the basic types of linear transformations in terms of their eigenvalues. Eigenvalues arise as solutions to certain polynomial equations.

Complex Numbers

A **complex number** is an ordered pair (a, b) of real numbers. Complex numbers are often written as $a + bi$. The set of all complex numbers is denoted \mathbb{C} .

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