Vector Space Isomorphisms

1 Why

In some sense, $\mathbf{R}^n$ is the only finite-dimensional vector space. In what sense?

2 Definition

An *isomorphism* is an invertible linear transformation between two vector spaces. Two vector spaces are *isomorphic* if there exists and isomorphism between them.

3 Key Result

Proposition 1. *Two finite-dimensional vector spaces are isomorphic if and only if they have the same dimension.*

Corollary 2. *Two finite-dimensional vector spaces are isomorphic if and only if they have the same dimension.*