



## VECTOR SPACE ISOMORPHISMS

### Why

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

### Definition

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

### 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.*

