



Why

All linear transformations are equivalent to multiplication by a matrix.

Main Result

PROPOSITION 1. *Let $(V_1, \mathbf{F}), (V_2, \mathbf{F})$ be two vector spaces and $f : V_1 \rightarrow V_2$ be a transformation between them.*

If f is linear, then there exists bases for the spaces and a matrix A in \mathbf{F} for which matrix multiplication is equivalent to applying f .

If A is a matrix in F f is linear if and only if there exists a matrix in \mathbf{F} whose coordinates in V_1 to coordinates in V_2 .

