

1 | diagonal matrix def

A *diagonal matrix* is a square matrix that is zero everywhere except possibly along the diagonal.

1.1 | results

1.1.1 | every diagonal matrix is upper triangular

2 | diagonalizable def

An operator $T \in \mathcal{L}(V)$ is called *diagonalizable* if the operator has a diagonal matrix with respect to some basis of V .

2.1 | results

2.1.1 | Axler 5.41 conditions equivalent to diagonalizability

Suppose V is finite-dimensional and $T \in \mathcal{L}(V)$. Let $\lambda_1, \dots, \lambda_m$ denote the distinct eigenvalues of T . Then the following are equivalent:

1. T is diagonalizable
2. V has a basis consisting of eigenvectors of T
3. there exist 1-dimensional subspaces U_1, \dots, U_n of V , each invariant under T , s.t.

$$V = U_1$$