= AT , is a symmetric matrix . If instead , A is equal to the negative of its transpose , that is , A = ? AT , then A is a skew @-@ symmetric matrix . In complex matrices , symmetry is often replaced by the concept of Hermitian matrices , which satisfy A ? = A , where the star or asterisk denotes the conjugate transpose of the matrix , that is , the transpose of the complex conjugate of A.

By the spectral theorem , real symmetric matrices and complex Hermitian matrices have an eigenbasis ; that is , every vector is expressible as a linear combination of eigenvectors . In both cases , all eigenvalues are real . This theorem can be generalized to infinite @-@ dimensional situations related to matrices with infinitely many rows and columns , see below .

= = = = Invertible matrix and its inverse = = = =

A square matrix A is called invertible or non @-@ singular if there exists a matrix B such that