

MATRICES

Why

We generalize the notion of real matrices, to matrices with elements in any set.

Definition

Let S be a set. A matrix in S (or of elements in S) is a two-dimensional array in S. In other words, a matrix is a correspondence (function). We call the function's values the entries of the matrix.

As with real matrices, we think of the objects in the codo set as arrayed in a grid or arrayed in a table. We call n and m the dimensions of the matrix. We call n the height and m the width. If the height of the matrix is the same as the width of the matrix then we call the matrix square. If the height is larger than the width, we call the matrix tall. If the width is larger than the height, we call the matrix wide.

Notation

Let S be nonempty set. We denote the set of $n \times m$ S-valued matrices by $S^{n \times m}$. Let $a \in S^{n \times m}$. This means the same as $a : \{1, 2, ..., n\} \times \{1, 2, ..., m\} \to S$. We denote a(i, j) by a_{ij} .

