



FAMILIES

Why

We often use functions to keep track of several objects by the objects of some well-known set with which they correspond. In this case, we use specific language and notation.

Definition

Let I and X denote sets. A *family* is a function from I to X . We call an element of I an *index* and we call I the *index set*. Of course, the letter I was picked here to be a mnemonic for “index”. We call the range of the family the *indexed set* and we call the value of the family at an index i a *term* of the family at i or the *i th term* of the family.

Experience shows that it is useful to discuss sets using indices, especially when discussing a set of sets. If the values of the family are sets, we speak of a *family of sets*. Indeed, we often speak of a *family of* whatever object the values of the function are. So for instance, a family of subsets of X is understood to be a function from some index set into $\mathcal{P}(X)$.

Notation

Let $x : I \rightarrow X$ be a family. We denote the i th term of x by x_i . We sometimes denote the family by $\{x_i\}_{i \in I}$.

