Partitions

1 Why

We divide a set into disjoint subsets whose union is the whole set. In this way we can handle each subset of the main set individually, and so handle the entire set piece by piece.

2 Definition

A *disjoint family* of sets is a family for which the intersection of any two member sets is empty. A *partition* of a set is a disjoint family of subsets of the set whose union is the set. A *piece* of a partition is an element of the family.

We say that the pieces of the partition are *mutually exclusive* (pairwise disjoint) and *collectively exhaustive* (union is full set).

2.1 Notation

No new notation for partitions. Instead, we record the properties of partitions in previously introduced notation.

Let A be a set and $\{A_\alpha\}_{\alpha \in I}$ a family of subsets of A. We

denote the condition that the family is disjoint by $A_\alpha \cap A_\beta = \varnothing$, for all $\alpha, \beta \in I$, We denote the condition that the family union is A by $\cup_{\alpha \in I} A_\alpha = A$.