Sets

Except where otherwise indicated, all sets considered in this book will be *finite*. For a set E, its collection of subsets and its cardinality will be denoted by 2^E and $|E|$, respectively. Frequently, when given a set of subsets of E, we shall be interested in the *maximal* or *minimal members* of $\mathcal{A}$. The former are those members of that are not properly contained in any member of $\mathcal{A}$; the latter are the members of $\mathcal{A}$ that do not properly contain any member of $\mathcal{A}$. The sets of positive integers, integers, rational numbers, real numbers, and complex numbers will be denoted by $\mathbb{Z}^+$, $\mathbb{Z}$, $\mathbb{Q}$, $\mathbb{R}$, and $\mathbb{C}$, respectively. If X and Y are sets, then $X - Y$ denotes the set $\{x \in X : x \notin Y\}$, while $X \triangle Y$ denotes $(X - Y) \cup (Y - X)$, the *symmetric difference* of X and Y. For sets $X_1, X_2, \ldots, X_n$, the notation $X_1 \dot\cup X_2 \dot\cup \ldots \dot\cup X_n$ will refer to the set $X_1 \cup X_2 \cup \ldots \cup X_n$ and will also imply that $X_1, X_2, \ldots, X_n$ are pairwise disjoint. Often, we shall want to add a single element e to a set X or to remove e from X.