Definition 3.40. [1Y2] *Given I a non-empty family of indices and given C_i sets (one for each $i \in I$), then the* ***union***

$$\bigcup_{i \in I} C_i$$

is a set, which contains all (and only) the elements of all sets C_i; in formula[a]

$$\bigcup_{i \in I} C_i \stackrel{def}{=} \{x : \exists i \in I, x \in C_i\} \quad .$$

If only two sets are given C_1, C_2, we usually write $C_1 \cup C_2$ to indicate the union; and similarly when finite sets are given.

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[a] This is a more manageable version of the official axiom. The official definition is located in [026].