



## Why

$$\{a\} \cup \{b\} = \{a, b\}$$

## Definition

Let  $a$ ,  $b$  and  $c$  denote objects. From the associativity of pair unions (see **Pair Unions**), we have

$$(\{a\} \cup \{b\}) \cup \{c\} = \{a\} \cup (\{b\} \cup \{c\}).$$

So we will drop the parentheses, and write  $\{a\} \cup \{b\} \cup \{c\}$ . We call such a set the *unordered triple* of  $a$ ,  $b$  and  $c$ . The unordered triple of  $a$ ,  $b$  and  $c$  is the set containing these elements and no others.

## Notation

Such sets are so commonplace that we denote the unordered triple of  $a$ ,  $b$  and  $c$  by  $\{a, b, c\}$ .

## Quadruples

Let  $d$  denote an object. Again, the associativity of pair unions allows us to drop the parentheses from

$$(((\{a\} \cup \{b\}) \cup \{c\}) \cup \{d\})).$$

We can therefore write  $\{a\} \cup \{b\} \cup \{c\} \cup \{d\}$  without ambiguity. We call this set the *unordered quadruple*. As before, the unordered quadruple contains  $a$ ,  $b$ ,  $c$  and  $d$  and nothing besides these.

§Notation We denote the unordered quadruple of the objects denoted by  $a$ ,  $b$ ,  $c$  and  $d$ , denote this set by  $\{a, b, c, d\}$ .

### **The case of several named objects**

In a similar way we speak of *unordered pentuples*, *unordered sextuples*, *unordered septuples* and so on. If we have several objects named, we denote the set containing these objects by writing their names in between the left brace { and right brace}, separating the names by commas. For example, if we  $A$ ,  $b$ ,  $x$  and  $Y$  and  $z$  denote objects, then we denote the set containing these elements by

$$\{A, b, x, Y, z\}.$$

