### Definition: Difference of Sets

. This is read “ difference .”

Thus, the set contains exactly those elements that occur only in but not in . Let M := {1, 2, 3, 4} and N := {3, 4, 5, 6}MMM\N=∪∩N=N= . Then

#### Example: Union, intersection, and difference of sets

extends over both circles, because the union contains all the elements contained in B A or inA The operations on sets can be illustrated very well by using Venn diagrams. These set diagrams were named after the English mathematician John Venn (1834—1923). The figure below illustrates the various operations using such a graphic representation of two sets and . The shaded area indicates the result of the operation. In the case of a union, this

A

and B. In the difference, the whole circle of A is shaded except the area covered by A B B, or in both. In the intersection, the shaded area is only the middle part where the two circles intersect, because the intersection contains only those elements that occur in both because the difference contains the elements that are only in but not in .

Figure 2: Union (left), intersection (middle), and difference (right) of quantities.

Two sets M and N are called disjoint if M ∩ N = ∅ applies, i.e., the intersection is empty. Disjointdisjoint if they have no

Two sets are said to be

Two disjoint sets have no single common element that occurs in both sets. elements in common.