### Theorem: Relationships of Equivalence Classes

Let M be a non-empty set and let RR be an equivalence relation on L L' M. Let L and L' be

equivalence classes with respect to . Then and are either equal or disjoint.

Proof:

The assertion follows directly from the uniqueness of the equivalence classes which we joint. A third possibility does not exist. □

have previously proved. If two equivalence classes contain a common element, they are identical due to their uniqueness. If they do not contain a common element, they are dis-

Each equivalence relation on a non-empty set thus provides a decomposition of this set into disjoint equivalence classes. The practical thing about equivalence classes is that the choice of an element from them is often arbitrary, as long as one is only interested in the property by which the equivalence relation is defined. Because all elements of a class are equivalent to each other and thus have the same value in the considered property, the selection of a representative is arbitrary. For example, it is completely irrelevant which student we look at in the above example from the group of medical students, if we are only interested in the field of study, because all the people in this group are studying the same thing, namely medicine. This is reflected in the following definition.