### Circular chain of implication

We are often confronted with the task of proving several equivalent statements which all derive from a common premise. We then have to show, for example that statements A1, A2 and A3 are equivalent and equally valid if a precondition A is fulfilled. To do this, we could assume the correctness of A and then prove that A1 → A2, A2 → A1, A1 → A3, A3 → A1, A2 → A3 and A3 → A2. However, this is very complicated as many different individual steps need to be proved. If further statements are added, the necessary effort increases drastically. A more efficient procedure is the utilization of a circular chain of implication. In this case, we simply show that A1 → A2, A2 → A3 and A3 → A1. Thus we can deduct any statement from any other by simply following the implication arrows. A2, for example, results from A3 via A3 → A1 → A2.