

The aim of this diploma thesis is to discuss the explicit calculations of fixed-points in provability logic GL. The fixed-point theorem reads: For every modal formula $A(p)$ such that each occurrence of p is under the scope of \Box , there is a formula D containing only sentence letters contained in $A(p)$, not containing the sentence letter p , such that GL proves $D \leftrightarrow A(D)$. Moreover, D is unique up to the provable equivalence. Firstly, we establish some special cases of the theorem and then we will look more closely at the full theorem. We show one semantic and two syntactic full fixed-point constructions and prove their correctness. We also discuss some complexity aspects connected with the constructions and present basic upper bounds on length and modal depth of the constructed fixed-points.