

Abstract:

The aim of this diploma thesis is to introduce the topic of semifields and to explain its connection with planar functions. From its beginning the thesis leads to the formulation of relation between commutative semifields of odd order and planar Dembowski–Ostrom polynomials, which R. S. Coulter and M. Henderson introduce in their article from 2008. At the beginning of the thesis there is a short introduction to projective and affine planes. The thesis further describes coordinatization of projective plane by planar ternary ring. It also aims to investigate properties of ternary ring depending on the number of perspectivities in the projective plane. One of the chapters is dedicated to the isotopy of loops, which can be applied directly on the isotopy of semifields. The thesis mainly focuses on the proof of denoted correspondence between commutative semifields of odd order and planar Dembowski–Ostrom polynomials. Finally, several corrolaries of this relation and the isotopy of semifields are declared.