

4. Semantics of Residuated Lattices (1 hour)

Peter Jipsen

We will consider canonical extensions of residuated lattices and show how they are related to the duality between residuated frames and complete perfect residuated lattices. This leads to the concept of Gentzen frames as semantics of sequent calculi. Using a general translation of certain identities to structural rules, this connection with sequent calculi can be used to prove that many varieties of residuated lattices have decidable equational theories or even decidable universal theories.

We conclude with some results about enumerating finite nonisomorphic residuated lattices, and about reducts and expansions of residuated lattices, such as residuated semilattices, action algebras and action lattices.