Title

Tarski spectrum for group-like varieties.

Abstract

For a given equational theory Σ, Alfred Tarski defined the set ∇(Σ) as

$$\nabla(\Sigma) = \{|\Sigma_0|: \Sigma_0 \text{ is an independent base for } \Sigma\}$$

where $|\Sigma_0|$ is the cardinality of the set Σ_0 .Tarski's interpolation theorem states that ∇(Σ) is always an interval and that it is unbounded if Σ |– f=x where the term f contains the variable *x* at least twice. Thus, in particular, for any equational theory Σ of groups, we have ∇(Σ) = [1, ω). Tarski's 1968 proof is existential - he uses topological tools like closure operations to show the existence of an independent basis of cardinality *n* for all *n*. In this talk, we give constructive proofs for the Tarksi's "unbounded theorem" for several examples of group-like varieties by constructing independent bases with *n* identities for all *n*.

References

1, Alfred Tarski, *Equational logic and equational theories of algebras*. Contributions to Math. Logic, North-Holland, Amsterdam, 1968.

2. G. Gråtzer and R. Padmanabhan, Symmetric difference in abelian groups, *Pacific J Math* 74 (1978) 339-347.

3. George McNulty, Minimum bases for equational theories of groups and rings, *Ann. Pure Appl. Logic* 127 (2004), 131--153.

4. William McCune and R. Padmanabhan, *Tarski Theorems*, Argonne National Lab Lecture Notes, 2006. (produced under Contract No. W-31-109-ENG-38 with the U.S. Department of Energy).