

Logic Seminar

Internality of autonomous systems of differential equations

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Abstract: When solving a differential equation, one sometimes finds that solutions can be expressed using a finite number of fixed, particular solutions, and some complex numbers. As an example, the set of solutions of a linear differential equation is a finite-dimensional complex vector space. A model-theoretic incarnation of this phenomenon is internality to the constants in a differentially closed field of characteristic zero. In this talk, I will define what this means, and discuss some recent progress, joint with Christine Eagles, on finding methods to determine whether the solution set of a differential equation is internal. As a corollary, we obtain a criterion for solutions to be orthogonal to the constants, and in particular not Liouvillian. I will show a concrete application to Lotka-Volterra systems.

Wednesday, November 13 at 10:00 AM in 304 Taft