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will speak on

The polynomial van der Waerden theorem

ABSTRACT: The classical van der Waerden theorem is a result about the existence of arithmetic progressions in sets; it can be stated as follows: Given a \( c \)-coloring \( \text{COL} \) of \( \mathbb{Z} \) (i.e., a partition of \( \mathbb{Z} \) into \( c \) disjoint subsets) and a positive integer \( k \), there exists \( a, d \in \mathbb{Z} \) with \( d \neq 0 \) such that \( \text{COL}(a) = \text{COL}(a + d) = \text{COL}(a + 2d) = \cdots = \text{COL}(a + kd) \). The polynomial van der Waerden theorem, proven by Bergelson and Leibman, is a generalization which uses polynomials in \( d \) instead of the linear polynomials \( d, 2d, \ldots, kd \).

The original proof of the polynomial van der Waerden theorem involved ergodic techniques and was somewhat difficult. Subsequently, an elementary proof was given by Walters. We will present a simpler version of his proof and discuss even further generalizations.

Monday, October 23, 2006  
Lecture at 4:00 PM (#)  
Coffee, tea, and refreshments from 3-5 PM.  
Room 617, Wachman Building  
Department of Mathematics