

University of Notre Dame Department of Mathematics
LOGIC AND COMBINATORICS SEMINAR

John Engbers

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Will give a lecture entitled:

Roth's Theorem on 3-term Arithmetic Progressions

On

Thursday, March 10, 2011

At

11:00 AM

In

125 Hayes-Healy Hall

Abstract

In 1927, Van der Waerden proved that for if we color $\{1, \dots, n\}$ with k colors, then (for large n) there is an arithmetic progression of length k in which every element in the progression gets the same color. Erdős and Turan conjectured that something stronger was in fact true: for any positive integer k and subset $A \subset \{1, \dots, n\}$ with positive density, A should contain an arithmetic progression of length k (again, for large n). Roth (1953) proved the $k = 3$ case first, and Szemerédi eventually proved the conjecture for general k in 1974; this was the initial application of his Regularity Lemma. In this talk we will use the Regularity Lemma to sketch a proof of Roth's Theorem on 3-term arithmetic progressions.