

Algebra Seminar

Department of Mathematics
The University of Texas at Arlington

Date/Time/Room: Friday (2/13/2009) at 4 p.m. In Room 487 PKH

Speaker: Dr. Zachery Teitler, Department of Mathematics, Texas A&M University

Ranks of polynomials

Abstract: The Waring problem for polynomials asks how to write a homogeneous polynomial of degree d as a sum of d th powers of linear polynomials. The rank of a polynomial is the least number of terms in such an expression. The problem of finding the rank of a given polynomial and studying rank in general has been a central problem of classical algebraic geometry, related to secant varieties; in addition, there are applications to signal processing and computational complexity.

In 1916, Macaulay gave a lower bound for rank in terms of catalecticant matrices. In the almost 100 years since then there has been relatively little progress on the problem of determining or bounding rank (although related questions have proved very fruitful). I will describe new upper and lower bounds for rank, with especially nice results for some examples including monomials and cubic polynomials. This is joint work with J.M. Landsberg.