

Department of Mathematics and Statistics COLLOQUIUM

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What's in a polynomial (or power series)?
A partial history of the notion of 'content',
from 1801 to 2014.

I will discuss some algebraic properties of polynomials (and power series). We consider polynomials $f=f(t)$ whose coefficients lie in various rings R (e.g. the integers, polynomials $g(x,y)$ whose coefficients are rational numbers, etc.). I will introduce the notions of ideals, their products, and the "content" ideal of a polynomial, $c(f)$. It is an interesting problem to study whether content is multiplicative, that is, whether $c(fg)=c(f)c(g)$. For polynomials over the integers, the answer is yes (Gauss, 1801). More generally, it is multiplicative up to a certain factor (Dedekind/Mertens, 1892). This relates to unique factorization and other algebraic properties. I will discuss progress (and setbacks) over the past two centuries, including recent generalizations of both formulas to the case of power series. Previous experience with rings is not assumed.

TUESDAY, OCTOBER 27th

SCIENCE CENTER 199

Refreshments 4:15

Talk 4:30

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