BI-CO MATHEMATICS COLLOQUIUM

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Colgate University

"Characterizing Reconstructible Monomial Orders"

Monday, October 28, 2024
*Talk at 4:15 PM – **Park 300***
Reception at 4:00 PM – Park 361, Math Lounge

*Please note different room for this talk.

Abstract:

When we are asked to write the polynomial $p(x)=3x^2 +x^4 +7-x$ in standard form, we know our answer is x^4+3x^2-x+7, because the only way to order powers of x totally while being consistent with multiplication is the natural one: degree wise! Complexity is introduced when we are asked to write $q(x)=2x^3yz^2-6x^4z+x^2y^3z$ in standard form, and we have to define what standard form means in this setting.

In this talk we will introduce the concept of \textbf{\textit{Monomial Orders}} through examples, discuss the basics of their matrix representations, present the three classical monomial orders (\textit{lexicographic}, \textit{degree lexicographic} and \textit{reverse lexicographic})and explore a curious property they possess (hint: it is in the title), and present results found in joint work with undergraduates in 2016 and 2023 at Amherst College and Colgate University, respectively, seeking to characterize other monomial orders possessing this 'reconstructible' property.

The only background needed for (most of) this talk is basic linear algebra!

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