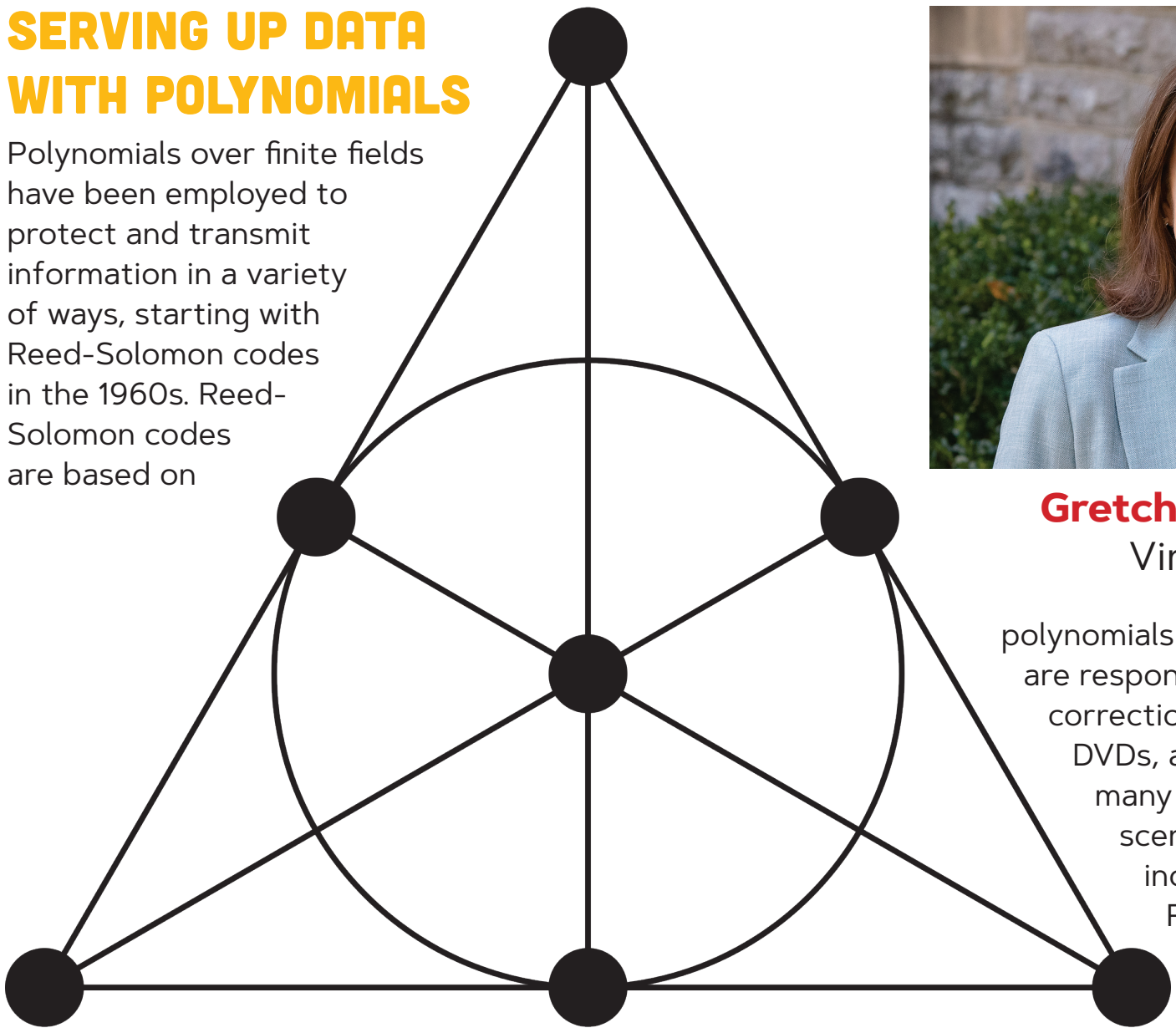
JAMES MADISON UNIVERSITY

SHENANDOAH UNDERGRADUATE MATHEMATICS AND STATISTICS CONFERENCE

SUMS 2024 – Saturday, November 2, 2024

SERVING UP DATA WITH POLYNOMIALS



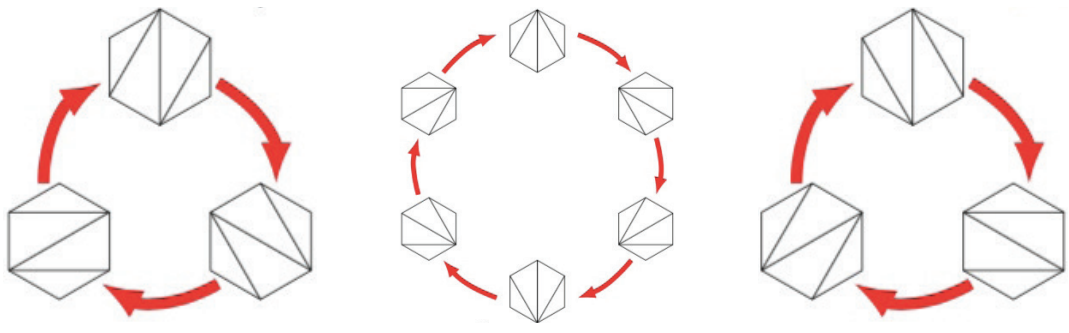
Gretchen Matthews
Virginia Tech

Polynomials over finite fields have been employed to protect and transmit information in a variety of ways, starting with Reed-Solomon codes in the 1960s. Reed-Solomon codes are based on polynomials in a single variable and are responsible for the error-correction that powers CDs, DVDs, and QR codes, among many other behind-the-scenes uses. Generalizations included the famous Reed-Muller codes (which inspired polar codes behind 5G) and algebraic geometry codes. The data deluge of the past decade has prompted a new application. In this talk, we consider the use of polynomials and curves over finite fields to share data with multiple groups simultaneously.

Vic Reiner
University of Minnesota

COUNTING AND CYCLIC SYMMETRY

Part of combinatorics looks for nice formulas to count various objects. Sometimes these formulas hide an added surprise: when we introduce a variable to turn them into a polynomial, they count the objects with cyclic symmetry, after plugging in a complex root-of-unity for the variable! We will illustrate this with some of our favorite examples, including some that we still find mysterious.



Early registration and student submission deadline **October 19**

For more information visit us at:
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