

1116-F5-2229 **Chad Awtrey*** (cawtre@elon.edu) and **Taylor Cesarski**. *Symmetries of polynomial roots*.

Many high school math students are familiar with the quadratic formula. Some may also know there are similar formulas for expressing the roots of cubic and quartic polynomials. But it is unlikely that very many know such formulas do not exist for quintic and higher degree polynomials. Why do no such formulas exist in these cases? This question and its resolution have a fascinating history, culminating in the work of mathematician Evariste Galois. This talk introduces Galois' work to high school math students through a variety of materials that allow students to visualize and compute "symmetries" of polynomial roots. Created by the speaker and one of his undergraduate research students, activities introduce students to relevant history and allow them to discover how roots of polynomials can be permuted to form a group structure. Quadratic and cubic polynomials are the main focus, and only a facility with function composition is required. (Received September 22, 2015)