

1086-AG-1317 **Matt Boelkins*** (boelkinm@gvsu.edu). *Where the Critical Numbers of a Polynomial Aren't.*

For a real polynomial with all real zeros, Rolle's Theorem guarantees that between each pair of zeros, at least one critical number exists; in the situation where a polynomial has complex roots, the Gauss-Lucas Theorem tells us that the critical numbers all lie within the complex hull of the zeros. But within these regions where the critical numbers must lie, are there locations where the critical numbers cannot be?

In this talk, we will survey recent results that answer this question completely for polynomials with all real zeros, as well as complex polynomials of degree 3. For context and intuition, we'll consider several related results and ideas that exemplify the overarching theme that a polynomial's critical numbers are implicit functions of its roots. (Received September 21, 2012)