



UNIVERSITY OF RHODE ISLAND

Department of Mathematics  
and Applied Mathematical Sciences



## Applied Mathematics and Scientific Computing Seminar

**Location:** Lippitt Hall 103

**Time:** Wednesday, December 4, 2024, 10:00am  
(refreshments at 9:55am)

(notice different day, time, and location)

### Finding Roots of Complex Polynomials with Newton's Method

by **Karissa Massud**, M.S. Student

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**Abstract:** Newton's method is a widely recognized numerical technique for approximating the roots of real-valued polynomials. In this work, we introduce the iterative method itself, its accuracy, and some related root-finding methods. We trace the historical development of Newton's method and investigate its extension to the complex plane. We introduce the field of complex dynamics and highlight its connection to the iterative behavior of Newton's method, represented by the mapping  $N_p : \overline{\mathbb{C}} \rightarrow \overline{\mathbb{C}}$ , from the Riemann Sphere to itself. By relating these concepts together, we explore results from Sutherland's work, which demonstrate our interest in understanding the behavior of points under the iteration of the function  $N_p$ .