ABSTRACT

TITLE:	The Shapes of Numerical Ranges of Matrices
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ABSTRACT: We will discuss numerical ranges of matrices, primarily focusing on the shapes they can take. We will present an in depth proof of the Elliptical Range Theorem, the Toeplitz-Hausdorff Theorem and several others. We are particularly interested in normal and almost normal matrices. Much of our research came from papers written by Rudolf Kippenhahn, Chi-Kwong Li, Karl Gustafson, Tyler Moran and Ilya Spikovsky.