1106-15-1881 **Patrick X. Rault*** (rault@geneseo.edu) and **Kristin A. Camenga** (kristin.camenga@houghton.edu), Houghton, NY 14744. *The numerical range of a matrix.*

Let A be an n-by-n matrix with complex coefficients. The numerical range of A, denoted $W(A)$, is the range of the map $x \mapsto \langle Ax, x\rangle$ from the unit sphere in $\mathbb{C}^n$ to $\mathbb{C}$. The set $W(A)$ is a compact, convex subset of the complex plane which contains the eigenvalues of A. We will give a classification of the shapes which $W(A)$ can take for doubly-stochastic 4-by-4 matrices A. In addition, we will apply numerical ranges to solve a question about the maximal compression of some n-by-n matrices. (Received September 15, 2014)