

Meeting: 1003, Atlanta, Georgia, MAA IPS Z2, MAA Invited Paper Session on Worlds of Interactive Mathematics, Part I: The Legacy of Elias Deeba

1003-Z2-1610 **M. Zuhair Nashed*** (znashed@mail.ucf.edu), Department of Mathematics, University of Central Florida, Orlando, FL 32816-1364. *Linear Relations*.

Let X and Y be (real or complex) vector spaces and let Z denote their Cartesian product. A subspace M of Z is called a linear relation. We identify M also as the graph of a multi-valued linear mapping. In this talk we consider some aspects of linear relations and their algebraic operator parts or (single-valued) selections. We describe problems and interactive projects. We highlight some of the properties of linear relations which differ markedly from (single-valued) linear transformations. The theory of linear relations in functional analysis was initiated by John von Neumann, but some of the algebraic aspects complement topics in undergraduate linear algebra. (Received October 05, 2004)