1067-P1-2376 **Matthew P Conlen*** (`mpconlen@umich.edu`) and **Juraj Milcak**. *A Winning Strategy for Tic-Tac-Toe on an Affine Plane of Order 4.*

Our research looks at the classic game Tic-Tac-Toe as played on finite geometries, in particular the affine plane of order 4. J. Yazinski and A. Insogna have given a computational proof that this game may always be won by the first player. We provide a simple winning strategy and proof of its correctness. To do so, we use mutually orthogonal latin squares to coordinatize points and place lines into parallel classes. Consider any subgraph of the game board such that the subgraph is itself an affine plane of order two. We denote the set of points of any such subgraph as S. We prove that the first player is always able to create a set S, and then show that this set can be extended to produce a winning line. (Received September 22, 2010)