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*The Orthogonal Colouring Game on Graphs*

Lois and Rita are playing with two  $n \times n$  matrices, one labeled L and one labeled R. On their turn, a player can write in an integer between 1 and  $n$  in either matrix. However, the matrices must have the latin property (no row or column can have a repeated number) and the two matrices must be orthogonal (no pair of numbers can be repeated). When no moves are available the game is over and Lois's (Rita's) score is the number of entries in the matrix L (R). The player with the greater score wins. We'll assume that Lois play's first. When  $n = 2$ , Rita can force a win. For other  $n$ , Rita has a strategy that ensures a tie, even if the entries are restricted to 1 through  $k$  with  $k < n$ .

This game can be extended to playing on graphs. We characterize, via matchings, a class of graphs in which Rita can always tie.

This is joint work with Sephan Andres, Melissa Huggan and Fionn Mc Inerney.