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Don L Hancock* (don.hancock@pepperdine.edu). *Using the Banach-Mazur Game in an Undergraduate Real Analysis Class to Investigate Different Types of Infinite Sets.*

The distinction between countably infinite and uncountable sets of real numbers is especially significant in real analysis. For example, the set of discontinuities of a function f cannot be uncountable when f is monotonic, although it may be when f is Riemann-integrable or a derivative. It is in real analysis that most students get their initial exposure to some subtler aspects of infinite sets, with many finding this material nonintuitive and challenging. In this talk I will describe the simple Banach-Mazur mathematical game, unfamiliar to many teachers and not found in standard texts, and show how this game can be used as a classroom tool in real analysis. For example, I use the game to easily prove that the irrationals are uncountable and to motivate Cantor sets and the notion that infinite sets may be "large" in one sense yet "small" in some other. Finally, the game is used to establish that a nondegenerate interval cannot be of Baire first category, and several applications appropriate for a real analysis course are suggested. (Received August 09, 2011)