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THREE NEW R’S: RANDOM WALKS, RIORDAN ARRAYS, AND RNA SECONDARY STRUCTURE

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In this talk we use an algebraic and combinatoric technique, which is based on Riordan arrays, to count two classes of random walks. It is interesting that certain subsets of the walks are counted by the RNA numbers $\{1, 1, 1, 2, 4, 8, 17, 37, \dots\}$. These numbers also count RNA secondary structures of length n from molecular biology. A bijection is constructed between the set of RNA structures of length n and a subset of random walks of a given length and height. Asymptotic and probabilistic results are also given as well as other appearances of the RNA numbers that involve the classical Narayana numbers and Berstein-Sloane inverse sequences.