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Chris D. Lynd* (chris@math.uri.edu), RI. *Using Difference Equations to Generalize Results for Periodic Nested Radicals.*

We investigate sequences of nested radicals where the indices, the coefficients, and the radicands are periodic sequences of real numbers. We show that one can determine the end behavior of a periodic nested radical by analyzing the basin of attraction of each equilibrium point, and each period-2 point, of the corresponding difference equation. Using this method of analysis, we prove a few theorems about the end behavior of nested radicals of this form. These theorems extend previous results on this topic because they apply to large classes of nested radicals that contain arbitrary indices, negative radicands, and periodic parameters with arbitrary periods. In addition, we demonstrate how to construct a periodic nested radical, of a general form, that converges to a predetermined limit; and we demonstrate how to construct a nested radical that converges asymptotically to a periodic sequence. (Received September 10, 2012)