

Qualitative approximation of solutions to difference equations

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We present a new approach to the theory of asymptotic properties of solutions to difference equations. Usually, two sequences x, y are called asymptotically equivalent if the sequence $x - y$ is convergent to zero i.e., $x - y \in c_0$, where c_0 denotes the space of all convergent to zero sequences. We replace the space c_0 by various subspaces of c_0 . Our approach is based on using the iterated remainder operator. Moreover, we use the regional topology on the space of all real sequences and the ‘regional’ version of the Schauder fixed point theorem.

- [1] Migda, J., Approximative solutions of difference equations, *Electron. J. Qual. Theory Differ. Equ.* 13 (2014), 1–26.
- [2] Migda, J., Iterated remainder operator, tests for multiple convergence of series and solutions of difference equations, *Adv. Difference Equ.* (2014), 2014:189, 1-18.
- [3] Migda, J., Qualitative approximation of solutions to difference equations, *Electron. J. Qual. Theory Differ. Equ.* 32 (2015), 1–26.