On the Second Order Rational Difference Equation
$$x_{n+1} = \beta + \frac{1}{x_n x_{n-1}}$$

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The author investigates the local and global stability character, the periodic nature, and the boundedness of solutions of one of the second-order rational difference equation in form

$$x_{n+1} = \beta + \frac{1}{x_n x_{n-1}}, \quad n = 0, 1, ..., \tag{1}$$

with parameter β and with arbitrary initial conditions such that the denominator is always positive. In the paper [1] are given several open problems and conjectures about these equations:

Conjecture 8.1. Every positive solution of (1) has a finite limit.

Open Problem 8.2. Assume that β is a real number. Determine the set G of real initial values x_{-1}, x_0 for which the equation (1) is well defined for all $n \geq 0$, and investigate the character of solutions of (1) with x_{-1}, $x_0 \in G$.

In this talk the author would like to pose some ideas how to solve these problems.

References

[1] A.M.Amleh, E.Camouzis, G.Ladas, *On the Dynamics of a Rational Difference Equations. Part 1*, Int.J.Difference equation **3** (1), 1–35, 2008.