Dynamics of Continuous, Discrete and Impulsive Systems
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ON THE RECURSIVE SEQUENCE

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Abstract. In this paper, we are going to analyze the following difference equation

$$x_{n+1}=\frac{x_{n-17}}{1+x_{n-1}x_{n-3}x_{n-5}x_{n-7}x_{n-9}x_{n-11}x_{n-13}x_{n-15}} \quad n=0,1,2,...$$

where $x_{-17},x_{-16},x_{-15},...,x_{-2},x_{-1},x_0\in(0,\infty)$.

Keywords. Rational difference equation, difference equation, recursive sequence.

AMS (MOS) subject classification: 39A10

1 INTRODUCTION

Difference equations and dynamic equations have an immense possibility for applications in engineering, physics, biology, economics, etc. Lately, considerable attentiveness has been devoted to the oscillation theory of the various classes of equations,see e.g. [1]-[50] and the references cited therein.

This paper studies the dynamics of the solutions of difference equations satisfying

$$x_{n+1}=\frac{x_{n-17}}{1+x_{n-1}x_{n-3}x_{n-5}x_{n-7}x_{n-9}x_{n-11}x_{n-13}x_{n-15}} \tag{1}$$

where the initial conditions are arbitrary nonzero real numbers.

Aloqeili, [4] has obtained the solutions of the difference equation

$$x_{n+1}=\frac{x_{n-1}}{a-x_nx_{n-1}}.$$

Cinar, studied the following problems with positive initial values:

$$x_{n+1}=\frac{x_{n-1}}{1+ax_nx_{n-1}}, \qquad x_{n+1}=\frac{x_{n-1}}{-1+ax_nx_{n-1}},$$

for $n=0,1,2,...$ in [8, 9] respectively.