

SOLUTION OF A RATIONAL DIFFERENCE EQUATION

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Abstract. In this work a solution for the following difference equation $x_{n+1} = \frac{x_{n-11}}{1+x_{n-5}}$ was investigated, where $x_{-11}, x_{-10}, x_{-9}, x_{-8}, x_{-7}, x_{-6}, x_{-5}, x_{-4}, x_{-3}, x_{-2}, x_{-1}, x_0 \in (0, \infty)$.

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1 Introduction

The studies on difference equations have been increased steadily in last decade. This is largely due to the fact that difference equations present themselves as mathematical models in generating solutions for real life situations in probability, number and queuing theories, statistical problems, stochastic time series, combinatorial analyzes, geometry, electrical network, quanta in radiation, genetics in biology, economics, psychology, sociology, etc. In fact, it now occupies a central position in applicable analyzes and there is no doubt that it will continuously play important roles in mathematics as a whole. Nowadays, there is a growing interest in studying the periodic nature of nonlinear difference equations. For some recent results concerning about problems related with the periodic nature of scalar nonlinear difference equations look at the examples [1 – 25].

Cinar, studied the following problem with positive initial values

$$x_{n+1} = \frac{x_{n-1}}{-1 + ax_n x_{n-1}}$$

for $n = 0, 1, 2, \dots$ in [2] respectively.