

PROBLEM OF THE WEEK-7

Posting Date 4/25/03. Submit solutions to Noah Aydin, RBH 309-A (e-mail or hard-copy) by 4 pm on 5/9/03.

Starting with a positive real number $x_0 = a$, let x_n be the sequence of real numbers defined by

$$x_{n+1} = \begin{cases} x_n^2 + 1 & \text{if } n \text{ is even} \\ \sqrt{x_n} - 1 & \text{if } n \text{ is odd} \end{cases}$$

For what values of a will there be terms of the sequence arbitrarily close to 0?

Justify your answer.