Asymptotic and boundedness behaviour of a rational difference equation

ABSTRACT

In this work, we investigate the asymptotic behaviour and examine boundedness of the solutions for the following difference equation $x_{n+1}=\alpha\lambda-(nx_n+(n-k)x_{n-k})\beta+nx_n+(n-k)x_{n-k}, n=0,1,2,\ldots(1)$ where $\lambda\geq 1$ and $\alpha,\beta\geq 0$ and $x_{-k},x_{-(k-1)},\ldots,x_{-1},x_0$ are arbitrary numbers.

Keyword: Equilibrium point; Asymptotic stability; Boundedness; Positive solutions