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For nonnegative parameters $\alpha, \beta, \gamma, A, B, C$ such that $A + B + C > 0$, consider the difference equation

$$x_{n+1} = \frac{\alpha + \beta x_n + \gamma x_{n-1}}{A + Bx_n + Cx_{n-1}}, \quad n = 0, 1, 2, \dots, \quad (x_{-1}, x_0) \in R \quad (\text{E})$$

where either $R = [0, \infty)^2 \setminus \{(0, 0)\}$ if $A = 0$, or $R = [0, \infty)^2$ if $A > 0$.

We give a complete qualitative description of the global behavior of solutions for all nonlinear difference equations (E) for which prime period-two solutions exist. (Received August 20, 2008)