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CLOSED FORM SOLUTIONS OF SOME SYSTEMS OF RATIONAL DIFFERENCE EQUATIONS IN TERMS OF FIBONACCI NUMBERS

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Abstract. In this paper we deal with the form of the solutions of the two following systems of rational difference equations

$$x_{n+1}=\frac{y_n(x_{n-2}+y_{n-3})}{y_{n-3}+x_{n-2}-y_n},\ y_{n+1}=\frac{x_{n-1}(x_{n-1}+y_{n-2})}{2x_{n-1}+y_{n-2}}$$

$$x_{n+1}=\frac{(y_{n-3}-x_{n-2})y_n}{y_{n-3}-x_{n-2}+y_n},\ y_{n+1}=\frac{(y_{n-2}-x_{n-1})x_{n-1}}{y_{n-2}}$$

where $n\in\mathbb{N}_0$ and the initials conditions are arbitrary nonzero real numbers.

Keywords. Periodic solutions; systems of difference equations; Fibonacci numbers.

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