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# Numerical Range and Bifurcation Points of a Family of Rational Function

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## Abstract

Using the Numerical Range Theory we make some interesting observations about the behavior of the dynamics of the family of rational function  $f_\lambda(x)$  given by

$$f_\lambda(x) = 1 - \frac{2\lambda}{x^2 + \lambda - 4}$$

in the neighborhood of the bifurcation point.

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## Numerical Range and Bifurcation Points of a Family of Rational Function

Helena Melo and João Cabral

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in the neighborhood of the

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## 1 Introduction

The goal of this work is to propose an alternative new study for the family of real rational maps

$$f_{\lambda}(x) = 1 - \frac{2\lambda}{x^2 + \lambda - 4} \quad (1)$$

applying the Numerical Range Theory to the dynamics of the map  $f_{\lambda}$  through iteration.

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H. Melo (✉) • J. Cabral

Universidade dos Açores, Ponta Delgada, Portugal

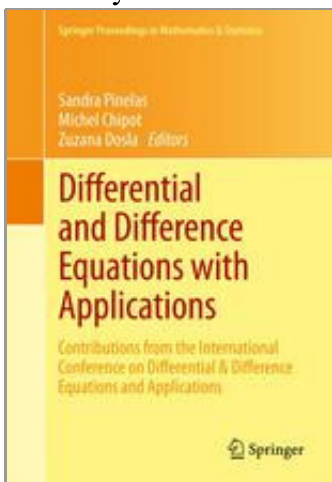
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### References (2)

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2. Milnor, J.: *Geometry and Dynamics of Quadratic Rational Maps, with an Appendix*. In: Milnor, J., Lei, T (eds.) A.K. Peters, Ltd, Wellesley (1993)

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## Editor Affiliations

- 1. Departamento de Ciências Exactas e Naturais, Academia Militar
- 2. University of Zürich Institute of Mathematics
- 3. Masaryk University Dept. Mathematics

## Authors

- Helena Melo <sup>(4)</sup>
- João Cabral <sup>(4)</sup>

## Author Affiliations

- 4. Universidade dos Açores, Ponta Delgada, Portugal

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