Complex dynamics

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Let us consider a sequence of complex numbers given by a recurrence relation, for example, those given by the Newton's method for finding roots of complex polynomials. Ones usually need to determine whether the sequence is convergent, or even more generally how the sequence behaves when the initial value changes. We don't have a simple answer to this seemingly elementary question. The quest for understanding it has a rich history and has led to a marvelous mathematical field called complex dynamics. The aim of the course is to provide basics of this theory. Main references for the course are [1, 2, 3, 4, 5]. A minimal prerequisite is required. Students should have basic knowledge from Complex Analysis, Linear Algebra, and Analysis I-III.

References

[1] A. F. BEARDON, *Iteration of rational functions*, vol. 132 of Graduate Texts in Mathematics, Springer-Verlag, New York, 1991. Complex analytic dynamical systems.

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[3] L. CARLESON AND T. W. GAMELIN, *Complex dynamics*, Universitext: Tracts in Mathematics, Springer-Verlag, New York, 1993.

[4] J. MILNOR, *Dynamics in one complex variable*, vol. 160 of Annals of Mathematics Studies, Princeton University Press, Princeton, NJ, third ed., 2006.

[5] T. RANSFORD, *Potential theory in the complex plane*, vol. 28 of London Mathematical Society Student Texts, Cambridge University Press, Cambridge, 1995.