Dynamics of the King and Jarratt iterations

The purpose of this article is to present results that amount to a description of the conjugacy classes of two forth–order root–finding iterative methods, the King and the Jarratt iterations, for complex polynomials of degrees two, three and four. For degrees two and three, a full description of the conjugacy classes is accomplished, in each case, by a one–parameter family of polynomials. This is done in such a way that, when one applies one of these two root–finding iterative methods to the elements of these parametrized families, a family of iterative methods is obtained, and its dynamics represents, up to conjugacy, the dynamics of the corresponding iterative root–finding method applied to any complex polynomial having the same degree. For degree four, partial results analogous to the ones just described are presented.

Key Words. King and Jarratt iterative methods, dynamics, rational maps, conjugacy classes.

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