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Rational functions and finite permutation groups

A complex rational function of degree n describes a branched covering of Riemann spheres, whose monodromy group is a transitive permutation group on n letters. The ramification data of this covering yields a specific generating system of this group.

Over arbitrary fields one obtains a similar setting by Galois theory. However, if the base field has positive characteristic, less precise information about these groups is available.

We give some historic and recent examples where combinatorial and group theoretic techniques can be used to answer geometric and number theoretic questions about polynomials and rational functions.

Rational functions with only three critical values, so called Belyi functions, have a nice graph theoretic description, called dessins d'enfants by Grothendieck, or Linienzüge by Felix Klein much earlier.

A contemporary activity is the explicit computation of group theoretically interesting rational functions from these graphs. We sketch several possible approaches.

Finally, we sketch an application of an elementary group theoretic lemma to settle a recent question about invariant curves in complex analysis.

Ort: Raum 30.02.003 (2. Stock) (Mathegeb. 30 West)   Zeit: Montag, 01.02.2016, 14.00 Uhr

Zu diesem Vortrag laden wir Sie herzlich ein.

gez. Prof. Dr. Alfio Borzi
gez. Prof. Dr. Roland Griesmaier