

Title: Geometry of the complex projective line

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Abstract: This thesis deals with the geometry of the complex projective line and its fundamental properties from the perspective of Möbius geometry. The complex projective line is first precisely defined and then geometrically interpreted via stereographic projection as the Riemann sphere. The thesis further studies Möbius transformations as projective automorphisms of the complex projective line, their decomposition into elementary transformations, and their basic properties, in particular the preservation of circular curves, conformality, and continuity. The thesis also examines the cross ratio of four points as an important invariant of projective geometry and its application to the solution of geometric problems.

Keywords: complex projective line, Möbius transformation, stereographic projection, cross-ratio