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Explicit equations and automorphisms of cyclic trigonal Riemann surfaces

Abstract A cyclic trigonal surface X is a Riemann surface that possesses an automorphism σ of order three such that $X/\langle\sigma\rangle = \mathbb{C}$. It is known that if the genus of X is greater than four, then $\langle\sigma\rangle$ is unique and normal in the full automorphism group G of X . We determine explicit defining equations for each cyclic trigonal surface of genus greater than four. In addition, we explicitly determine generators for the automorphism group of each surface. Where possible, we try to associate the surfaces found with those that appear (without defining equations) in the literature.