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Alma Masic: Existence of Solutions to Ordinary Differential Equations

Sammanfattning

Differential equations are applied in many sciences and can be used in many ways. This report takes up ordinary differential equations and the existence of their solutions. Along with necessary theory, the report focuses on two important theorems: Picard's Theorem, that asserts the uniqueness of a solution, and Peano's Theorem, that gives the existence of at least one solution. The first can be proved by successive iterations, but also by the Contraction Mapping Principle, and the latter by approximations (and the Arzelà-Ascoli Theorem), but also by the Schauder Fixed Point Theorem.