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Kolloquium Logik und Sprachtheorie
Dr. Reinhard Kahle

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Vortragsankündigung

Dr. Matthias Baaz

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Die Verallgemeinerung von Beweisen und Rechungen

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Abstact:

L. Euler proved by a famous calculation that $F_5 = 4294967297$ is composite.

$$2^{2^5} + 1 = 641 \cdot 6700417$$

We presents a logical method to extract the general content of calculations. This generalizations are applied to characterize the difference between the mathematical insight that is used in the first factorization and the division carrying no additional information.

Generalization of proofs

We compare the generalization of calculations to the generalization of short proofs, i.e., proofs of theorems in a fixed number of steps containing complex terms, in various circumstances, namely relative to different axiom systems and to different formulations of the underlying (classical) logical system. Results about generalizations provide a way to distinguish between different proof systems for one and the same theory, i.e., to distinguish between formulations which are indistinguishable by model theoretic properties.

Usually, generalizations of theorems are considered, e.g., Kreisel's Conjecture: If there is a k so that $A(s^n(0))$ is provable in k steps in Peano Arithmetic, then $(\forall x)A(x)$ is provable. The important aspect, however, is generalization of proofs and the circumstances and conditions under which it is possible. Generalization of theorems, then, can be viewed as a borderline case of generalization of proofs, where every sound proof transformation is allowed.

`http://www-ls.informatik.uni-tuebingen.de/logik/Kolloquium/index.html`