

Problem #41 (Solved !)

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Summary: What is the complexity of the first-order theory of trees?

The complexity of the theory of finite trees when there are finitely many symbols is known to be PSPACE-hard [Mah88]. Is it in PSPACE? The same question applies to infinite trees.

Remark

The problem is non-elementary [Vor96].

Bibliography

- [Mah88] Michael J. Maher. Complete axiomatizations of the algebras of the finite, rational and infinite trees. In Yuri Gurevich, editor, *Third Symposium on Logic in Computer Science*, pages 348–357, Edinburgh, Scotland, July 1988. IEEE.
- [Vor96] Sergei Vorobyov. An improved lower bound for the elementary theories of trees. In M. A. McRobbie and J. K. Slaney, editors, *13th International Conference on Automated Deduction*, Lecture Notes in Computer Science, pages 275–287, New Brunswick, NJ, July/August 1996. Springer-Verlag.