

## Problem #46

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*Summary: For which equational theories is ground reducibility of extended rewriting decidable?*

Ground reducibility of extended rewrite systems, modulo congruence, like associativity and commutativity (AC), is undecidable [KNZ87]. For left-linear AC systems, on the other hand, it is decidable [JK89]. What can be said more generally about restrictions on extended rewriting that give decidability? This problem is related to Problem #25.

### Remark

Progress has been made in [KR94], where it is proven that ground reducibility remains undecidable when a single non-constant function symbol is associative.

# Bibliography

- [JK89] Jean-Pierre Jouannaud and Emmanuel Kounalis. Automatic proofs by induction in equational theories without constructors. *Information and Computation*, 81(1):1–33, 1989.
- [KNZ87] Deepak Kapur, Paliath Narendran, and Hantao Zhang. On sufficient completeness and related properties of term rewriting systems. *Acta Informatica*, 24(4):395–415, August 1987.
- [KR94] Gregory Kucherov and Michaël Rusinowitch. On the ground reducibility problem for word rewriting systems with variables. *Information Processing Letters*, 1994. To appear. Earlier version appeared in the Proceedings of 1994 ACM/SIGAPP Symposium on Applied Computing, Phoenix, AZ.