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November 10, 2011

**Tutorials for “Automated Reasoning II”
Exercise sheet 3**

Exercise 3.1:

Use the Nelson–Oppen method to show that the following formula is unsatisfiable in the combination of EUF and linear integer arithmetic:

$$\exists x, y (x + y \approx 0 \wedge f(x) + f(-y) \approx 1)$$

(If you choose the equations to split cleverly, the proof is quite short.)

Exercise 3.2:

Is the theory of abelian groups stably infinite? Give an explanation.

Exercise 3.3:

Is the theory described by the following set of axioms stably infinite? Give an explanation.

$$\begin{aligned} \forall x (x * 0 \approx 0) \\ \forall x (x * 1 \approx x) \end{aligned}$$

Bring your solution (or solution attempt) to the tutorial on Nov. 28.