Prof. Bernd Finkbeiner, Ph.D.
Martin Zimmermann, Ph.D.
Leander Tentrup, B.Sc.

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Problem Set 17
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Verification

Problem 1: Cooper's Method [8 Points]

Apply quantifier-elimination to the following $\Sigma_{\mathbb{Z}}$-formulae.

a) $\forall y.\ 3 < x + 2y \vee 2x + y < 3$

b) $\exists y.\ 3 < x + 2y \vee 2x + y < 3$

The following exercises belong to the afternoon session.

Problem 2: Congruence Closure Algorithm [8 Points]

Apply the decision procedure for T_{E} to the following Σ_{E} formulae:

a) $f(f(f(a))) = f(a) \wedge f(f(a)) = a \wedge f(a) \neq a$

b) $f(f(f(a))) = f(f(a)) \wedge f(f(f(f(a)))) = a \wedge f(a) \neq a$

c) $f(g(x)) = g(f(x)) \wedge f(g(f(y))) = x \wedge f(y) = x \wedge g(f(x)) \neq x$

d) $p(x) \wedge f(f(x)) = x \wedge f(f(f(x))) = x \wedge \neg p(f(x))$