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Problem Set 18
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Verification

Problem 1: Decision Procedures [8 Points]

1. Apply the DAG-based decision procedure for T_{E} to the following Σ_{E}-formulae.
   a) $f(f(f(a))) = f(f(a)) \wedge f(f(f(f(a)))) = a \wedge f(a) \neq a$
   b) $f(g(x)) = g(f(x)) \wedge f(g(f(y))) = x \wedge f(y) = x \wedge g(f(x)) \neq x$
2. Apply the decision procedure for T_{cons} to the following T_{cons}-formulae:
   c) $\mathsf{car}(x) = y \wedge \mathsf{cdr}(x) = z \wedge x \neq \mathsf{cons}(y, z)$
   c) $\neg\mathsf{atom}(x) \wedge \mathsf{car}(x) = y \wedge \mathsf{cdr}(x) = z \wedge x \neq \mathsf{cons}(y, z)$