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1 Equational Unification

Definition 1.1 An ***E*-unification Problem** over Σ is a finite set S of the form $S = \left\{ s_1 \stackrel{?}{\approx}_E t_1, \dots, s_n \stackrel{?}{\approx}_E t_n \right\}$ with $s_1, \dots, s_n, t_1, \dots, t_n \in T(\Sigma, V)$, V being a countable set of Variables.

A substitution σ is an ***E*-unifier** of S iff $\sigma(s_i) \approx_E \sigma(t_i)$ for all $1 \leq i \leq n$. The set of all *E*-unifiers of S is denoted by $\mathcal{U}_E(S)$. S is ***E*-unifiable** iff $\mathcal{U}_E(S) \neq \emptyset$.

Definition 1.2 Let S be an *E*-unification problem over Σ .

- S is an ***elementary*** *E*-unification problem iff $\text{Sig}(E) = \Sigma$
- S is an *E*-unification problem ***with constants*** iff $\Sigma - \text{Sig}(E) \subseteq \Sigma^{(0)}$
- S is an ***general*** *E*-unification problem iff $\Sigma - \text{Sig}(E)$ contains an at least unary function symbol.