$\succ$ *Reduction Relation* iff $\succ$ well founded, stable, and monotonic.
$\succ$ *Reduction Order* iff $\succ$ well founded, stable, monotonic, and transitive.

Thm. 4.3.4
$\mathcal{R}$ terminates iff
there exists a reduction relation $\succ$ with $l \succ r$ for all $l \to r \in \mathcal{R}$.

Embedding Order: $s \succ_{emb} t$ iff

- $s = f(s_1, \ldots, s_n)$ and $s_i \succeq_{emb} t$ for some $i \in \{1, \ldots, n\}$ or
- $s = f(s_1, \ldots, s_n)$, $t = f(t_1, \ldots, t_n)$, $s_i \succ_{emb} t_i$ for some $i \in \{1, \ldots, n\}$, and $s_j \succeq_{emb} t_j$ for all $j \in \{1, \ldots, n\}$ with $j \neq i$.

$$\begin{array}{rcl} \mathsf{minus}(x, \mathcal{O}) & \to & x \\ \mathsf{minus}(\mathcal{O}, \mathsf{succ}(y)) & \to & \mathcal{O} \\ \mathsf{minus}(\mathsf{succ}(x), \mathsf{succ}(y)) & \to & \mathsf{minus}(x, y) \end{array} \qquad \begin{array}{rcl} \mathsf{minus}(x, \mathcal{O}) & \succ_{emb} & x \\ \mathsf{minus}(\mathcal{O}, \mathsf{succ}(y)) & \succ_{emb} & \mathcal{O} \\ \mathsf{minus}(\mathsf{succ}(x), \mathsf{succ}(y)) & \succ_{emb} & \mathsf{minus}(x, y) \end{array}$$