

Exercises.

3.0 Study Section 7.2 and Appendix B.

3.1 Is semantic labelling useful for proving termination of the TRS consisting of the following four rewrite rules?

$$\begin{array}{ll} f(a, b, x) \rightarrow f(x, x, x) & a \rightarrow c \\ f(x, y, z) \rightarrow c & b \rightarrow c \end{array}$$

3.2 Find a TRS that is provable terminating via semantic labelling and KBO but not with semantic labelling and MPO.

Hint: What kind of TRSs are not KBO-terminating?

3.3 Exercise 7.9.

Hint: First prove the lemma for $\triangleright_{\text{emb}}$.

3.4 Exercise 7.10.

3.5 Exercise 7.11.

3.6 A TRS \mathcal{R} is called *precedence terminating* if \exists well-founded precedence $>$ such that

$$\forall l \rightarrow r \in \mathcal{R} \forall f \in \text{FS}(r) \quad \text{root}(l) > f .$$

Show that precedence terminating TRSs are simply terminating.