

4. Exercise

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Exercise 4.1

1.

T_1 and T_2

$T_1 \subseteq T_2$?

Find mapping $h : T_2 \rightarrow T_1, x \mapsto \begin{cases} b_3 & x = b_1 \\ 5 & x = b_2 \\ b_4 & x = b_3 \\ b_3 & x = b_4 \\ a_1 & x = a_1 \\ a_2 & x = a_2 \end{cases} \Rightarrow T_1 \subseteq T_2$

$T_2 \subseteq T_1$?

Impossible since we would have to map the constant 5 to an other constant and T_2 does not contain a constant. So $T_2 \not\subseteq T_1$

Overall

$\Rightarrow T_1 \subset T_2$, but $T_2 \not\subseteq T_1$ and therefore $T_1 \neq T_2$

T_2 and T_3

$$T_2 \subseteq T_3?$$

$$T_3 \subseteq T_3?$$

Overall

T_1 and T_3

$$T_1 \subseteq T_3?$$

$$T_3 \subseteq T_3?$$

Analogously to $T_2 \subseteq T_1$ we would have to map the constant 5 to an other constant and T_3 does not contain a constant. So $T_3 \not\subseteq T_1$

Overall

$\Rightarrow T_1 \not\subseteq T_3, T_3 \not\subseteq T_1$ and therefore especially $T_1 \neq T_3$

2.