

Logic and Language: Exercise (Week 5)

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1

2 Pregroups

2.1

$$(4) \quad \begin{array}{ccc} & (\rightarrow) & (\leftarrow) \\ \frac{\frac{}{1^l \rightarrow 1^l 1} (1) \quad \frac{}{1^l 1 \rightarrow 1} (2)}{1^l \rightarrow 1} \rightarrow & & \frac{\frac{}{1 \rightarrow 1^l 1} (2) \quad \frac{}{1^l 1 \rightarrow 1^l} (1)}{1 \rightarrow 1^l} \rightarrow \end{array}$$

(5) (\rightarrow) :

$$\begin{array}{c} \frac{\frac{}{A^{rl} \rightarrow A^{rl} 1} (1) \quad \frac{}{1 \rightarrow A^r A} (2)}{A^{rl} \rightarrow A^{rl} (A^r A)} \rightarrow \\ \frac{\frac{}{A^{rl} \rightarrow (A^{rl} A^r) A} (1) \quad \frac{}{A^{rl} A^r \rightarrow 1} (2)}{A^{rl} \rightarrow 1 A} \rightarrow \frac{}{1 A \rightarrow A} (1) \rightarrow \\ A^{rl} \rightarrow A \end{array}$$

(\leftarrow) :

$$\begin{array}{c} \frac{\frac{}{A \rightarrow A 1} (1) \quad \frac{}{1 \rightarrow A^r A^{rl}} (2)}{A \rightarrow A (A^r A^{rl})} \rightarrow \\ \frac{\frac{}{A \rightarrow (A A^r) A^{rl}} (1) \quad \frac{}{A A^r \rightarrow 1} (3)}{A \rightarrow 1 A^{rl}} \rightarrow \frac{}{1 A^{rl} \rightarrow A^{rl}} (1) \rightarrow \\ A \rightarrow A^{rl} \end{array}$$

(6) (\rightarrow) :

$$\begin{array}{c}
\frac{\overline{(AB)^l \rightarrow (1(AB))^l} \rightarrow \overline{1 \rightarrow (B^l A^l)^r (B^l A^l)}}{\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l A^l))(AB))^l} \rightarrow} \quad (3) \\
\frac{\overline{(AB)^l \rightarrow ((B^l A^l)^r ((B^l A^l)(AB)))^l}}{\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l (A^l (AB))))} \quad (1) \\
\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l ((A^l A)B)))} \quad (1) \\
\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l (1B)))^l} \quad (1) \quad \overline{A^l A \rightarrow 1} \quad (2) \\
\frac{\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l B))^l} \quad \overline{1B \rightarrow B} \quad (1)}{\overline{(AB)^l \rightarrow ((B^l A^l)^r (B^l B))^l} \rightarrow \overline{B^l B \rightarrow 1} \quad (2)} \\
\frac{\overline{(AB)^l \rightarrow ((B^l A^l)^r 1)^l} \quad \overline{B^l B \rightarrow 1} \quad (2) \quad \text{todo} \quad \overline{(B^l A^l)^r 1 \rightarrow (B^l A^l)^r} \quad (2)}{\overline{(AB)^l \rightarrow ((B^l A^l)^r)^l} \quad (5)} \\
\frac{\overline{(AB)^l \rightarrow ((B^l A^l)^r)^l}}{\overline{(AB)^l \rightarrow B^l A^l}} \quad (5)
\end{array}$$