

$$\begin{array}{ccc} \mathbb{L}^{-}_{\triangle \mathbb{K}^{\mathbb{N}}} & \overset{\overline{\mathbb{T} \ast : \mathbb{X} \mathbb{L} \ast}}{\underset{\mathbb{L} \models}{\rightleftarrows}} & \mathbb{L}^{-}_{\triangle \mathbb{K}^{\mathbb{N}}} \\ \downarrow b & & \downarrow s \\ 2^n \mathbb{K} & \overset{q}{\underset{c}{\rightleftarrows}} & 2^n \mathbb{K} \end{array}$$

$$\mathbb{L}'\left(\overline{\mathbb{L} \models \mathbb{T}}\right) := \left(\overline{\mathbb{L} \ast \mathbb{L}}\right)\mathbb{T} \quad (\mathbb{T} \ast) \; \mathbb{1}' := \mathbb{T} \ast \; \mathbb{1}$$

$$\overline{\mathbb{L} \models \mathbb{L}'} = \overline{\mathbb{L} \ast \mathbb{L}} \models \stackrel{\text{univ}}{\Leftarrow} \overline{\mathbb{L} \models \mathbb{T} \ast \mathbb{L}'} = 0$$

$${}_M\overline{\overline{\mathbb{L} \models \mathbb{L}'}}\mathbb{T} = \overline{{}_M\mathbb{L} \ast \mathbb{L}}\overline{\mathbb{L} \models \mathbb{T}} = \overline{{}_M\mathbb{L} \ast \mathbb{L} \ast \mathbb{L}'}\mathbb{T} = \overline{{}_M\mathbb{L} \ast \overline{\mathbb{L} \ast \mathbb{L}'}}\mathbb{T} = {}_M\overline{\overline{\mathbb{L} \ast \mathbb{L}'}}\mathbb{T}$$

$$\overline{\mathbb{T} \ast \mathbb{L}'} = \overline{\mathbb{T} \ast \mathbb{1}'} \ast \stackrel{\text{univ}}{\Leftarrow} \overline{\mathbb{T} \ast \ast \mathbb{1}'} = 0$$

$$\mathbb{L}^p \models \ast \mathbb{T}^M = \sum_{P \subset M} \bigvee_{M \perp P}^P \overline{\mathbb{L} \ast \mathbb{T}^P} \ast \mathbb{T}^{M \perp P}$$

$$\mathbb{T} \ast \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} = \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} \stackrel{m-1}{=} \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} \models \mathbb{T}^N \colon \quad \mathbb{1} \ast \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} = \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} \stackrel{k(m+1)}{=} \overline{\overline{\mathbb{L} \models \mathbb{T}^N}} \models \mathbb{T}^N$$

$$\mathbb{T}^m \times \underbrace{\mathbb{L}^m \models \mathbb{T}^N}_{=0} = \underbrace{\mathbb{L}}_{=0} \mathbb{T}^N$$

$$m = 1: \mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=0} = \underbrace{\mathbb{L}}_{=0} \mathbb{T}^N \Leftarrow \text{RHS} = \text{LHS} + \underbrace{\mathbb{L} \models \mathbb{T} \times \mathbb{T}^N}_{=0}$$

$$\begin{aligned} 1 \leq m \curvearrowright m+1: \overset{m-1}{-1} \underbrace{[\mathbb{T} \times \underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Der}}]} \models \mathbb{T}^N &= \overset{m-1}{-1} \mathbb{L} \models \overbrace{[\underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Der}}] \models \mathbb{T}^N}^{\text{Ind}} = \underbrace{\mathbb{L} \models \mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=0}}_{\text{Der}} \\ &= \underbrace{\mathbb{L}}_{=0} \mathbb{T} \models \mathbb{T}^N - \mathbb{T} \times \underbrace{[\mathbb{L} \models \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=0}]}_{=0} \end{aligned}$$

$$\Rightarrow \overset{m}{-1} \underbrace{[\underbrace{\mathbb{L} \times \underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Der}}]} \models \mathbb{T}^N}_{=0} = \overset{m}{-1} \left(\underbrace{[\mathbb{T} \times \underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Der}}]} \models \mathbb{T}^N + \overset{m}{-1} \underbrace{\mathbb{L}}_{=0} \mathbb{T} \models \mathbb{T}^N \right) = \mathbb{T} \times \underbrace{[\underbrace{\mathbb{L} \times \mathbb{L}}_{=0} \models \mathbb{T}^N]}_{=0}$$

$$\text{Ind } 0 \leq k: \underbrace{[\mathbb{T} \times \mathbb{T}]}_{=0} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=0} = \mathbb{T} \times \underbrace{[\mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=0}]}_{=0} = \overset{m-1}{-1} \mathbb{T} \times \underbrace{[\underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Ind}} \models \mathbb{T}^N]}_{=0}$$

$$\begin{aligned} &= \overset{m-1}{-1} \overset{km}{-1} \underbrace{[\underbrace{\mathbb{L} \dashv \mathbb{T}}_{\text{Ind}} \dashv \mathbb{T}]} \models \mathbb{T}^N = \overset{m-1}{-1} \overset{km}{-1} \underbrace{[\mathbb{L} \dashv \underbrace{\mathbb{T} \times \mathbb{T}}_{=0}]} \models \mathbb{T}^N = \underbrace{\overset{m-1}{-1} \overset{km}{-1} \overset{k}{-1}}_{\substack{(k+1)(m+1) \\ = -1}} \underbrace{[\mathbb{L} \dashv \underbrace{\mathbb{T} \times \mathbb{T}}_{=0}]} \models \mathbb{T}^N \end{aligned}$$

$$\mathbb{T}^m \times \underbrace{\mathbb{L}^m \models \mathbb{T}^N}_{=0} = \underbrace{\mathbb{L}}_{=0} \mathbb{T}^N$$

$$\overline{{}_N\mathbb{L}\dashv\!\!\!\lrcorner\!\!\!\rceil^m\mathbb{T}\models\mathbb{T}^N}=\mathbb{U}\mathbb{J}\overline{{}_N\mathbb{L}\mathbb{T}^N}$$

$$\overline{\mathbb{L}^{\overline{m-1}}\rtimes\mathbb{L}^{\overline{m}}\mathbb{T}^N}-\mathbb{T}\rtimes\overline{\mathbb{L}\rtimes\mathbb{L}\models\mathbb{T}^N}=\overline{\mathbb{L}\mathbb{L}\models\mathbb{T}}\operatorname{Ind}\mathbb{T}^N+\overline{-1\mathbb{T}\rtimes\mathbb{L}\rtimes\mathbb{L}\models\mathbb{T}^N}$$

$$=\overline{\mathbb{L}\models\mathbb{T}}\rtimes\overline{\mathbb{L}\models\mathbb{T}^N}+\overline{-1\mathbb{T}\rtimes\mathbb{L}\models\mathbb{L}\models\mathbb{T}^N}=\mathbb{L}\models\operatorname{Der}\overline{\mathbb{T}\rtimes\mathbb{T}\models\mathbb{T}^N}_{n+1-m}=0$$

$$\overline{{}_N\mathbb{L}\dashv\!\!\!\lrcorner\!\!\!\rceil\mathbb{L}\models\mathbb{T}^N}=\overline{{}_N\mathbb{T}\rtimes\mathbb{L}\models\mathbb{T}^N}}=\overline{{}_N\mathbb{T}\mathbb{L}\mathbb{T}^N}}=\overline{{}_N\mathbb{L}\mathbb{T}^N}\mathbb{U}\mathbb{J}$$

$$\begin{array}{ccc} \mathbb{L}_{\bigtriangleup\mathbb{K}}^{-\mathbb{N}} & \overset{\mathbb{T}\rtimes:\overline{\mathbb{X}\mathbb{L}\rtimes}}{\underset{\mathbb{L}\models}{\rightleftarrows}} & \mathbb{L}_{\bigtriangleup\mathbb{K}}^{-\mathbb{N}} \\ \downarrow b & & \downarrow s \\ 2^n\mathbb{K} & \overset{q}{\underset{c}{\rightleftarrows}} & 2^n\mathbb{K} \end{array}$$

$$\mathbb{L}\overline{\mathbb{L}\models\mathbb{T}}:=\overline{\mathbb{L}\rtimes\mathbb{L}\mathbb{T}};\quad(\mathbb{T}\rtimes)\mathbb{1}:=\mathbb{T}\rtimes\mathbb{1}$$

$$\overline{\mathbb{L}\models\mathbb{L}\models}=\overline{\mathbb{L}\rtimes\mathbb{L}}\models\stackrel{\text{univ}}{\Leftarrow}\overline{\mathbb{L}\models\rtimes\mathbb{L}\models}=0$$

$${}_M\mathbb{L}\overline{\overline{\mathbb{L}\models\mathbb{L}'\models\mathbb{T}}}=\overline{{}_M\mathbb{L}\rtimes\mathbb{L}\mathbb{L}'\models\mathbb{T}}=\overline{{}_M\mathbb{L}\rtimes\mathbb{L}\rtimes\mathbb{L}'\mathbb{T}}=\overline{{}_M\mathbb{L}\rtimes\mathbb{L}\rtimes\mathbb{L}}\mathbb{T}={}_M\mathbb{L}\overline{\overline{\mathbb{L}\rtimes\mathbb{L}'\models\mathbb{T}}}$$

$$\overline{\mathbb{T}\rtimes\mathbb{L}'\rtimes}=\overline{\mathbb{T}\rtimes\mathbb{1}\rtimes}\stackrel{\text{univ}}{\Leftarrow}\overline{\mathbb{T}\rtimes\rtimes\mathbb{1}\rtimes}=0$$

$$\overline{\mathbb{L}\models\rtimes\mathbb{T}^M}=\sum_{P\subset M}{}_M\mathbb{L}_P^P\overline{\overline{\mathbb{L}\rtimes\mathbb{T}^P}}\rtimes\mathbb{T}^{M-P}$$

$$\mathbb{T}\rtimes\overline{\mathbb{T}\models\mathbb{T}^N}=\overline{-1\mathbb{L}\dashv\!\!\!\lrcorner\!\!\!\rceil}\models\mathbb{T}^N:\quad\mathbb{1}\rtimes\overline{\mathbb{T}\models\mathbb{T}^N}=\overline{-1^{(m+1)}\mathbb{L}\models\mathbb{T}}\models\mathbb{T}^N$$

$$\mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=} = \mathbb{L} \mathbb{J} \mathbb{T}^N$$

$$m=1:\mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=} = \mathbb{L} \mathbb{J} \mathbb{T}^N \Leftarrow \text{RHS} = \text{LHS} + \underbrace{\mathbb{L} \models \mathbb{T} \times \mathbb{T}^N}_{=0}$$

$$1 \leqslant m \curvearrowright m+1: \overline{-1^{-1} \left[\mathbb{T} \times \mathbb{L} \dashv \right] \models \mathbb{T}^N} = \overline{-1^{-1} \mathbb{L} \models \left[\mathbb{L} \dashv \right] \models \mathbb{T}^N} \text{ Ind} = \underbrace{\mathbb{L} \models \mathbb{T} \times \mathbb{L} \models \mathbb{T}^N}_{\text{Der}} = \mathbb{L} \mathbb{J} \mathbb{L} \models \mathbb{T}^N - \mathbb{T} \times \mathbb{L} \models \mathbb{L} \models \mathbb{T}^N$$

$$\Rightarrow \overline{-1^m \left[\mathbb{L} \times \mathbb{L} \dashv \right]_{\text{Der}} \models \mathbb{T}^N} = \overline{-1^m \left(\left[\mathbb{T} \times \mathbb{L} \dashv \right] \models \mathbb{T}^N + \overline{-1^m \mathbb{L} \mathbb{J} \mathbb{L} \models \mathbb{T}^N} \right)} = \mathbb{T} \times \overline{\mathbb{L} \times \mathbb{L} \models \mathbb{T}^N}$$

$$\text{Ind } 0 \leqslant k: \overline{\mathbb{T} \times \mathbb{J} \times \mathbb{L} \models \mathbb{T}^N} = \mathbb{T} \times \overline{\mathbb{T} \times \mathbb{L} \models \mathbb{T}^N} = \overline{-1^{m-1} \mathbb{T} \times \underbrace{\left[\mathbb{L} \dashv \right] \models \mathbb{T}^N}_{\text{Ind}}}$$

$$= \overline{-1^{m-1} \overline{-1^{km} \left[\mathbb{L} \dashv \right] \dashv \mathbb{T} \models \mathbb{T}^N}} = \overline{-1^{m-1} \overline{+ km \left[\mathbb{L} \dashv \right] \times \mathbb{J} \models \mathbb{T}^N}} = \underbrace{\overline{-1^{m-1} \overline{+ km} \overline{-1^k \left[\mathbb{L} \dashv \right] \times \mathbb{J} \models \mathbb{T}^N}}}_{=\overline{(k+1) \overline{-1^{(m+1)}}}}$$

$$\mathbb{T} \times \underbrace{\mathbb{L} \models \mathbb{T}^N}_{=} = \mathbb{L} \mathbb{J} \mathbb{T}^N$$

$$\overline{{}_N \mathbb{L} \dashv \mathbb{T} \left[\mathbb{L} \models \mathbb{T}^N \right]} = \mathbb{L} \mathbb{J} \underbrace{{}_N \mathbb{L} \mathbb{T}^N}_{=}$$

$$\overline{\overline{-1^{m-1} \times \mathbb{L}^m} \mathbb{T}^N} - \mathbb{T} \times \overline{\mathbb{L} \times \mathbb{L} \models \mathbb{T}^N} = \overline{\overline{\text{Ind}} \left[\mathbb{L} \models \mathbb{T} \right] \mathbb{T}^N} + \overline{-1^m \mathbb{T} \times \overline{\mathbb{L} \times \mathbb{L} \models \mathbb{T}^N}}$$

$$= \overline{\mathbb{L} \models \mathbb{J} \times \mathbb{L} \models \mathbb{T}^N} + \overline{-1^m \mathbb{T} \times \overline{\mathbb{L} \models \mathbb{L} \models \mathbb{T}^N}} = \underbrace{\mathbb{L} \models \overline{\mathbb{T} \times \mathbb{T} \models \mathbb{T}^N}}_{n+1-m} = 0$$

$$\overline{{}_N \mathbb{L} \dashv \mathbb{T} \left[\mathbb{L} \models \mathbb{T}^N \right]} = \overline{{}_N \mathbb{L} \overline{\mathbb{T} \times \mathbb{L} \models \mathbb{T}^N}} = \overline{{}_N \mathbb{L} \overline{\mathbb{T} \mathbb{L}^N}} = \underbrace{{}_N \mathbb{L} \mathbb{T}^N}_{=}\mathbb{L}$$

$$\begin{array}{ccc} \mathbb{L}_{\bigtriangleup \mathbb{K}}^{-\mathbb{N}} & \overset{\mathbb{T} \times : (\mathbb{T} \mathbb{L}) \times}{\underset{\mathbb{L} \models}{\rightleftarrows}} & \mathbb{L}_{\bigtriangleup \mathbb{K}}^{-\mathbb{N}} \\ \downarrow b & & \downarrow s \\ 2^n \mathbb{K} & \overset{q}{\underset{c}{\rightleftarrows}} & 2^n \mathbb{K} \end{array}$$

$$\begin{aligned}
\mathbb{L}(\mathbb{L} \models) &= \mathbb{L}(\mathbb{X} \mathbb{L}): & {}_M \mathbb{L}(\mathbb{L} \models) &= \left[\begin{smallmatrix} \mathbb{L} \\ {}_M \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \\
\mathbb{L} \models * \mathbb{L} \models &= 0 = \mathbb{L} \models^2 \\
\mathbb{L} \models \underbrace{\mathbb{L} \triangle}_{\mathbb{L} \triangle} \mathbb{T} &= \mathbb{T} \underbrace{\mathbb{L} \mathbb{L} \models \mathbb{T}} \\
{}_M \mathbb{L}(\mathbb{T} \mathbb{X} \mathbb{T}) &= {}_M \mathbb{L}(\mathbb{T} \mathbb{X} \mathbb{T}) = \sum_i^M \mathbb{Y}_{M \mathbb{L} i}^i \underbrace{\mathbb{L} \mathbb{T}}_{\mathbb{M} \mathbb{L} i} \underbrace{\mathbb{L} \mathbb{T}}_{\mathbb{M} \mathbb{L} i} \\
{}_M \mathbb{L}(\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{T}) &= \sum_i^M \mathbb{Y}_{M \mathbb{L} i}^i \underbrace{\mathbb{L} \mathbb{X} \mathbb{L}}_{\mathbb{M} \mathbb{L} i} \underbrace{\mathbb{L} \mathbb{T}}_{\mathbb{M} \mathbb{L} i} \\
\mathbb{T} \mathbb{X} * \mathbb{T} \mathbb{X} &= 0 = \mathbb{T} \mathbb{X}^2 = \underbrace{\mathbb{L} \mathbb{X} \mathbb{X}}^2 \\
\mathbb{L} \models \underbrace{\mathbb{T} \mathbb{X} \mathbb{T}} &= \mathbb{L} \models \mathbb{T} \mathbb{X} \mathbb{T} + \varepsilon^P \mathbb{T} \mathbb{X} \mathbb{L} \models \mathbb{T} \\
{}_M \mathbb{L} \text{ LHS} &= \left[\begin{smallmatrix} \mathbb{L} \\ {}_M \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \mathbb{X} \mathbb{T} = \sum_{P \subset M} \mathbb{O}_{|M \mathbb{L} P}^P \left(\left[\begin{smallmatrix} \mathbb{L} \\ P \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \right) \times \mathbb{M} \mathbb{L} P \mathbb{T} + \mathbb{O}_{|M \mathbb{L} P}^P \underbrace{\mathbb{L} \mathbb{T}}_{P \mathbb{L}} \times \left[\begin{smallmatrix} \mathbb{L} \\ {}_M \mathbb{L} P \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \\
&= \sum_{P \subset M} \mathbb{Y}_{M \mathbb{L} P}^P \underbrace{\mathbb{L} \mathbb{L} \models \mathbb{T}}_{P \mathbb{L}} \times \mathbb{M} \mathbb{L} P \mathbb{T} + \mathbb{Y}_{M \mathbb{L} P}^P \underbrace{\mathbb{L} \mathbb{T}}_{P \mathbb{L}} \times \underbrace{\mathbb{M} \mathbb{L} P \mathbb{L} \models \mathbb{T}}_{P \mathbb{L}} = {}_M \mathbb{L} \text{ RHS} \\
\mathbb{L} \models \mathbb{X} \mathbb{T}^M &= \sum_i^M \mathbb{Y}_{M \mathbb{L} i}^i \underbrace{\mathbb{L} \mathbb{T}^i}_{\mathbb{M} \mathbb{L} i} \mathbb{X} \mathbb{T}^{M-i} \\
\mathbb{L} \models \mathbb{T} \mathbb{X} \mathbb{T} &= \mathbb{T} \mathbb{X} \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{T}} \\
\mathbb{L} \models^* &= \mathbb{X} \mathbb{L} \mathbb{X}: & \mathbb{T} \mathbb{X}^* &= \mathbb{T} \mathbb{X} \mathbb{L} \mathbb{L} \\
\mathbb{T}^N \mathbb{X} \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{T}^M}_{\mathbb{L} \mathbb{L} \mathbb{L}} &= \text{per } \mathbb{T}^N \mathbb{X} \left[\mathbb{X} \mathbb{L} \mathbb{T}^M \right] = \sum_j^N \mathbb{Y}_{N \mathbb{L} j}^j \underbrace{\mathbb{T}^j \mathbb{X} \mathbb{X} \mathbb{L}}_{N \mathbb{L} j} \underbrace{\mathbb{T}^{N-j} \mathbb{X} \mathbb{T}^M}_{N \mathbb{L} j} = \\
\sum_j^N \mathbb{Y}_{N \mathbb{L} j}^j \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{T}^j}_{N \mathbb{L} j} \mathbb{T}^{N-j} \mathbb{X} \mathbb{T}^M &= \sum_j^N \mathbb{Y}_{N \mathbb{L} j}^j \underbrace{\mathbb{L} \mathbb{T}^j \mathbb{T}^{N-j}}_{N \mathbb{L} j} \mathbb{X} \mathbb{T}^M = \mathbb{L} \mathbb{L} \mathbb{T}^N \mathbb{X} \mathbb{T}^M \\
\mathbb{L} \mathbb{L} * \mathbb{T} \mathbb{X} &= \mathbb{L} \mathbb{L} \mathbb{L} \mathbb{L} \mathbb{L} + \mathbb{T} \mathbb{X} \mathbb{L} \mathbb{L} \\
\mathbb{L} \mathbb{L} \underbrace{\mathbb{X} \mathbb{L} \mathbb{X}} + \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{L} \mathbb{L}} &= \mathbb{L} \mathbb{X} \mathbb{L} \mathbb{L} \\
\mathbb{L} \mathbb{L} \mathbb{T} \mathbb{X} &= \mathbb{L} \mathbb{L} \mathbb{T} \mathbb{T} + \varepsilon \mathbb{T} \mathbb{X} \mathbb{L} \mathbb{L} \\
{}_M \mathbb{L}(\text{LHS } \mathbb{T}) &= \left[\begin{smallmatrix} \mathbb{L} \\ {}_M \mathbb{L} \end{smallmatrix} \right] \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{T}} + {}_M \mathbb{L} \underbrace{\mathbb{X} \mathbb{L} \mathbb{X} \mathbb{L} \mathbb{L} \mathbb{L}} = \mathbb{L} \mathbb{X} \mathbb{L} \mathbb{L} \mathbb{L}
\end{aligned}$$

$$-\sum_i^M \underbrace{\dot{\bigvee}_{M\perp i}^i \mathbb{L} \times \mathbb{L}'}_{\left[\begin{smallmatrix} \mathbb{L} \\ M\perp i \end{smallmatrix} \right] \mathbb{T}} + \sum_i^M \underbrace{\dot{\bigvee}_{M\perp i}^i \mathbb{L} \times \mathbb{L}'}_{\left[\begin{smallmatrix} \mathbb{L} \\ M\perp i \end{smallmatrix} \right] \mathbb{T}} \underbrace{\mathbb{L} \mathbb{L} \models \mathbb{T}}$$

$$\times \overline{\mathbb{T} \times} \models \mathbb{T} = \overline{\mathbb{T} \times} \models \mathbb{T} \text{ als form}$$

$$\overline{\mathbb{T} \times} \times \overline{\mathbb{T} \rightarrow} \models \mathbb{T} = \overline{\mathbb{T} \times} \models \mathbb{T} \times \overline{\mathbb{T} \times} = \overline{\mathbb{T} \times \mathbb{T} \models \mathbb{T}}^* = \overline{\mathbb{T} \times \mathbb{T} \mathbb{T}}^* = \mathbb{T} \times \overline{\mathbb{T} \mathbb{T}} = \overline{\mathbb{T} \mathbb{T}} \times \mathbb{T} = \overline{\mathbb{T} \times} \times \overline{\mathbb{T} \times} \models \mathbb{T}$$

$$\begin{array}{ccc} \mathbb{L} \begin{smallmatrix} - \\ \triangle \\ \mathbb{K} \end{smallmatrix} \overset{\mathbb{T} \times : (\times \mathbb{L}) \times}{\underset{\mathbb{L} \models}{\rightleftarrows}} \mathbb{L} \begin{smallmatrix} - \\ \triangle \\ \mathbb{K} \end{smallmatrix} \\ \downarrow b \qquad \qquad \qquad \downarrow s \\ 2^n \mathbb{K} \overset{q}{\underset{c}{\rightleftarrows}} 2^n \mathbb{K} \end{array}$$

$$\mathbb{L} \overline{\mathbb{L} \models \mathbb{T}} = \overline{\mathbb{L} \times \mathbb{L}} \mathbb{T} \colon \quad {}_M \mathbb{L} \overline{\mathbb{L} \models \mathbb{T}} = \left[\begin{smallmatrix} \mathbb{L} \\ M \mathbb{L} \end{smallmatrix} \right] \mathbb{T}$$

$$\mathbb{L} \models \ast \mathbb{L} \models = 0 = \mathbb{L} \models^2$$

$$\mathbb{L} \models \overline{\mathbb{L} \triangle} \mathbb{T} = \mathbb{T} \overline{\mathbb{L} \mathbb{T} \models \mathbb{T}}$$

$${}_M \mathbb{L} \overline{\mathbb{T} \times} \mathbb{T} = {}_M \mathbb{L} \overline{\mathbb{T} \times} \mathbb{T} = \sum_i^M \underbrace{\dot{\bigvee}_{M\perp i}^i \mathbb{L} \mathbb{T}}_{\left[\begin{smallmatrix} \mathbb{L} \\ M\perp i \end{smallmatrix} \right] \mathbb{T}}$$

$${}_M \mathbb{L} \overline{\mathbb{T} \times \mathbb{T}} = \sum_i^M \underbrace{\dot{\bigvee}_{M\perp i}^i \mathbb{L} \times \mathbb{L}}_{\left[\begin{smallmatrix} \mathbb{L} \\ M\perp i \end{smallmatrix} \right] \mathbb{T}} \mathbb{T}$$

$$\overline{\mathbb{T} \times} \ast \overline{\mathbb{T} \times} = 0 = \overline{\mathbb{T} \times}^2 = \overline{\mathbb{L} \times \times}^2$$

$$\mathbb{L} \models \overline{\mathbb{T} \times} \mathbb{T} = \overline{\mathbb{L} \models \mathbb{T} \times} \mathbb{T} + \varepsilon^p \overline{\mathbb{T} \times} \mathbb{L} \models \mathbb{T}$$

$${}_M \mathbb{L} \text{ LHS} = \left[\begin{smallmatrix} \mathbb{L} \\ M \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \times \mathbb{T} = \sum_{P \subset M} \bullet_{O|M\perp P}^P \left(\left[\begin{smallmatrix} \mathbb{L} \\ P \mathbb{L} \end{smallmatrix} \right] \mathbb{T} \right) \times {}_{M\perp P} \mathbb{T} + \bullet_{|M\perp P}^{O|P} \overline{\mathbb{L} \mathbb{T}} \times \left[\begin{smallmatrix} \mathbb{L} \\ M\perp P \mathbb{L} \end{smallmatrix} \right] \mathbb{T}$$

$$= \sum_{P \subset M} \overline{\mathbb{L} \mathbb{T}}^P \times \overline{{}_P \mathbb{L} \mathbb{T}} + \overline{\mathbb{L} \mathbb{T}}^P \times \overline{{}_P \mathbb{L} \mathbb{T}}^P \times \overline{{}_M \mathbb{L} \mathbb{T}} = {}_M \mathbb{L} \text{ RHS}$$

$$\mathbb{L} \models \overline{\mathbb{T}^M} = \sum_i^M \underbrace{\dot{\bigvee}_{M\perp i}^i \mathbb{L} \mathbb{T}}_{\left[\begin{smallmatrix} \mathbb{L} \\ M\perp i \end{smallmatrix} \right] \mathbb{T}} \overline{\mathbb{T}^{M-i}}$$

$$\mathbb{L} \models \mathbb{J} \star \acute{\mathbb{I}} = \mathbb{I} \star \overline{\mathbb{X} \mathbb{L} \mathbb{X} \acute{\mathbb{I}}}$$

$$\overline{\mathbb{I} \models}^* = \mathbb{X} \mathbb{L} \mathbb{X} \colon \quad \overline{\mathbb{I} \mathbb{X}}^* = \mathbb{J} \mathbb{X} \models$$

$$\mathbb{I}^N \star \overline{\mathbb{X} \mathbb{L} \mathbb{X} \acute{\mathbb{I}}^M} = \det \mathbb{I}^N \star \left[\mathbb{X} \mathbb{L} \quad \acute{\mathbb{I}}^M \right] = \sum_j^N \mathop{\mathbb{V}}\limits_{N \mathbb{L} j}^j \overline{\mathbb{I}^j \star \mathbb{X} \mathbb{L} \mathbb{I}^{N \mathbb{L} j} \star \acute{\mathbb{I}}^M} =$$

$$\sum_j^N \mathop{\mathbb{V}}\limits_{N \mathbb{L} j}^j \overline{\mathbb{X} \mathbb{L} \star \mathbb{I}^j \mathbb{I}^{N \mathbb{L} j}} \star \acute{\mathbb{I}}^M = \sum_j^N \mathop{\mathbb{V}}\limits_{N \mathbb{L} j}^j \overline{\mathbb{L} \mathbb{I}^j \mathbb{I}^{N \mathbb{L} j}} \star \acute{\mathbb{I}}^M = \overline{\mathbb{L} \models \mathbb{I}^N} \star \acute{\mathbb{I}}^M$$

$$\mathbb{L} \models \mathbb{J} \mathbb{X} = \mathbb{J} \mathbb{J} \mathbb{L} \models \mathbb{J} \mathbb{X} + \mathbb{J} \mathbb{X} \mathbb{L} \models$$

$$\mathbb{L} \models \overline{\mathbb{X} \acute{\mathbb{L}} \mathbb{X}} + \overline{\mathbb{X} \acute{\mathbb{L}} \mathbb{X} \mathbb{L} \models} = \mathbb{L} \star \acute{\mathbb{L}} \mathbb{1}$$

$$\mathbb{L} \models \overline{\mathbb{J} \mathbb{X} \mathbb{J}} = \overline{\mathbb{L} \models \mathbb{J} \mathbb{I}} + \varepsilon \mathbb{J} \mathbb{X} \mathbb{L} \models \mathbb{J}$$

$${}_M\mathbb{L} \, (\, \text{LHS} \, \mathbb{I}) = \left[\begin{array}{c} \mathbb{L} \\ {}_M\mathbb{L} \end{array} \right] \overline{\mathbb{X} \acute{\mathbb{L}} \mathbb{X} \mathbb{I}} + {}_M\mathbb{L} \, \overline{\mathbb{X} \acute{\mathbb{L}} \mathbb{X} \mathbb{L} \models \mathbb{J}} = \overline{\mathbb{L} \star \acute{\mathbb{L}} \, {}_M\mathbb{L} \mathbb{I}}$$

$$-\sum_i^M \mathop{\mathbb{V}}\limits_{M \mathbb{L} i}^i \underbrace{\mathbb{L} \star \acute{\mathbb{L}}}_{{}_M\mathbb{L} i} \left[\begin{array}{c} \mathbb{L} \\ {}_M\mathbb{L} \end{array} \mathbb{I} \right] + \sum_i^M \mathop{\mathbb{V}}\limits_{M \mathbb{L} i}^i \underbrace{\mathbb{L} \star \acute{\mathbb{L}}}_{{}_M\mathbb{L} i} \underbrace{{}_M\mathbb{L} \mathbb{L} \models \mathbb{J}}$$

$$\star \overline{\mathbb{J} \mathbb{X}} \models \mathbb{I} = \mathbb{J} \mathbb{X} \models \mathbb{I} \text{ als form}$$

$$\overline{\acute{\mathbb{I}} \star \star \mathbb{I} \rightarrow \models \mathbb{I}} = \overline{\mathbb{J} \mathbb{X} \models \mathbb{I} \star \star \acute{\mathbb{I}} \mathbb{X}} = \overline{\mathbb{J} \mathbb{X} \models \mathbb{L} \mathbb{I}}^* = \overline{\mathbb{J} \mathbb{X} \mathbb{J} \mathbb{X} \acute{\mathbb{I}}}^* = \mathbb{I} \star \star \mathbb{J} \mathbb{X} \acute{\mathbb{I}} = \mathbb{J} \mathbb{X} \acute{\mathbb{I}} \star \mathbb{I} = \acute{\mathbb{I}} \star \star \overline{\mathbb{J} \mathbb{X} \models \mathbb{I}}$$