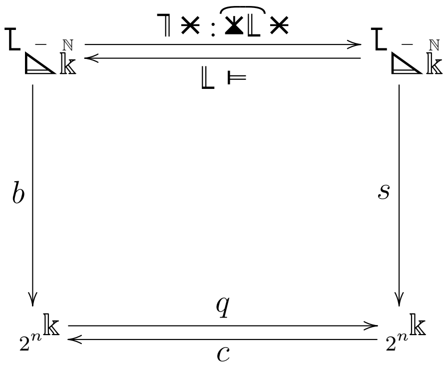


$$\acute{\mathbb{L}}\,\overbrace{\mathbb{L}\vDash\mathbb{T}}:=\underbrace{\acute{\mathbb{L}}\times\mathbb{L}}\mathbb{T}:\quad(\mathbb{T}\times)\,\acute{\mathbb{T}}:=\mathbb{T}\times\acute{\mathbb{T}}$$

$$\overbrace{\mathbb{L}\vDash}\overbrace{\acute{\mathbb{L}}\vDash}=\overbrace{\mathbb{L}\times\acute{\mathbb{L}}}\vDash\underset{\text{univ}}{\Longleftarrow}\ \overbrace{\mathsf{L}\vDash}\times\overbrace{\acute{\mathsf{L}}\vDash}=0$$

$$_M\mathsf{L}\underbrace{\overbrace{\mathbb{L}\vDash}\overbrace{\acute{\mathbb{L}}\vDash}}\mathbb{T}=\overbrace{_M\mathsf{L}\times\mathbb{L}}\overbrace{\acute{\mathbb{L}}\vDash\mathbb{T}}=\underbrace{\overbrace{_M\mathsf{L}\times\mathbb{L}}\times\acute{\mathbb{L}}}\mathbb{T}=\underbrace{_M\mathsf{L}\times\overbrace{\mathbb{L}\times\acute{\mathbb{L}}}}\mathbb{T}=\ _M\mathsf{L}\underbrace{\overbrace{\mathbb{L}\times\acute{\mathbb{L}}}\vDash\mathbb{T}}$$

$$\overbrace{\mathbb{T}\times}\overbrace{\acute{\mathbb{L}}\times}=\overbrace{\mathbb{T}\times\acute{\mathbb{T}}}\times\underset{\text{univ}}{\Longleftarrow}\ \overbrace{\mathsf{T}\times}\times\overbrace{\acute{\mathsf{T}}\times}=0$$

$$\overset{p}{\mathbb{L}}\vDash\underbrace{\times\mathsf{T}^{M}}=\sum_{P\,\subset\,M}\overset{P}{\underset{M\llcorner P}{\vee}}\underbrace{\mathbb{L}\overbrace{\times\mathsf{T}}^{P}}\underbrace{\times\mathsf{T}^{M\llcorner P}}$$

$$\mathsf{T}\times\underbrace{\overset{m}{\mathbb{L}}\vDash\mathbb{T}^{N}}=\overset{m-1}{-1}\underbrace{\mathbb{L}\dashv\mathsf{T}}\vDash\mathbb{T}^{N}:\quad\overset{k}{\mathbb{T}}\times\underbrace{\overset{m}{\mathbb{L}}\vDash\mathbb{T}^{N}}=\overset{k\,(m+1)}{-1}\underbrace{\mathbb{L}\vDash\mathbb{T}}\vDash\mathbb{T}^{N}$$

$$\overset{m}{\urcorner\!\!\urcorner} \times \underbrace{\overset{m}{\mathbb{L}} \vDash \mathbb{T}^N} = \underbrace{\mathbb{L}\urcorner\!\!\urcorner}\,\mathbb{T}^N$$

$$m=1: \urcorner \times \underbrace{\llcorner \vDash \mathbb{T}^N} = \underbrace{\llcorner\urcorner}\,\mathbb{T}^N \Leftarrow \text{RHS} = \text{LHS} + \llcorner \vDash \underbrace{\urcorner\times\mathbb{T}^N}_{=0}$$

$$1\leqslant m \curvearrowright m+1: \overset{m-1}{-1}\overbrace{\llcorner\times\underbrace{\mathbb{L}\dashv\urcorner}}\vDash\mathbb{T}^N = \overset{m-1}{-1}\llcorner\vDash\overbrace{\underbrace{\mathbb{L}\dashv\urcorner}\vDash\mathbb{T}^N}^{\text{Ind}} = \underset{\text{Der}}{\llcorner\vDash}\overbrace{\urcorner\times\underbrace{\mathbb{L}\vDash\mathbb{T}^N}}$$

$$= \underbrace{\llcorner\urcorner}\underbrace{\mathbb{L}\vDash\mathbb{T}^N} - \urcorner\times\overbrace{\llcorner\vDash\underbrace{\mathbb{L}\vDash\mathbb{T}^N}}$$

$$\Longrightarrow \overset{m}{-1}\overbrace{\underbrace{\llcorner\times\mathbb{L}}_{\text{Der}}\dashv\urcorner}\vDash\mathbb{T}^N = \overset{m}{-1}\left(\overbrace{\llcorner\times\underbrace{\mathbb{L}\dashv\urcorner}}\vDash\mathbb{T}^N + \overset{m}{-1}\underbrace{\llcorner\urcorner}\underbrace{\mathbb{L}\vDash\mathbb{T}^N}\right) = \urcorner\times\overbrace{\underbrace{\llcorner\times\mathbb{L}}\vDash\mathbb{T}^N}$$

$$\text{Ind } 0\leqslant k: \underbrace{\overset{k}{\urcorner\!\!\urcorner}\times\urcorner}\times\underbrace{\mathbb{L}\vDash\mathbb{T}^N} = \urcorner\!\!\urcorner\times\overbrace{\urcorner\times\underbrace{\mathbb{L}\vDash\mathbb{T}^N}} = \overset{m-1}{-1}\urcorner\!\!\urcorner\times\underbrace{\overbrace{\mathbb{L}\dashv\urcorner}^{m-1}\vDash\mathbb{T}^N}_{\text{Ind}}$$

$$= \overset{m-1}{-1}\,\overset{km}{-1}\overbrace{\underbrace{\mathbb{L}\dashv\urcorner}\dashv\urcorner\!\!\urcorner}\vDash\mathbb{T}^N = \overset{m-1+km}{-1}\overbrace{\mathbb{L}\dashv\underbrace{\urcorner\times\urcorner\!\!\urcorner}}\vDash\mathbb{T}^N = \underbrace{\overset{m-1+km}{-1}\,\overset{k}{-1}}_{=\overset{(k+1)(m+1)}{-1}}\overbrace{\mathbb{L}\dashv\underbrace{\urcorner\times\urcorner\!\!\urcorner}}\vDash\mathbb{T}^N$$

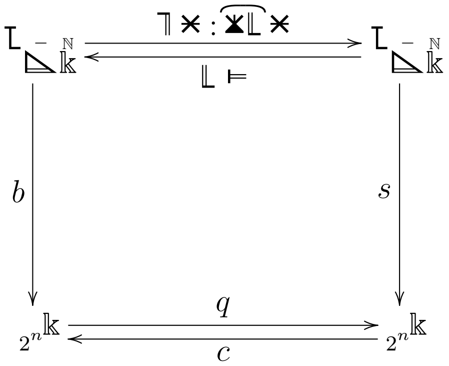
$$\overset{m}{\urcorner\!\!\urcorner} \times \underbrace{\overset{m}{\mathbb{L}} \vDash \mathbb{T}^N} = \underbrace{\mathbb{L}\urcorner\!\!\urcorner}\,\mathbb{T}^N$$

$$\overbrace{{}_N\mathbb{L} \dashv \mathbb{T}}^{m} \underbrace{\overset{m}{\mathbb{L}} \vDash \mathbb{T}^N} = \underbrace{\mathbb{L}\mathbb{T}}\,\underbrace{{}_N\mathbb{L}\mathbb{T}^N}$$

$$\underbrace{\overbrace{\overset{m-1}{\mathbb{L}} \times \mathsf{L}}^{m}\mathbb{T}}\,\mathbb{T}^N - \mathbb{T}\times \underbrace{\overbrace{\mathbb{L}\times\mathsf{L}} \vDash \mathbb{T}^N} = \mathbb{L}\underbrace{\overbrace{\mathbb{L}\vDash\mathbb{T}}}\ \mathrm{Ind}\ \mathbb{T}^N + \overset{m}{-1}\,\mathbb{T}\times \underbrace{\overbrace{\mathsf{L}\times\mathbb{L}}\vDash\mathbb{T}^N}$$

$$= \underbrace{\mathsf{L}\vDash\mathbb{T}}\times\underbrace{\mathbb{L}\vDash\mathbb{T}^N} + \overset{m}{-1}\,\mathbb{T}\times\overbrace{\mathsf{L}\vDash\underbrace{\mathbb{L}\vDash\mathbb{T}^N}} = \mathsf{L}\vDash\ \mathrm{Der}\ \overbrace{\mathbb{T}\times\underbrace{\mathsf{T}\vDash\mathbb{T}^N}_{n+1-m}}^{n+1} = 0$$

$$\overbrace{{}_N\mathbb{L}\dashv\mathbb{T}}\underbrace{\mathbb{L}\vDash\mathbb{T}^N} = {}_N\mathbb{L}\ \overbrace{\mathbb{T}\times\underbrace{\mathbb{L}\vDash\mathbb{T}^N}} = {}_N\mathbb{L}\ \overbrace{\underbrace{\mathbb{T}\mathbb{L}}\mathbb{T}^N} = \underbrace{{}_N\mathbb{L}\mathbb{T}^N}\,\underbrace{\mathbb{L}\mathbb{T}}$$



$$\overset{\prime}{\mathbb{L}}\ \overbrace{\mathbb{L}\vDash\mathbb{T}} := \underbrace{\overset{\prime}{\mathbb{L}}\times\mathbb{L}}\,\mathbb{T}: \quad (\mathbb{T}\times)\ \overset{\prime}{\mathbb{T}} := \mathbb{T}\times\overset{\prime}{\mathbb{T}}$$

$$\overbrace{\mathbb{L}\vDash}\overbrace{\overset{\prime}{\mathbb{L}}\vDash} = \overbrace{\mathbb{L}\times\overset{\prime}{\mathbb{L}}}\vDash \underset{\mathrm{univ}}{\Longleftarrow} \overbrace{\mathsf{L}\vDash}\times\overbrace{\overset{\prime}{\mathsf{L}}\vDash} = 0$$

$$_M\mathsf{L}\ \underbrace{\overbrace{\mathbb{L}\vDash}\overbrace{\overset{\prime}{\mathbb{L}}\vDash}}\mathbb{T} = \overbrace{_M\mathsf{L}\times\mathbb{L}}\overbrace{\overset{\prime}{\mathbb{L}}\vDash\mathbb{T}} = \underbrace{\overbrace{_M\mathsf{L}\times\mathbb{L}}\times\overset{\prime}{\mathbb{L}}}\mathbb{T} = \underbrace{_M\mathsf{L}\times\overbrace{\mathbb{L}\times\overset{\prime}{\mathbb{L}}}}\mathbb{T} = {}_M\mathsf{L}\ \underbrace{\overbrace{\mathbb{L}\times\overset{\prime}{\mathbb{L}}}\vDash\mathbb{T}}$$

$$\overbrace{\mathbb{T}\times}\overbrace{\overset{\prime}{\mathbb{L}}\times} = \overbrace{\mathbb{T}\times\overset{\prime}{\mathbb{T}}}\times \underset{\mathrm{univ}}{\Longleftarrow} \overbrace{\mathsf{T}\times}\times\overbrace{\overset{\prime}{\mathsf{T}}\times} = 0$$

$$\overset{p}{\mathbb{L}} \vDash \underbrace{\times\mathsf{T}^M} = \sum_{P\subset M} \underset{M\llcorner P}{\overset{P}{\vee}} \underbrace{\mathbb{L}\overbrace{\times\mathsf{T}^P}}\,\underbrace{\times\mathsf{T}^{M\llcorner P}}$$

$$\mathsf{T}\times\underbrace{\overset{m}{\mathbb{L}}\vDash\mathbb{T}^N} = \overset{m-1}{-1}\ \underbrace{\mathbb{L}\dashv\mathsf{T}}\vDash\mathbb{T}^N: \quad \overset{k}{\mathbb{T}}\times\underbrace{\overset{m}{\mathbb{L}}\vDash\mathbb{T}^N} = \overset{k\,(m+1)}{-1}\ \underbrace{\mathbb{L}\vDash\mathbb{T}}\vDash\mathbb{T}^N$$

$$\overset{m}{⫪} \times \underbrace{\overset{m}{𝕃} \vDash 𝕋^N} = \underbrace{𝕃⫪}\, 𝕋^N$$

$$m = 1{:}\ \urcorner \times \underbrace{\llcorner \vDash 𝕋^N} = \underbrace{\llcorner\urcorner}\, 𝕋^N \Leftarrow \text{RHS} = \text{LHS} + \llcorner \vDash \underbrace{\urcorner \times 𝕋^N}_{=0}$$

$$1 \leqslant m \curvearrowright m{+}1{:}\ \overset{m-1}{-1}\, \overbrace{\llcorner \times \underbrace{𝕃 \dashv \urcorner}} \vDash 𝕋^N = \overset{m-1}{-1} \llcorner \vDash \overbrace{\underbrace{𝕃 \dashv \urcorner} \vDash 𝕋^N}\ \text{Ind} = \underset{\text{Der}}{\llcorner} \vDash \overbrace{\urcorner \times \underbrace{𝕃 \vDash 𝕋^N}} = \underbrace{\llcorner\urcorner}\underbrace{𝕃 \vDash 𝕋^N} - \urcorner \times \overbrace{\llcorner \vDash \underbrace{𝕃 \vDash 𝕋^N}}$$

$$\Rightarrow \overset{m}{-1}\, \overbrace{\underbrace{\llcorner \times 𝕃} \underset{\text{Der}}{\dashv} \urcorner} \vDash 𝕋^N = \overset{m}{-1} \left(\overbrace{\llcorner \times \underbrace{𝕃 \dashv \urcorner}} \vDash 𝕋^N + \overset{m}{-1} \underbrace{\llcorner\urcorner}\underbrace{𝕃 \vDash 𝕋^N} \right) = \urcorner \times \overbrace{\underbrace{\llcorner \times 𝕃} \vDash 𝕋^N}$$

$$\text{Ind } 0 \leqslant k{:}\ \underbrace{\overset{k}{⫪} \times \urcorner} \times \underbrace{𝕃 \vDash 𝕋^N} = ⫪ \times \overbrace{\urcorner \times \underbrace{𝕃 \vDash 𝕋^N}} = \overset{m-1}{-1} ⫪ \times \underbrace{\overbrace{𝕃 \dashv \urcorner}^{m-1} \vDash 𝕋^N}_{\text{Ind}}$$

$$= \overset{m-1}{-1}\ \overset{km}{-1}\, \overbrace{\underbrace{𝕃 \dashv \urcorner} \dashv ⫪} \vDash 𝕋^N = \overset{m-1+km}{-1}\, \overbrace{𝕃 \dashv \underbrace{\urcorner \times ⫪}} \vDash 𝕋^N = \underbrace{\overset{m-1+km}{-1}\ \overset{k}{-1}}_{=\ \overset{(k+1)(m+1)}{-1}} \overbrace{𝕃 \dashv \underbrace{\urcorner \times ⫪}} \vDash 𝕋^N$$

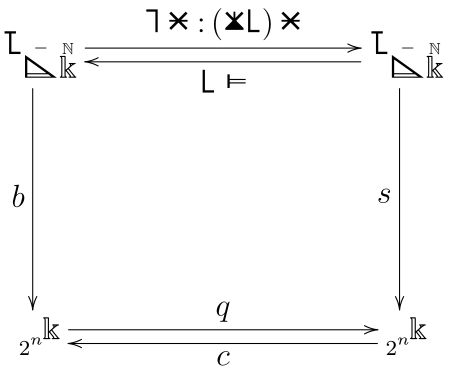
$$\overset{m}{⫪} \times \underbrace{\overset{m}{𝕃} \vDash 𝕋^N} = \underbrace{𝕃⫪}\, 𝕋^N$$

$$\overbrace{{}_N\llcorner \dashv \overset{m}{⫪}}\, \underbrace{\overset{m}{𝕃} \vDash 𝕋^N} = \underbrace{𝕃⫪}\, \underbrace{{}_N𝕃 𝕋^N}$$

$$\underbrace{\overbrace{\overset{m-1}{𝕃} \times \llcorner}}\overset{m}{⫪}\, 𝕋^N - ⫪ \times \underbrace{\overbrace{𝕃 \times \llcorner} \vDash 𝕋^N} = \overbrace{𝕃\underbrace{\llcorner \vDash ⫪}}^{\text{Ind}}\, 𝕋^N + \overset{m}{-1} ⫪ \times \underbrace{\overbrace{\llcorner \times 𝕃} \vDash 𝕋^N}$$

$$= \underbrace{\llcorner \vDash ⫪} \times \underbrace{𝕃 \vDash 𝕋^N} + \overset{m}{-1} ⫪ \times \overbrace{\llcorner \vDash \underbrace{𝕃 \vDash 𝕋^N}} = \underset{\text{Der}}{\llcorner} \vDash \overbrace{⫪ \times \underbrace{\urcorner \vDash 𝕋^N}_{n+1-m}}^{n+1} = 0$$

$$\overbrace{{}_N𝕃 \dashv ⫪}\, \underbrace{𝕃 \vDash 𝕋^N} = {}_N𝕃\, \overbrace{⫪ \times \underbrace{𝕃 \vDash 𝕋^N}} = {}_N𝕃\, \overbrace{\underbrace{⫪𝕃}\, 𝕋^N} = \underbrace{{}_N𝕃 𝕋^N}\, \underbrace{𝕃⫪}$$



$$\llcorner' \underbrace{\llcorner \models \urcorner} = \underbrace{\llcorner' \bowtie \llcorner}\urcorner : \quad {}_M\llcorner \underbrace{\llcorner \models \urcorner} = \begin{bmatrix} \llcorner \\ {}_M\lrcorner \end{bmatrix} \urcorner$$

$$\underbrace{\llcorner \models} \ast \underbrace{\llcorner' \models} = 0 = \underbrace{\llcorner \models}^2$$

$$\llcorner \models \underbrace{\urcorner \triangle \, {}^I\!\!\not{}} \urcorner' = \not{} \, \overbrace{\underbrace{\llcorner \urcorner} \models \urcorner'}$$

$${}_M\llcorner \overbrace{\underbrace{\urcorner \bowtie}}\urcorner = {}_M\llcorner \underbrace{\urcorner \bowtie \urcorner} = \sum_i^M \binom{i}{M \llcorner i} \underbrace{\llcorner \urcorner}_{i} \underbrace{{}_{M \llcorner i}\llcorner \urcorner}$$

$${}_M\llcorner \overbrace{\underbrace{\bowtie \llcorner} \bowtie \urcorner} = \sum_i^M \binom{i}{M \llcorner i} \underbrace{{}_i\llcorner \bowtie \llcorner} \underbrace{{}_{M \llcorner i}\llcorner \urcorner}$$

$$\underbrace{\urcorner \bowtie} \ast \underbrace{\urcorner' \bowtie} = 0 = \underbrace{\urcorner \bowtie}^2 = \overbrace{\underbrace{\llcorner \bowtie} \bowtie}^2$$

$$\llcorner \models \underbrace{\urcorner^p \bowtie \urcorner'} = \underbrace{\llcorner \models \urcorner} \bowtie \urcorner' + \varepsilon^p \urcorner \bowtie \underbrace{\llcorner \models \urcorner'}$$

$${}_M\llcorner \text{ LHS } = \begin{bmatrix} \llcorner \\ {}_M\lrcorner \end{bmatrix} \urcorner \bowtie \urcorner' = \sum_{P \subset M} \binom{\bullet | P}{O | M \llcorner P} \left(\begin{bmatrix} \llcorner \\ {}_P\lrcorner \end{bmatrix} \urcorner \right) \times {}_{M \llcorner P}\lrcorner \urcorner' + \binom{O | P}{\bullet | M \llcorner P} \underbrace{{}_P\lrcorner \urcorner} \times \begin{bmatrix} \llcorner \\ {}_{M \llcorner P}\lrcorner \end{bmatrix} \urcorner'$$

$$= \sum_{P \subset M} \binom{P}{M \llcorner P} \overbrace{{}_P\lrcorner \underbrace{\llcorner \models \urcorner}} \times \underbrace{{}_{M \llcorner P}\lrcorner \urcorner'} + \binom{P}{\bullet} \binom{P}{M \llcorner P} \underbrace{{}_P\lrcorner \urcorner} \times \overbrace{{}_{M \llcorner P}\lrcorner \underbrace{\llcorner \models \urcorner'}} = {}_M\llcorner \text{ RHS}$$

$$\llcorner \models \underbrace{\bowtie \urcorner}^M = \sum_i^M \binom{i}{M \llcorner i} \underbrace{\llcorner \urcorner^i} \underbrace{\bowtie \urcorner^{M \llcorner i}}$$

$$\underbrace{\llcorner \models \urcorner} \bowtie \urcorner' = \urcorner \bowtie \overbrace{\underbrace{\bowtie \llcorner} \bowtie \urcorner'}$$

$$\overbrace{\llcorner \models}^* = \underbrace{\bowtie \llcorner} \bowtie : \quad \overbrace{\urcorner \bowtie}^* = \underbrace{\urcorner \bowtie} \models$$

$$\urcorner^N \bowtie \overbrace{\underbrace{\bowtie \llcorner} \bowtie \urcorner'^M} = \text{ per } \urcorner^N \bowtie \left[\bowtie \llcorner \quad \urcorner'^M \right] = \sum_j^N \binom{j}{N \llcorner j} \overbrace{\urcorner^j \bowtie \underbrace{\bowtie \llcorner}} \underbrace{\urcorner^{N \llcorner j} \bowtie \urcorner'^M} =$$

$$\sum_j^N \binom{j}{N \llcorner j} \underbrace{\overbrace{\underbrace{\bowtie \llcorner} \bowtie \urcorner^j} \urcorner^{N \llcorner j}} \bowtie \urcorner'^M = \sum_j^N \binom{j}{N \llcorner j} \overbrace{\underbrace{\llcorner \urcorner^j}} \urcorner^{N \llcorner j} \bowtie \urcorner'^M = \underbrace{\llcorner \models \urcorner^N} \bowtie \urcorner'^M$$

$$\underbrace{\llcorner \models} \ast \underbrace{\urcorner \bowtie} = {}_{=}\underbrace{\llcorner \urcorner} \underbrace{\llcorner \models} \underbrace{\urcorner \bowtie} + \underbrace{\urcorner \bowtie} \underbrace{\llcorner \models}$$

$$\underbrace{\llcorner \models} \overbrace{\underbrace{\bowtie \llcorner'} \bowtie} + \overbrace{\underbrace{\bowtie \llcorner'} \bowtie} \underbrace{\llcorner \models} = \llcorner \bowtie \llcorner' 1$$

$$\llcorner \models \underbrace{\urcorner \bowtie \urcorner} = \underbrace{\llcorner \models \urcorner} \urcorner + \varepsilon \urcorner \bowtie \underbrace{\llcorner \models \urcorner}$$

$${}_M\llcorner \text{ (LHS } \urcorner) = \begin{bmatrix} \llcorner \\ {}_M\lrcorner \end{bmatrix} \overbrace{\underbrace{\bowtie \llcorner'} \bowtie \urcorner} + {}_M\llcorner \overbrace{\underbrace{\bowtie \llcorner'} \bowtie \underbrace{\llcorner \models \urcorner}} = \underbrace{\llcorner \bowtie \llcorner'} \underbrace{{}_M\lrcorner \urcorner}$$

$$-\sum_{i}^{M} \bigvee_{M \llcorner i}^{i} \underbrace{\llcorner \times \llcorner'}_{i} \begin{bmatrix} \llcorner \\ {}_{M \llcorner i}\llcorner \rrbracket \end{bmatrix} + \sum_{i}^{M} \bigvee_{M \llcorner i}^{i} \underbrace{\llcorner \times \llcorner'}_{i} \underbrace{{}_{M \llcorner i}\llcorner \llcorner \vDash \rrbracket}$$

$$\times \overbrace{\underbrace{\rrbracket \times} \vDash \urcorner} = \underbrace{\urcorner \times} \vDash \rrbracket \text{ als form}$$

$$\overbrace{\rrbracket \times}' \times \overbrace{\underbrace{\rrbracket \to} \vDash \urcorner} = \overbrace{\underbrace{\rrbracket \times} \vDash \urcorner} \overset{*}{\times} \overbrace{\rrbracket \times}' = \overbrace{\underbrace{\rrbracket \times} \vDash \llcorner' \rrbracket}^{*} = \overbrace{\underbrace{\rrbracket \times} \underbrace{\urcorner \times' \rrbracket}}^{*} = \rrbracket \overset{*}{\times} \underbrace{\urcorner \times' \rrbracket} = \underbrace{\urcorner \times' \rrbracket} \times \rrbracket = \rrbracket' \times \overbrace{\underbrace{\urcorner \times} \vDash \rrbracket}$$

$$\begin{array}{ccc} \ulcorner_{\triangle}^{-\,\mathbb{N}}\Bbbk & \overset{\urcorner \times : (\times \llcorner) \times}{\underset{\llcorner \vDash}{\rightleftarrows}} & \ulcorner_{\triangle}^{-\,\mathbb{N}}\Bbbk \\ b \downarrow & & \downarrow s \\ {}_{2^n}\Bbbk & \overset{q}{\underset{c}{\rightleftarrows}} & {}_{2^n}\Bbbk \end{array}$$

$$\llcorner' \underbrace{\llcorner \vDash \rrbracket} = \underbrace{\llcorner' \times \llcorner} \rrbracket: \quad {}_{M}\llcorner \underbrace{\llcorner \vDash \rrbracket} = \begin{bmatrix} \llcorner \\ {}_{M}\llcorner \end{bmatrix} \rrbracket$$

$$\underbrace{\llcorner \vDash} * \underbrace{\llcorner' \vDash} = 0 = \underbrace{\llcorner \vDash}^{2}$$

$$\llcorner \vDash \underbrace{\ulcorner_{\triangle} \overset{I}{\not\sim}} \rrbracket' = \not\sim \overbrace{\underbrace{\llcorner \ulcorner} \vDash \rrbracket'}$$

$${}_{M}\llcorner \overbrace{\underbrace{\urcorner \times} \rrbracket} = {}_{M}\llcorner \underbrace{\urcorner \times \rrbracket} = \sum_{i}^{M} \bigvee_{M \llcorner i}^{i} \underbrace{\llcorner \urcorner}_{i} \underbrace{{}_{M \llcorner i}\llcorner \rrbracket}$$

$${}_{M}\llcorner \overbrace{\underbrace{\times \llcorner} \times \rrbracket} = \sum_{i}^{M} \bigvee_{M \llcorner i}^{i} \underbrace{\llcorner \times \llcorner}_{i} \underbrace{{}_{M \llcorner i}\llcorner \rrbracket}$$

$$\underbrace{\urcorner \times} * \underbrace{\urcorner' \times} = 0 = \underbrace{\urcorner \times}^{2} = \overbrace{\underbrace{\llcorner \times} \times}^{2}$$

$$\llcorner \vDash \underbrace{\overset{p}{\rrbracket} \times \rrbracket'} = \underbrace{\llcorner \vDash \rrbracket} \times \rrbracket' + \varepsilon^{p} \rrbracket \times \underbrace{\llcorner \vDash \rrbracket'}$$

$${}_{M}\llcorner \text{ LHS } = \begin{bmatrix} \llcorner \\ {}_{M}\llcorner \end{bmatrix} \rrbracket \times \rrbracket' = \sum_{P \subset M} \bigvee_{O|M \llcorner P}^{\bullet|P} \left(\begin{bmatrix} \llcorner \\ {}_{P}\llcorner \end{bmatrix} \rrbracket \right) \times {}_{M \llcorner P}\llcorner' \rrbracket + \bigvee_{\bullet|M \llcorner P}^{O|P} \underbrace{{}_{P}\llcorner \rrbracket} \times \begin{bmatrix} \llcorner \\ {}_{M \llcorner P}\llcorner \end{bmatrix} \rrbracket'$$

$$= \sum_{P \subset M} \bigvee_{M \llcorner P}^{P} \overbrace{{}_{P}\llcorner \underbrace{\llcorner \vDash \rrbracket}} \times \underbrace{{}_{M \llcorner P}\llcorner' \rrbracket} + \bigvee_{\bullet}^{P} \bigvee_{M \llcorner P}^{P} \underbrace{{}_{P}\llcorner \rrbracket} \times \overbrace{{}_{M \llcorner P}\llcorner \underbrace{\llcorner \vDash \rrbracket'}} = {}_{M}\llcorner \text{ RHS}$$

$$\llcorner \vDash \underbrace{\times \urcorner^{M}} = \sum_{i}^{M} \bigvee_{M \llcorner i}^{i} \underbrace{\llcorner \urcorner^{i}} \underbrace{\times \urcorner^{M \llcorner i}}$$

$$\underbrace{\llcorner \models \urcorner\!\rrbracket} \,\ast\, \acute{\rrbracket} = \rrbracket \ast \overbrace{\underbrace{\ast\llcorner}\ast\acute{\rrbracket}}$$

$$\overbrace{\llcorner \models}^{*} = \underbrace{\ast\llcorner}\ast : \quad \overbrace{\urcorner\ast}^{*} = \underbrace{\urcorner\ast} \models$$

$$\urcorner^{N} \ast \overbrace{\underbrace{\ast\llcorner}\ast\acute{\urcorner}}^{M} = \det \urcorner^{N} \ast \left[\ast\llcorner \quad \acute{\urcorner}^{M}\right] = \sum_{j}^{N} \binom{j}{N\llcorner j} \overbrace{\acute{\urcorner}^{j} \ast \underbrace{\ast\llcorner}} \underbrace{\urcorner^{N\llcorner j} \ast \acute{\urcorner}^{M}} =$$

$$\sum_{j}^{N} \binom{j}{N\llcorner j} \underbrace{\overbrace{\underbrace{\ast\llcorner} \ast \acute{\urcorner}^{j}} \urcorner^{N\llcorner j}} \ast \acute{\urcorner}^{M} = \sum_{j}^{N} \binom{j}{N\llcorner j} \overbrace{\underbrace{\llcorner\acute{\urcorner}^{j}} \urcorner^{N\llcorner j}} \ast \acute{\urcorner}^{M} = \underbrace{\llcorner \models \urcorner^{N}} \ast \acute{\urcorner}^{M}$$

$$\underbrace{\llcorner \models} \ast \underbrace{\urcorner\ast} = {}_{=}\underbrace{\llcorner\urcorner}\, \underbrace{\llcorner \models} \underbrace{\urcorner\ast} + \underbrace{\urcorner\ast} \underbrace{\llcorner \models}$$

$$\underbrace{\llcorner \models} \overbrace{\underbrace{\ast\acute{\llcorner}}\ast} + \overbrace{\underbrace{\ast\acute{\llcorner}}\ast} \underbrace{\llcorner \models} = \llcorner \ast \acute{\llcorner} 1$$

$$\llcorner \models \underbrace{\urcorner\ast\rrbracket} = \underbrace{\llcorner \models \urcorner} \rrbracket + \varepsilon \urcorner\ast \underbrace{\llcorner \models \rrbracket}$$

$${}_{M}\llcorner \; (\text{ LHS } \rrbracket) = \begin{bmatrix} \llcorner & \\ & {}_{M}\llcorner \end{bmatrix} \overbrace{\underbrace{\ast\acute{\llcorner}}\ast\rrbracket} + {}_{M}\llcorner \overbrace{\underbrace{\ast\acute{\llcorner}}\ast \underbrace{\llcorner \models \rrbracket}} = \underbrace{\llcorner \ast \acute{\llcorner}} \underbrace{{}_{M}\llcorner\rrbracket}$$

$$-\sum_{i}^{M} \binom{i}{M\llcorner i} \underbrace{{}_{i}\llcorner \ast \acute{\llcorner}} \begin{bmatrix} \llcorner & \\ & {}_{M\llcorner i}\llcorner\rrbracket \end{bmatrix} + \sum_{i}^{M} \binom{i}{M\llcorner i} \underbrace{{}_{i}\llcorner \ast \acute{\llcorner}} \underbrace{{}_{M\llcorner i}\llcorner\llcorner \models \rrbracket}$$

$$\ast \overbrace{\underbrace{\rrbracket\ast} \models \urcorner} = \underbrace{\urcorner\ast} \models \rrbracket \text{ als form}$$

$$\overbrace{\acute{\rrbracket}\ast} \ast \overbrace{\underbrace{\rrbracket \rightarrow} \models \urcorner} = \overbrace{\underbrace{\rrbracket\ast} \models \urcorner} \overset{*}{\ast} \overbrace{\acute{\rrbracket}\ast} = \overbrace{\underbrace{\overbrace{\rrbracket\ast} \models \llcorner}\acute{\rrbracket}}^{*} = \overbrace{\underbrace{\rrbracket\ast}\underbrace{\urcorner\ast\acute{\rrbracket}}}^{*} = \rrbracket \overset{*}{\ast} \underbrace{\urcorner\ast\acute{\rrbracket}} = \underbrace{\urcorner\ast\acute{\rrbracket}} \ast \rrbracket = \acute{\rrbracket} \ast \overbrace{\underbrace{\urcorner\ast} \models \rrbracket}$$