

$$\mathbb{H}^{\mathbb{N}} \xleftarrow{\mathbb{L}'} 2^n \mathbb{C}$$

$$\mathbb{H}^{\mathbb{N}} \ni \mathbb{L}^J = \sum_{j \in J} \mathbb{L}^j \quad \text{dual standard basis}$$

$$\mathbb{L}^I \times \mathbb{L}^J = \mathbb{L}^I \cdot \mathbb{L}^J = \det \mathbb{L}^i \times \mathbb{L}^j = \det \mathbb{L}^i \cdot \mathbb{L}^j = \mathbb{L}^I \cdot \mathbb{L}^J = \mathbb{L}^{I \cup J}$$

$$\times \mathbb{L}^I = \mathbb{L}^I \cdot \mathbb{L}^I$$

$$\mathbb{L}^I = (\times \mathbb{L}^I) \cdot \mathbb{L}^I$$

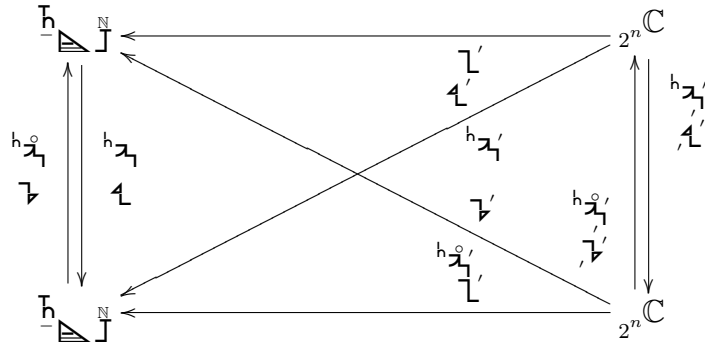
$$\ast \mathbb{L}^I = \mathbb{L}^{N \setminus I} \cdot \mathbb{L}^I$$

$$\mathbb{L}^I = \mathbb{L}^I \cdot \mathbb{L}^I \quad \mathbb{L}^I \cdot \mathbb{L}^I = \det (\mathbb{L}^I \cdot \mathbb{L}^I) = \det \mu \delta^I = \mu \delta^I$$

$$\mathbb{L}^I = \mathbb{L}^I \cdot \mathbb{L}^I$$

$$\mathbb{L}^I \cdot \mathbb{L}^J = \det \mathbb{L}^i \cdot \mathbb{L}^j = \det \delta^j = \delta^J = \mathbb{L}^I \cdot \mathbb{L}^J$$

$$\mathbb{L}^I = \mathbb{L}^I$$



$$\mathbb{L}^I \times \mathbb{L}^J = \begin{cases} \mathbb{L}^I \cdot \mathbb{L}^J = \mathbb{L}^{I \cup J} \\ \mathbb{L}^I \cdot \mathbb{L}^J = \mathbb{L}^I \cdot \mathbb{L}^J = \det \mathbb{L}^i \times \mathbb{L}^j = \det \mathbb{L}^i \cdot \mathbb{L}^j = \mathbb{L}^I \cdot \mathbb{L}^J = \mathbb{L}^{I \cup J} \end{cases}$$

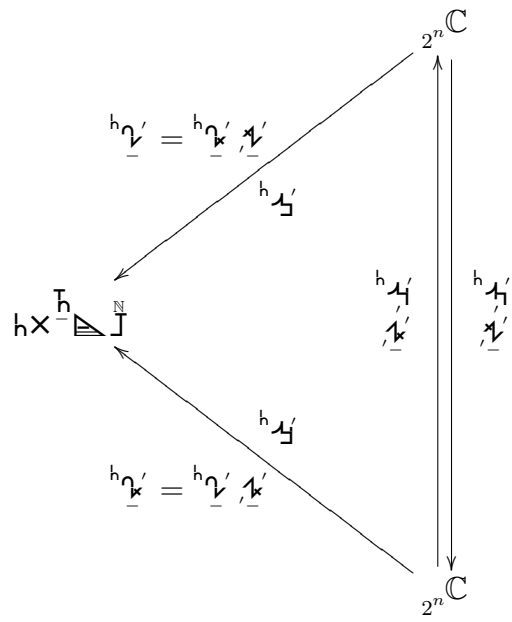
$$\sum_{|I|=|J|} \mathbb{L}^I \cdot \mathbb{L}^J$$

$$\mathbb{L}^J = \sum_{|I|=|J|} (\times \mathbb{L}^I) \cdot \mathbb{L}^J$$

$$\mathbb{L}^I \cdot \sum_{|I|=|J|} \mathbb{L}^I \cdot \mathbb{L}^J = \sum_{|I|=|J|} \mu \delta^I \cdot \mathbb{L}^J = \mu \mathbb{L}^J = \mathbb{L}^I \cdot \sum_{|I|=|J|} \mathbb{L}^J$$



$$\begin{aligned}
\mathcal{L}^J &= \begin{cases} \mathfrak{h}^{\circ} \mathfrak{a}_1 \mathfrak{h}^J & = \mathfrak{h}^{\circ L} \mathfrak{h}^J \\ \mathfrak{b} \mathfrak{a}^J & = \mathfrak{b}^L \mathfrak{a}^J \end{cases} \\
\mathcal{L}'^{\mathfrak{a}} &= \begin{cases} \mathfrak{h}^{\circ} \mathfrak{a}_1 \mathfrak{h}^{\circ \mathfrak{a}} & = \mathfrak{h}^{\circ} \mathfrak{h}^{\circ \mathfrak{a}} \\ \mathfrak{a} \mathfrak{b}'^{\mathfrak{a}} & = \mathfrak{a}' \mathfrak{b}'^{\mathfrak{a}} \end{cases} \\
\mathcal{L}^N &= \begin{cases} \mathfrak{h}^{\circ} \mathfrak{a}_1 \mathfrak{h}^{\circ N} & = \mathfrak{h}^{\circ K} \mathfrak{h}^{\circ N} \\ \mathfrak{a} \mathfrak{b}^N & = \mathfrak{a}^K \mathfrak{b}^N \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ \mathfrak{a}} \mathfrak{h} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} = \mathfrak{h}^{\circ} \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \\ \mathfrak{a}' \mathfrak{h} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} = \mathfrak{a}' \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ J} & = \mathcal{L}^L \mathfrak{h}^J = \mathfrak{h}^{\circ} \mathcal{L}^J \\ \mathfrak{a}^J & = \mathcal{L}^L \mathfrak{a}^J = \mathfrak{a} \mathcal{L}^J \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ \mathfrak{a}} \mathfrak{h} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} = \mathfrak{h}^{\circ} \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \\ \mathfrak{b}'^{\mathfrak{a}} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{b}'^{\mathfrak{a}} = \mathfrak{b}' \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ N} & = \mathcal{L}^K \mathfrak{h}^{\circ N} = \mathfrak{h}^{\circ} \mathcal{L}^N \\ \mathfrak{b}^N & = \mathcal{L}^K \mathfrak{b}^N = \mathfrak{b} \mathcal{L}^N \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ \mathfrak{a}} \mathfrak{h} & = \mathcal{L}^{\mathfrak{a}} \mathfrak{h} = \mathfrak{h}^{\circ} \mathcal{L}^{\mathfrak{a}} \mathfrak{h} \\ \mathfrak{a}' \mathfrak{h} & = \mathcal{L}^{\mathfrak{a}} \mathfrak{h} = \mathfrak{a}' \mathcal{L}^{\mathfrak{a}} \mathfrak{h} \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ J} & = \mathcal{L}^M \mathfrak{h}^J = \mathfrak{h}^{\circ} \mathcal{L}^J \\ \mathfrak{a}^J & = \mathcal{L}^M \mathfrak{a}^J = \mathfrak{a} \mathcal{L}^J \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ \mathfrak{a}} \mathfrak{h} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} = \mathfrak{h}^{\circ} \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \\ \mathfrak{b}'^{\mathfrak{a}} & = \mathcal{L}'^{\mathfrak{a}} \mathfrak{b}'^{\mathfrak{a}} = \mathfrak{b}' \mathcal{L}'^{\mathfrak{a}} \mathfrak{h} \end{cases} \\
\begin{cases} \mathfrak{h}^{\circ N} & = \mathcal{L}^I \mathfrak{h}^{\circ N} = \mathfrak{h}^{\circ} \mathcal{L}^N \\ \mathfrak{b}^N & = \mathcal{L}^I \mathfrak{b}^N = \mathfrak{b} \mathcal{L}^N \end{cases}
\end{aligned}$$



$h X-h N \ni h \gamma^j$  holonomic basis

$$1 = \underbrace{1_h}_{h \gamma^j} 1$$

$$M \delta^N = M \underbrace{1_h}_{h \gamma^N}$$



$$* \mathbb{h}^I \mathbb{q}^I = \mathbb{h}^I \mathbb{q}^{N-I} \overline{I > \mathbb{O}^{N-I}} \eta^I$$

$$\mathbb{H} = \begin{cases} \mathbb{h}^I \mathbb{z}^I \mathbb{H} \\ \mathbb{b}_h \mathbb{h}^I \mathbb{H} \end{cases}$$

$${}_I \delta^J = \begin{cases} \mathbb{h}^I \mathbb{z}^J \\ \mathbb{b}_h \mathbb{h}^J \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^I = \mathbb{h}^I \mathbb{z}^I \mathbb{H} \\ \mathbb{h}^I \mathbb{q}^I = \mathbb{h}^I \mathbb{q}^I \mathbb{H} \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^J = \mathbb{z}_h^L \mathbb{h}^I \mathbb{z}^J \\ \mathbb{h}^I \mathbb{q}^J = \mathbb{h}^I \mathbb{q}^L \mathbb{q}^J \end{cases}$$

$$\mathbb{h}^I \mathbb{q}^I = \begin{cases} \mathbb{h}^I \mathbb{z}^I \mathbb{q}^I \\ \mathbb{h}^I \mathbb{q}^I \mathbb{q}^I \end{cases}$$

$$\mathbb{h}^I \mathbb{q}^N = \begin{cases} \mathbb{h}^I \mathbb{z}^K \mathbb{h}^I \mathbb{z}^N \\ \mathbb{h}^I \mathbb{q}^K \mathbb{q}^N \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^I \mathbb{H} = \mathbb{z}_h \mathbb{h}^I \mathbb{z}^I \mathbb{H} \\ \mathbb{h}^I \mathbb{q}^I \mathbb{H} = \mathbb{z}_h \mathbb{h}^I \mathbb{q}^I \mathbb{H} \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^J = \mathbb{z}_M \mathbb{z}_h \mathbb{h}^I \mathbb{z}^J \\ \mathbb{h}^I \mathbb{q}^J = \mathbb{z}_M \mathbb{z}_h \mathbb{h}^I \mathbb{q}^J \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^I \mathbb{q}^I = \mathbb{h}^I \mathbb{z}^I \mathbb{h}^I \mathbb{q}^I \\ \mathbb{h}^I \mathbb{q}^I \mathbb{q}^I = \mathbb{z}_h \mathbb{h}^I \mathbb{q}^I \mathbb{q}^I \end{cases}$$

$$\begin{cases} \mathbb{h}^I \mathbb{z}^I \mathbb{q}^N = \mathbb{h}^I \mathbb{z}^I \mathbb{h}^I \mathbb{q}^N \\ \mathbb{h}^I \mathbb{q}^I \mathbb{q}^N = \mathbb{z}_h \mathbb{h}^I \mathbb{q}^I \mathbb{q}^N \end{cases}$$

