

$$\mathbb{h}_{\infty}^{\mathbb{h}} \mathbb{C}^{\mathbb{N}} \xleftarrow{\mathbb{l}'} \underbrace{\mathbb{h}_{\infty}^{\mathbb{h}} \mathbb{C}}_{2^n}$$

$$\mathbb{h}_{\infty}^{\mathbb{h}} \mathbb{C}^{\mathbb{N}} \ni \mathbb{l}^j = \sum_{j \in \mathbb{N}} \mathbb{l}^j \quad \text{dual standard basis}$$

$$\mathbb{l}^I \mathbb{l}^J = \det \mathbb{l}^i \mathbb{l}^j = \det {}_i \delta^j = {}_I \delta^J = {}_I \mathbb{l} \mathbb{l}^J$$

$$\mathbb{l}^I = {}_I \mathbb{l}$$

$$\mathbb{l}^I \times \mathbb{l}^J = \mathbb{l}^I \mathring{\eta} \mathbb{l}^J = \det \mathbb{l}^i \times \mathbb{l}^j = \det {}_i \eta^j = {}_I \eta^J = {}_I \mathring{\eta}^J$$

$$\times {}_I \mathbb{l} = \mathbb{l}^I {}_I \eta^I$$

$$\mathbb{l}^I = (\times {}_I \mathbb{l}) {}_I \eta^I$$

$$\ast \mathbb{l}^I = \mathbb{l}^{N-I} \overline{{}_I \delta^{N-I}} {}_I \eta^I$$

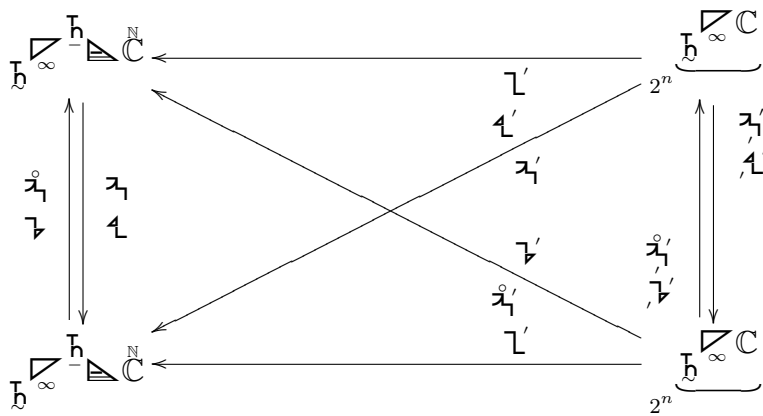
$$\mathbb{l}^I = \mathbb{l} \underline{\mathbb{l}^I \mathbb{l}^I}$$

$${}_M \mathbb{l} \mathbb{l}^N = \det ({}_M \mathbb{l} \mathbb{l}^N) = \det {}_M \delta^N = {}_M \delta^N$$

$$\mathbb{l}^I = \mathbb{l} \underline{\mathbb{l}^I \mathbb{l}^I}$$

$$\mathbb{l}^I \mathbb{l}^J = \det \mathbb{l}^i \mathbb{l}^j = \det {}_i \delta^j = {}_I \delta^J = {}_I \mathbb{l} \mathbb{l}^J$$

$$\mathbb{l}^I = {}_I \mathbb{l}$$



$$\mathbb{l}^I \times \mathbb{l}^J = \begin{cases} \mathbb{l}^I \mathbb{l}^J = \mathbb{l}^{IJ} \\ \mathbb{l}^I \mathbb{l}^J = {}_I \mathbb{l} \mathbb{l}^J = \det \mathbb{l}^i \times \mathbb{l}^j = \det {}_I \mathbb{l}^j = {}_I \mathbb{l}^J \end{cases}$$

$$\tilde{\mathbf{x}}_J \mathbf{l} = \sum_{|I|=|J|} \mathbf{l}^I \mathbf{z}_I \mathbf{4}^J$$

$$\mathbf{l}^J = \sum_{|I|=|J|} \left(\tilde{\mathbf{x}}_I \mathbf{l} \right) \mathbf{l}_I \mathbb{V}_z^J$$

$${}_M \mathbf{l} \sum_I \mathbf{l}^I \mathbf{4}_I^J = \sum_I {}_M \delta^I \mathbf{4}_I^J = {}_M \mathbf{4}^J = {}_M \mathbf{l} \tilde{\mathbf{x}}_J \mathbf{l}$$

$${}_M \mathbf{l} \mathbf{l}^J = {}_M \delta^J = \det_M \left(\mathbb{V}_z^z \mathbf{4} \right)^J = \sum_{|I|=|J|} {}_M \mathbb{V}_z^I \mathbf{z}_I \mathbf{4}^J = \sum_I \left({}_M \mathbf{l} \times \mathbf{l} \right) \mathbf{z}_I \mathbf{4}^J$$

$$\tilde{\mathbf{x}}_I \mathbb{V} = \mathbf{4}^I \eta^I$$

$$\mathbf{x} \mathbf{4}^I = \left(\mathbb{V} \right)_I \eta^I$$

$$\mathbb{H}_{\mathbb{C}} \ni \begin{cases} \mathbf{z}_1^J & = \mathbf{z}_1 \mathbf{l} \\ \mathbf{4}^J & = \sum_{j \in J} \mathbf{4}^j = \mathbf{4} \mathbf{l}^J \end{cases} \text{ dual ONBasis}$$

$$\begin{cases} \mathbf{z}_1 & = \mathbf{z}_1^I \mathbf{l} \\ \mathbf{4} & = \mathbf{4}^I \mathbf{l} \end{cases}$$

$$\begin{cases} \mathbf{z}_1^I \mathbf{x} \mathbf{z}_1^J = \mathbf{z}_1^I \mathbf{4} \mathbf{z}_1^J = \mathbf{z}_1^I \overline{\mathbf{z}_1 \mathbf{z}_1^J} = \mathbf{z}_1^I \mathbf{z}_1 \mathbf{z}_1^J = \mathbf{z}_1^I \mathbf{z}_1 \mathbf{z}_1^J & = \mathbf{z}_1^I \mathbf{z}_1^I \overline{\mathbf{z}_1^J} \\ \mathbf{4}^I \mathbf{x} \mathbf{4}^J = \det \mathbf{4}^i \left(\mathbb{V} \eta \mathbb{V} \right) \mathbf{4}^j = \det \left(\mathbb{V} \mathbf{4}^i \right) \eta \left(\mathbb{V} \mathbf{4}^j \right) = \det \mathbf{l} \eta \mathbf{l}^j = \mathbf{4}^I \mathbb{V} \mathbf{4}^J = \mathbf{4}^I \overline{\mathbb{V} \mathbf{z}_1^J} \mathbf{4}^J = \mathbb{V} \mathbf{4}^I \mathbf{z}_1^J \mathbf{4}^J & = \mathbf{4}^I \mathbf{l}^I \overline{\mathbf{z}_1^J} \end{cases}$$

$$\mathbf{z}_z \mathbf{4}^I = \mathbf{4}^{N-I} \overline{\mathbb{V} \mathbf{z}_z^I} \eta^I$$

$$\mathbf{z}_z \mathbf{l}^J = \sum_{|I|=|J|} \mathbf{l}^{N-I} \overline{\mathbb{V} \mathbf{z}_z^I} \mathbf{l}_I \mathbb{V}_z^J \left(\eta^N / \mathbb{V}_z^N \right)^{1/2}$$

$$\mathbf{4}^N = c \mathbf{l}^N$$

$${}_N \eta^N = \mathbf{4}^N \mathbf{x}_z \mathbf{4}^N = c^2 \mathbf{l}^N \mathbf{x}_z \mathbf{l}^N = c^2 \mathbb{V}_z^N \Rightarrow \text{LHS} = \sum_I \mathbf{l} \mathbf{l} \mathbf{4}^N \mathbf{l}_I \mathbb{V}_z^J = \sum_I \mathbf{l} \mathbf{l} \mathbf{l}^N \left(\eta^N / \mathbb{V}_z^N \right)^{1/2} \mathbf{l}_I \mathbb{V}_z^J = \text{RHS}$$

$$\mathbf{4}_I = \begin{cases} \mathbf{z}_1^I \mathbf{z}_1^J \\ \mathbb{V} \mathbf{4}^I \mathbf{4}_I \end{cases} \quad \mathbf{l}_I \delta^J = \begin{cases} \mathbf{z}_1^I \mathbf{z}_1^J \\ \mathbb{V} \mathbf{4}^I \mathbf{4}_I \end{cases}$$

$$\mathbf{4}_I = \begin{cases} \mathbf{z}_1^I \mathbf{z}_1^J \\ \mathbf{4} \mathbb{V}^I \mathbf{4}_I \end{cases}$$

$$M\delta^N = \begin{cases} \mathfrak{z}_M \mathfrak{z}_1^{\circ N} \\ \mathfrak{z}_M \mathfrak{z}_1^N \end{cases}$$

$$\mathfrak{z}' \mathfrak{z} = \begin{cases} \mathfrak{z}' \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} \\ \mathfrak{z}' \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} \end{cases}$$

$$\mathfrak{z}^J = \begin{cases} \mathfrak{z}^J \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J \\ \mathfrak{z}^J \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J \end{cases}$$

$$\mathfrak{z}' \mathfrak{z}' = \begin{cases} \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \\ \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \end{cases}$$

$$\mathfrak{z}^N = \begin{cases} \mathfrak{z}^N \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N \\ \mathfrak{z}^N \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N \end{cases}$$

$$\begin{cases} \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} \\ \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} = \mathfrak{z}' \mathfrak{z}' \mathfrak{z} \end{cases}$$

$$\begin{cases} \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J \\ \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J = \mathfrak{z}^L \mathfrak{z}^J \end{cases}$$

$$\begin{cases} \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \\ \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \end{cases}$$

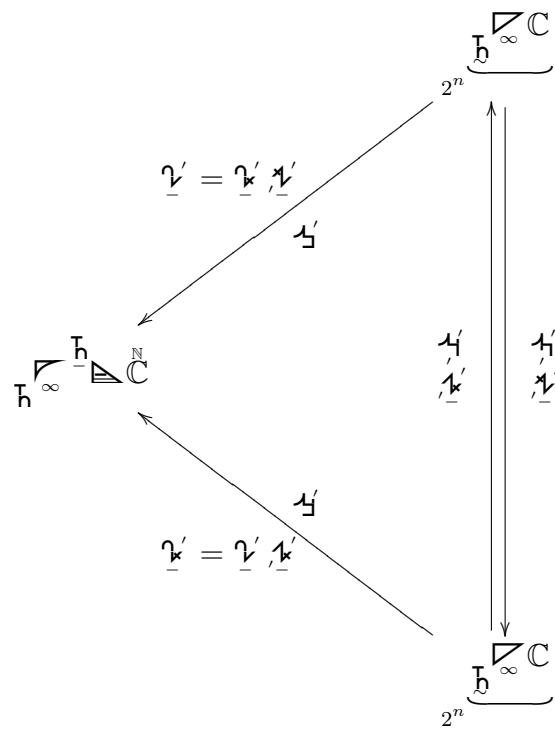
$$\begin{cases} \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N \\ \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N = \mathfrak{z}^K \mathfrak{z}^N \end{cases}$$

$$\begin{cases} \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \\ \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \end{cases}$$

$$\begin{cases} \mathfrak{z}_M^J = \mathfrak{z}_M \mathfrak{z}_M^J = \mathfrak{z}_M \mathfrak{z}_M^J \\ \mathfrak{z}_M^J = \mathfrak{z}_M \mathfrak{z}_M^J = \mathfrak{z}_M \mathfrak{z}_M^J \end{cases}$$

$$\begin{cases} \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \\ \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' = \mathfrak{z}' \mathfrak{z}' \mathfrak{z}' \end{cases}$$

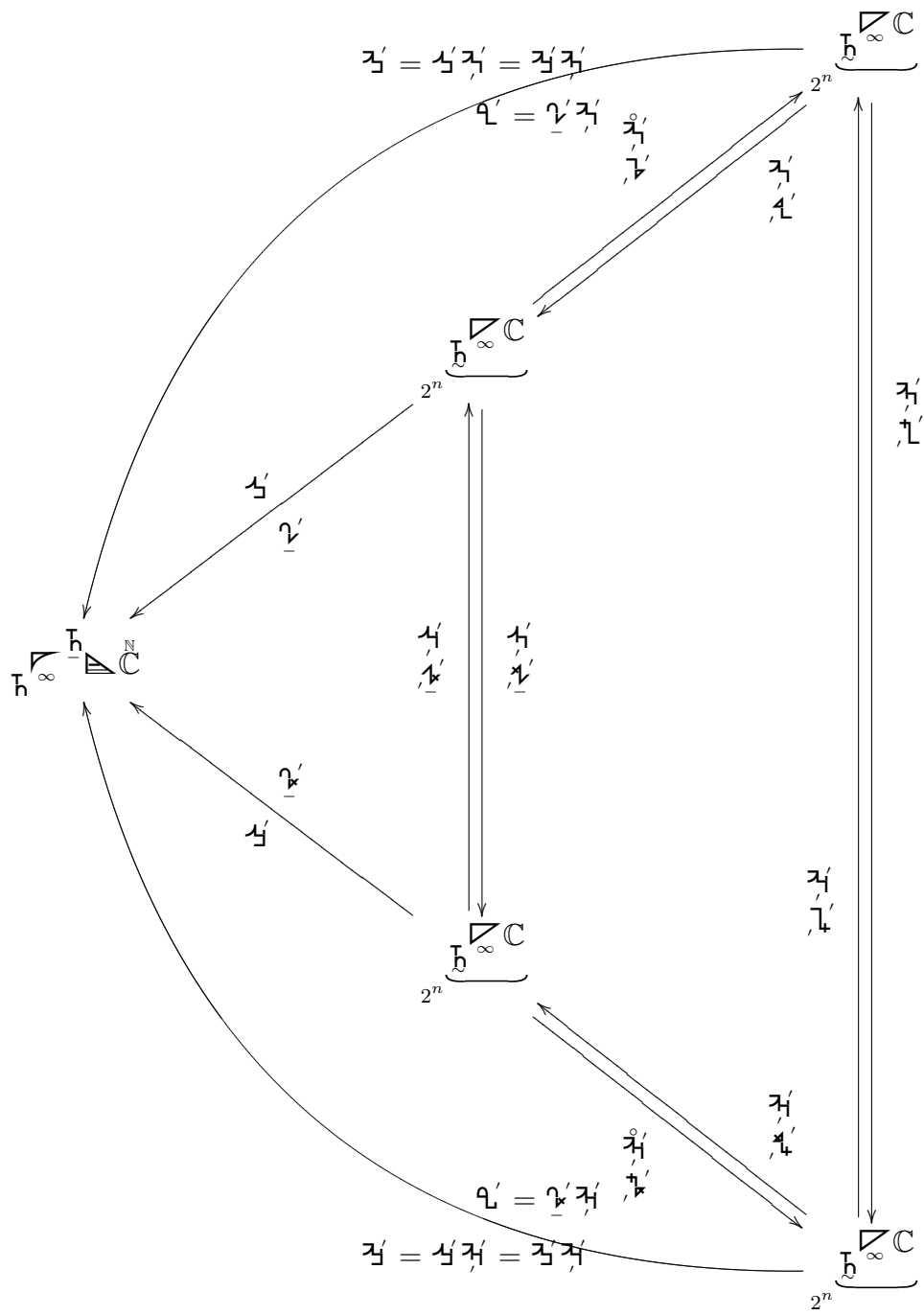
$$\begin{cases} \mathfrak{z}_I^N = \mathfrak{z}_I \mathfrak{z}_I^N = \mathfrak{z}_I \mathfrak{z}_I^N \\ \mathfrak{z}_I^N = \mathfrak{z}_I \mathfrak{z}_I^N = \mathfrak{z}_I \mathfrak{z}_I^N \end{cases}$$



$H^\infty C^N \ni \gamma^j$ holonomic basis

$$1 = \underbrace{1, \gamma^j, 1}$$

$${}_M \delta^N = \underbrace{{}_M 1, \gamma^N}$$



$$\mathcal{H}_\infty^{\mathbb{C}} \otimes \mathbb{C}^2 \ni \begin{cases} z^j & * \\ q^j & = \sum_{j \in J} q^j \end{cases} \text{ dual ONbasis}$$

$$q^I \otimes q^J = \eta^J$$

$$\mathbf{x}_I \mathbf{b} = \mathbf{a}_I \eta^I$$

$$\mathbf{a}_I = (\mathbf{x}_I \mathbf{b}) \eta^I$$

$$* \mathbf{a}_I = \mathbf{a}^{N-I} \overline{I > \overline{N-I}} \eta^I$$

$$\mathbf{a}_I = \begin{cases} \mathbf{x}_I \mathbf{b}_I \\ \mathbf{b}_I \mathbf{a}_I \end{cases}$$

$${}_I \delta^J = \begin{cases} \mathbf{x}_I \mathbf{x}_J \\ \mathbf{b}_I \mathbf{a}_J \end{cases}$$

$$\begin{cases} \mathbf{x}_I \mathbf{b}_I = \mathbf{v}_I \mathbf{x}_I \mathbf{b}_I \\ \mathbf{b}_I \mathbf{a}_I = \mathbf{v}_I \mathbf{b}_I \mathbf{a}_I \end{cases} \begin{cases} \mathbf{x}_I^J = \mathbf{v}_I^L \mathbf{x}_I^J \\ \mathbf{b}_I^J = \mathbf{v}_I^L \mathbf{b}_I^J \end{cases}$$

$$\mathbf{v}_I \mathbf{a}_I = \begin{cases} \mathbf{x}_I \mathbf{x}_I \mathbf{a}_I \\ \mathbf{b}_I \mathbf{b}_I \mathbf{a}_I \end{cases}$$

$$\mathbf{v}_I^N = \begin{cases} \mathbf{x}_I^K \mathbf{x}_I^K \mathbf{a}_I^N \\ \mathbf{b}_I^K \mathbf{b}_I^K \mathbf{a}_I^N \end{cases}$$

$$\begin{cases} \mathbf{x}_I \mathbf{b}_I = \mathbf{u}_I \mathbf{x}_I \mathbf{b}_I \\ \mathbf{b}_I \mathbf{a}_I = \mathbf{u}_I \mathbf{b}_I \mathbf{a}_I \end{cases} \begin{cases} \mathbf{x}_I^J = \mathbf{u}_I^M \mathbf{x}_I^J \\ \mathbf{b}_I^J = \mathbf{u}_I^M \mathbf{b}_I^J \end{cases}$$

$$\begin{cases} \mathbf{x}_I \mathbf{a}_I = \mathbf{x}_I \mathbf{v}_I \mathbf{a}_I \\ \mathbf{b}_I \mathbf{a}_I = \mathbf{b}_I \mathbf{v}_I \mathbf{a}_I \end{cases} \begin{cases} \mathbf{x}_I^N = \mathbf{x}_I \mathbf{v}_I^N \\ \mathbf{b}_I^N = \mathbf{b}_I \mathbf{v}_I^N \end{cases}$$

