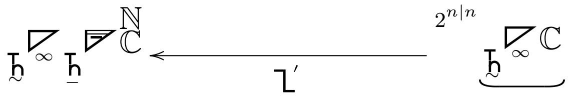


$$\mathfrak{h}_{\infty}\,\mathfrak{h}\,\mathbb{C}^{\mathbb{N}} \ni \lrcorner^{J} = \bigwedge_{j\in J} \lrcorner^{j} \quad \text{dual standard basis}$$

$$\overset{*}{\lrcorner}^{I}\,\lrcorner^{J} = \det\,\overset{*}{\lrcorner}^{i}\,\lrcorner^{j} = \det\,{}_{i}\delta^{j} = {}_{I}\delta^{J} = {}_{I}\lrcorner\,\lrcorner^{J}$$

$$\overset{*}{\lrcorner}^{I} = {}_{I}\lrcorner$$

$$\lrcorner^{I}\,\bigstar\,\lrcorner^{J} = \overset{*}{\lrcorner}^{I}\,\overset{-1}{\eta}\,\lrcorner^{J} = \det\,\lrcorner^{i}\,\bigstar\,\lrcorner^{j} = \det\,{}_{i}\eta^{j} = {}_{I}\eta^{J} = {}_{I}\overset{-1}{\eta}{}^{J}$$

$$\blacktriangle\,{}_{I}\lrcorner = \lrcorner^{I}\,{}_{I}\eta^{I}$$

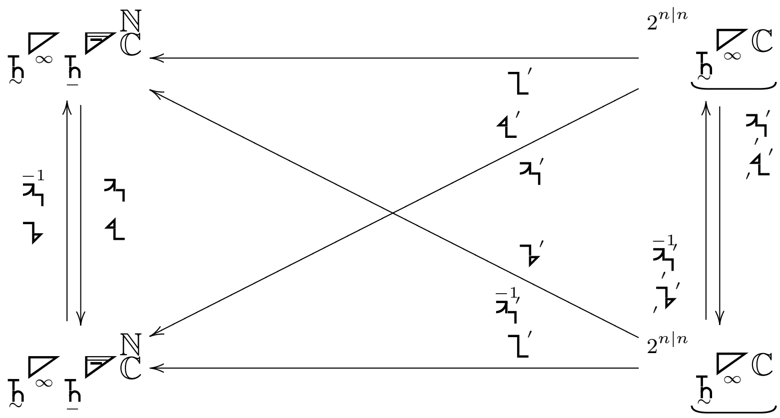
$$\lrcorner^{I} = (\blacktriangle\,{}_{I}\lrcorner)\,{}_{I}\eta^{I}$$

$$\ast\,\lrcorner^{I} = \lrcorner^{N\llcorner I}\,\overline{-1}^{\,I > N\llcorner I}\,{}_{I}\eta^{I}$$

$$,\blacktriangleleft = ,\lrcorner\;\underbrace{\lrcorner',\blacktriangleleft}: \quad {}_{M}\lrcorner\,\lrcorner^{N} = \det\left({}_{\mu}\lrcorner\,\lrcorner^{\nu}\right) = \det\,{}_{\mu}\delta^{\nu} = {}_{M}\delta^{N}$$

$$,\blacktriangleright = ,\lrcorner\;\underbrace{\lrcorner',\blacktriangleright}: \quad \overset{*}{\lrcorner}^{I}\,\lrcorner^{J} = \det\,\overset{*}{\lrcorner}^{i}\,\lrcorner^{j} = \det\,{}_{i}\delta^{j} = {}_{I}\delta^{J} = {}_{I}\lrcorner\,\lrcorner^{J}$$

$$\overset{*}{\lrcorner}^{I} = {}_{I}\lrcorner$$



$$\overset{*}{\lrcorner}^{I}\,\underset{\mathfrak{h}}{\bigstar}\,\lrcorner^{J} = \begin{cases} \overset{*}{\lrcorner}^{I}\,\mathfrak{h}\,\lrcorner^{J} & = \mathfrak{h}^{IJ} \\ \overset{*}{\lrcorner}^{I}\,\mathbb{b}\,\lrcorner^{J} & = {}_{I}\lrcorner\,\mathbb{b}\,\lrcorner^{J} = \det\,\lrcorner^{i}\underset{\mathfrak{h}}{\bigstar}\lrcorner^{j} = \det\,{}_{I}\mathbb{b}^{J} = {}_{I}\mathbb{b}^{J} \end{cases}$$

$$\overset{z}{\blacktriangle}\,{}_{J}\lrcorner = \sum_{|I| = |J|} \lrcorner^{I}\,{}^{z}_{I}\mathbb{1}^{J}$$

$$\lrcorner^{J} = \sum_{|I|=|J|} \left(\overset{z}{\bowtie}\, {}_{I}\lrcorner \right) {}_{I}\flat^{J}_{z}$$

$${}_{M}\lrcorner \sum_{I} \lrcorner^{I} \;\; {}_{I}\overset{z}{\lrcorner}^{J} = \sum_{I} {}_{M}\delta^{I} \; {}_{I}\overset{z}{\lrcorner}^{J} = {}_{M}\overset{z}{\lrcorner}^{J} = {}_{M}\lrcorner \; \overset{z}{\bowtie} \; {}_{J}\lrcorner$$

$${}_{M}\lrcorner\, \lrcorner^{J} = {}_{M}\delta^{J} = \det {}_{M}\left(\flat_{z}\,{}^{z}\lrcorner\right)^{J} = \sum_{|I|=|J|} {}_{M}\flat_{z}^{I} \; {}^{z}_{I}\lrcorner^{J} = \sum_{I} \left({}_{M}\lrcorner \bowtie {}_{I}\lrcorner \right) {}^{z}_{I}\lrcorner^{J}$$

$$\overset{z}{\bowtie}\; {}_{I}\flat = \lrcorner^{I} \; {}_{I}\eta^{I}$$

$$\bowtie \lrcorner^{I} = \left({}_{I}\flat \right) {}_{I}\eta^{I}$$

$$\overline{\mathbb{C}}^{\mathbb{N}} \ni \begin{cases} \urcorner^{J} & = \urcorner_{9}\lrcorner \\ \lrcorner^{J} & = \bigwedge_{j \in J} \lrcorner^{j} = \lrcorner\,\lrcorner^{J} \end{cases} \text{ dual ONBasis}$$

$$\begin{cases} \urcorner & = \urcorner^{I}\, {}_{I}\lrcorner \\ \lrcorner & = \lrcorner^{I}\, {}_{I}\lrcorner \end{cases}$$

$$\begin{cases} \urcorner^{I} \bowtie \urcorner^{J} = \overset{*}{\urcorner}^{I} \urcorner\urcorner^{J} = \overset{*}{\urcorner}^{I} \underbrace{\overset{-*}{\urcorner}{}^{-1}\eta\,\overset{-1}{\urcorner}}\urcorner^{J} = \underbrace{\urcorner^{I}\overset{*}{\overline{\urcorner}}{}^{-1}}\,\eta^{-1}\underbrace{\urcorner^{J}\,\overline{\urcorner}^{-1}} & = \underbrace{\urcorner\overset{*}{\lrcorner}^{I}} \ldots \\ \lrcorner^{I} \bowtie \lrcorner^{J} = \det \overset{*}{\lrcorner}^{i} \left(\overset{*}{\flat}\eta\flat\right) \lrcorner^{j} = \det\left(\flat\overset{*}{\lrcorner}^{i}\right)\eta\left(\flat\lrcorner^{j}\right) = \det {}_{i}\overset{*}{\lrcorner}\eta\lrcorner^{j} = \overset{*}{\lrcorner}^{I}\flat\lrcorner^{J} = \overset{*}{\lrcorner}^{I}\underbrace{\overset{*}{\flat}\eta^{-1}\flat}\lrcorner^{J} = \underbrace{\flat\overset{*}{\lrcorner}^{I}}\,\eta^{-1}\underbrace{\flat\lrcorner^{J}} & = \underbrace{\lrcorner\overset{*}{\lrcorner}^{I}} \ldots \end{cases}$$

$$\underset{z}{\ast}\, \lrcorner^{I} = \lrcorner^{N \llcorner I} \; \overline{-1}^{\,I > N \llcorner I} \; {}_{I}\eta^{I}$$

$$\underset{z}{\ast}\, \lrcorner^{J} = \sum_{|I|=|J|} \lrcorner^{N \llcorner I} \; \overline{-1}^{\,I > N \llcorner I} \; {}_{I}\flat^{J}_{z} \left({}_{N}\eta^{N} / {}_{N}\flat^{N}_{z} \right)^{1/2}$$

$$\lrcorner^{N} = c\; \lrcorner^{N}$$

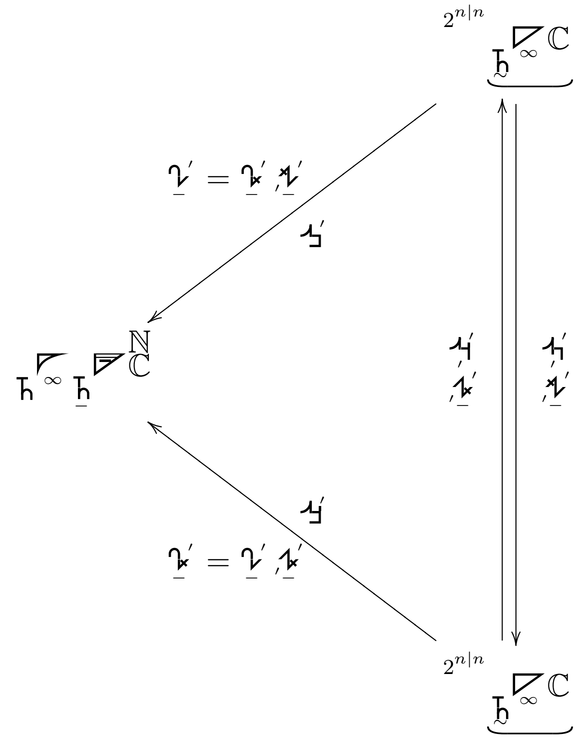
$${}_{N}\eta^{N} = \lrcorner^{N} \underset{z}{\bowtie} \lrcorner^{N} = c^{2}\; \lrcorner^{N} \underset{z}{\bowtie} \lrcorner^{N} = c^{2}\; {}_{N}\flat^{N}_{z} \implies \text{LHS} = \sum_{I} \underbrace{{}_{I}\lrcorner \vDash \lrcorner^{N}}\, {}_{I}\flat^{J}_{z} = \sum_{I} {}_{I}\lrcorner \vDash \lrcorner^{N} \left({}_{N}\eta^{N} / {}_{N}\flat^{N}_{z} \right)^{1/2} {}_{I}\flat^{J}_{z} = \text{RH}\ldots$$

$${}_{,}\urcorner = \begin{cases} \overset{-1}{\urcorner}_{,}\underbrace{\urcorner'{}_{,}\urcorner} \\ {}_{,}\flat\,\underbrace{\lrcorner'{}_{,}\urcorner} \end{cases} \qquad {}_{I}\delta^{J} = \begin{cases} \overset{-1}{\urcorner}_{I}\urcorner^{J} \\ {}_{I}\flat\lrcorner^{J} \end{cases}$$

$${}_{,}\lrcorner = \begin{cases} \urcorner_{,}\underbrace{\overset{-1}{\urcorner}{}'{}_{,}\lrcorner} \\ {}_{,}\lrcorner\,\underbrace{\flat'{}_{,}\lrcorner} \end{cases} \qquad {}_{M}\delta^{N} = \begin{cases} {}_{M}\urcorner\overset{-1}{\urcorner}{}^{N} \\ {}_{M}\lrcorner\flat^{N} \end{cases}$$

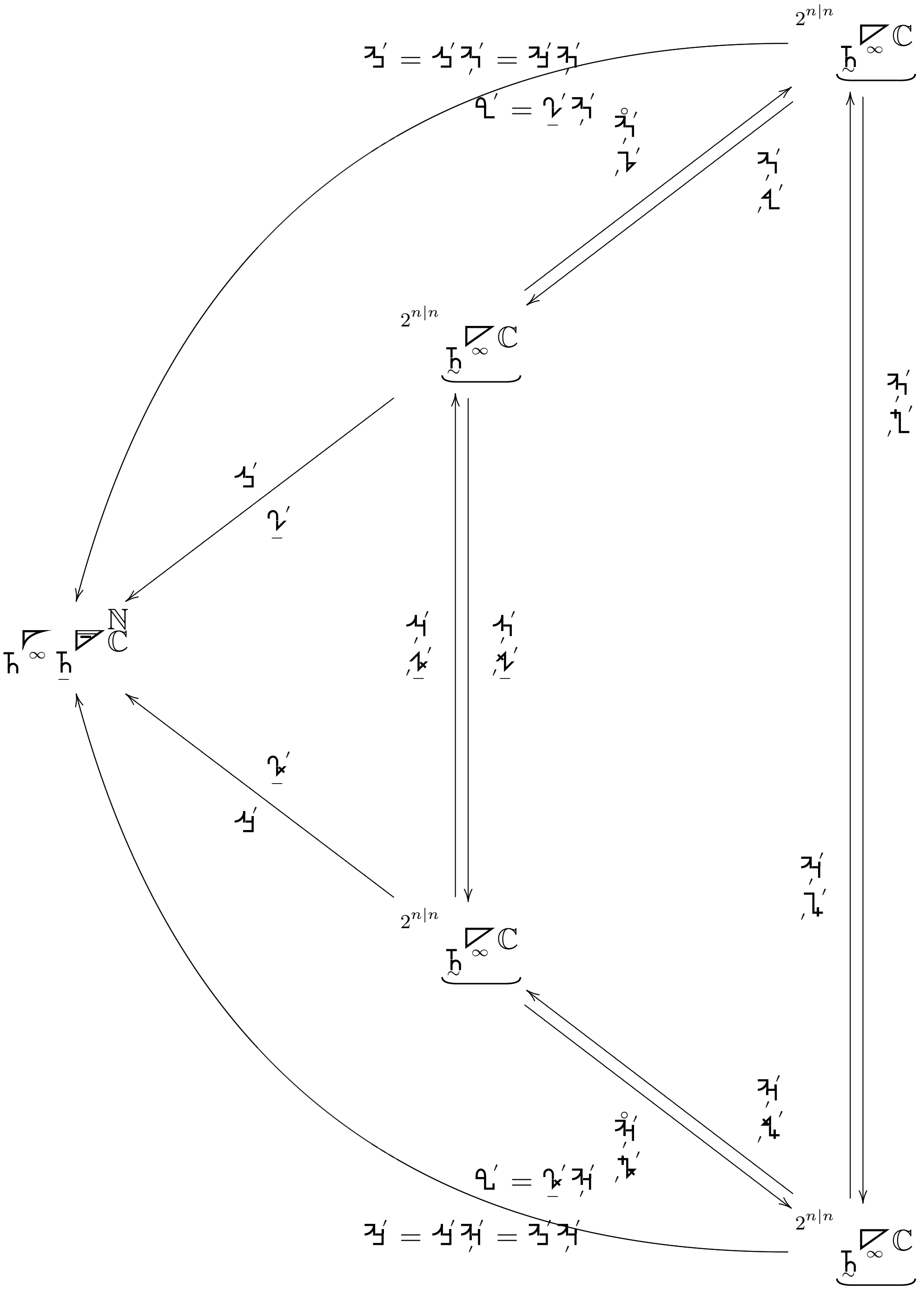
$$\lrcorner' \;\; {}_{,}\urcorner = \begin{cases} \overset{-1}{\urcorner}\underbrace{\urcorner'{}_{,}\urcorner} & = \overset{-1}{\urcorner}{}'\,\underbrace{\urcorner'{}_{,}\urcorner} \\ \flat\,\underbrace{\lrcorner'{}_{,}\urcorner} & = \flat'\,\underbrace{{}_{,}\lrcorner'{}_{,}\urcorner} \end{cases} : \qquad \lrcorner^{J} = \begin{cases} \overset{-1}{\urcorner}\urcorner^{J} & = \overset{-1}{\urcorner}{}^{L}\,{}_{L}\urcorner^{J} \\ \flat\lrcorner^{J} & = \flat^{L}\,{}_{L}\lrcorner^{J} \end{cases}$$

[illegible]



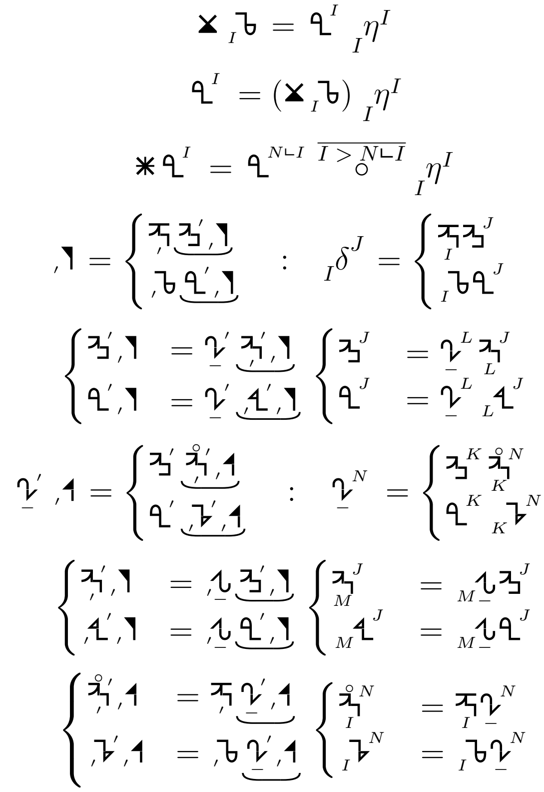
$\mathbb{C}^{\mathbb{N}} \ni$ holonomic basis

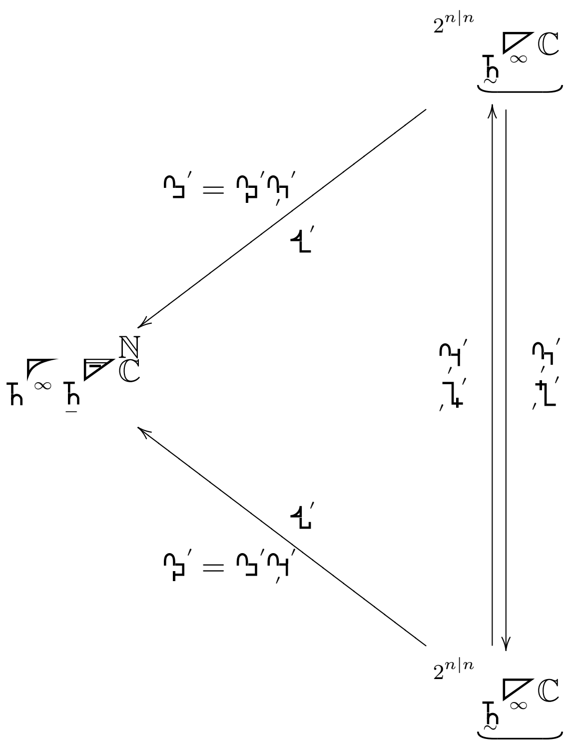
$= \;:\quad {}_M\delta^N =$



$$[\text{illegible}]^{\mathbb{N}}_{\mathbb{C}} \ni \begin{cases} [\text{illegible}]^{J} & * \\ [\text{illegible}]^{J} & = {}_{j \in J} [\text{illegible}]^{j} \end{cases} \quad \text{dual ONbasis}$$

$$[\text{illegible}]^{I} \, [\text{illegible}] \, [\text{illegible}]^{J} = {}_{I}\eta^{J}$$





$2^{n|n}$
ℂ
ℕ
ℂ
$2^{n|n}$
ℂ