

$$\begin{cases} {}^n\mathbb{R}_n^U = {}^n\mathbb{R}_n^C \cap {}^n\mathbb{C}_n^C \\ {}^n\mathbb{C}_n^U = {}^n\mathbb{C}_n^C \cap {}^n\mathbb{H}_n^C \end{cases} \xrightarrow{i} \begin{cases} {}^n\mathbb{C}_n^C \\ {}^n\mathbb{H}_n^C \end{cases}$$

$$\Gamma \in {}^n\mathbb{R}_n^U \Rightarrow \Gamma \overset{t}{\Gamma} = \Gamma \overset{*}{\Gamma} = 1$$

$$\Gamma \in {}^n\mathbb{C}_n^U \Rightarrow \Gamma i \overset{*}{\Gamma} = i \Gamma \overset{*}{\Gamma} = i$$

$$\begin{cases} {}_2\mathbb{R}_n^U = {}_2\mathbb{R}_n^C \cap {}_2\mathbb{C}_n^C \\ {}_2\mathbb{C}_n^U = {}_2\mathbb{C}_n^C \cap {}_2\mathbb{H}_n^C \end{cases} \xrightarrow{\begin{array}{c|c} \mathbf{1} & 0 \\ \hline 0 & \mathbf{1} \\ \hline i & 0 \\ \hline 0 & i \end{array}} \begin{cases} {}_2\mathbb{C}_n^C \\ {}_2\mathbb{H}_n^C \end{cases}$$

$$\Gamma \in {}_2\mathbb{R}_n^U \Rightarrow \Gamma \overset{T}{\Gamma} = \Gamma \overset{*}{\Gamma} = \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right.$$

$$\Gamma \in {}_2\mathbb{C}_n^U \Rightarrow \Gamma \overset{*}{\Gamma} = \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right. \Rightarrow \Gamma \frac{i}{0} \left| \begin{array}{c} 0 \\ i \end{array} \right. \overset{*}{\Gamma} = \frac{i}{0} \left| \begin{array}{c} 0 \\ i \end{array} \right. \Gamma \overset{*}{\Gamma} = \frac{i}{0} \left| \begin{array}{c} 0 \\ i \end{array} \right. \Rightarrow \Gamma \in {}_2\mathbb{H}_n^C$$

$$\sigma \in \mathbb{C}^U \Rightarrow \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \overset{n}{\mathbb{C}}_n \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. \xrightarrow{\text{unit}} \frac{0}{-\bar{\tau}} \left| \begin{array}{c|c} \pm & \\ \hline 0 & 0 \end{array} \right. \overset{*}{\xrightarrow{n}} \overset{n}{\mathbb{H}}_n$$

$$\begin{aligned}
& \Gamma \in {}^n \mathbb{C}_n^U \Rightarrow \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \underset{\mathbb{R}}{\Gamma} \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. \frac{i}{0} \left| \begin{array}{c|c} 0 & \\ \hline -i & \end{array} \right. \overset{*}{\underset{\mathbb{R}}{\Gamma}} \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \underset{\mathbb{R}}{\Gamma} \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. \\
& = \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \underset{\mathbb{R}}{\Gamma} \underbrace{\frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. \frac{i}{0} \left| \begin{array}{c|c} 0 & \\ \hline -i & \end{array} \right.}_{\frac{0}{\kappa} \left| \begin{array}{c|c} -\kappa & \\ \hline 0 & 0 \end{array} \right.} \underset{\mathbb{R}}{\Gamma} \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \underset{\mathbb{R}}{\Gamma} \frac{0}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. \\
& = \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \frac{0}{\kappa} \left| \begin{array}{c|c} -\kappa & \\ \hline 0 & 0 \end{array} \right. \underset{\mathbb{R}}{\Gamma} \underset{\mathbb{R}}{\Gamma} \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. = \frac{\kappa\sigma i}{\tau} \left| \begin{array}{c|c} -\sigma & \\ \hline -\kappa\tau i & \end{array} \right. \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. = \frac{i}{0} \left| \begin{array}{c|c} 0 & \\ \hline -i & \end{array} \right. \\
& {}^n \mathbb{C}_n^U * \frac{\pm}{0} \left| \begin{array}{c|c} 0 & \\ \hline \pm & \end{array} \right. = 0 \Rightarrow \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. {}^n \mathbb{C}_n^U \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right. * \kappa i\sigma \tau \underset{\mathbb{R}}{\Gamma} \frac{0}{-\bar{\tau}} \left| \begin{array}{c|c} \pm & \\ \hline 0 & 0 \end{array} \right. = 0 \\
& = \frac{\kappa\sigma}{i\tau} \left| \begin{array}{c|c} i\sigma & \\ \hline \kappa\tau & \end{array} \right. \frac{\pm}{0} \left| \begin{array}{c|c} 0 & \\ \hline \pm & \end{array} \right. \frac{\kappa\bar{\sigma}}{-\bar{\sigma}i} \left| \begin{array}{c|c} -\bar{\tau}i & \\ \hline \kappa\bar{\tau} & \end{array} \right.
\end{aligned}$$