$$\begin{cases} {}^n\mathbb{C}^{\mho}_{\mathbb{R}n} = {}^n\mathbb{C}^{\mathsf{C}}_{\mathbb{R}n} \cap {}^n_2\mathbb{R}^{\Omega}_n \\ {}^n\mathbb{H}^{\mho}_{\mathbb{C}n} = {}^n\mathbb{H}^{\mathsf{C}}_{\mathbb{C}n} \cap {}^n_2\mathbb{C}^{\Omega}_n \end{cases} \quad \begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array} \atop \xrightarrow{} \begin{array}{c|c} 0 & \maltese \\ \hline -\maltese & 0 \end{array} \quad \begin{cases} {}^n_2\mathbb{R}^{\Omega}_n \\ {}^n_2\mathbb{C}^{\Omega}_n \end{cases}$$

$$\Gamma \in {}^n\mathbb{C}^{\mho}_n \implies \begin{cases} \Gamma_{\mathbb{R}}\, \overset{*}{\Gamma_{\mathbb{R}}} = 1 \\ \Gamma_{\mathbb{R}} \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{} = \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{}\, \Gamma_{\mathbb{R}} \end{cases} \implies \Gamma_{\mathbb{R}} \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{}\, \overset{*}{\Gamma_{\mathbb{R}}} = \Gamma_{\mathbb{R}}\, \overset{*}{\Gamma_{\mathbb{R}}} \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{} = \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{}$$

$$\Gamma \in {}^n\mathbb{H}^{\mho}_n \implies \begin{cases} \Gamma_{\mathbb{C}}\, \overset{*}{\Gamma_{\mathbb{C}}} = 1 \\ \Gamma_{\mathbb{C}} \dfrac{\begin{array}{c|c} 0 & \maltese \\ \hline -\maltese & 0 \end{array}}{} = \dfrac{\begin{array}{c|c} 0 & \maltese \\ \hline -\maltese & 0 \end{array}}{}\, \Gamma_{\mathbb{C}} \end{cases} \implies \Gamma_{\mathbb{C}} \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{}\, \overset{t}{\Gamma_{\mathbb{C}}} = \Gamma_{\mathbb{C}}\, \overset{*}{\Gamma_{\mathbb{C}}} \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{} = \dfrac{\begin{array}{c|c} 0 & 1 \\ \hline -1 & 0 \end{array}}{}$$