$$g_{\mathbb{R}} = \begin{array}{c|c} m & p \\ \hline q & n \end{array} \in {}^{r}_{2}\mathbb{R}^{\Omega}_{r}$$

$$z = x + iy = \overset{+}{z}$$

$$g_{\mathbb{R}}(z) = \underbrace{mz+p}_{}\overbrace{qz+n}^{-1} \in G_{\mathbb{R}}$$

$$\overset{+}{m} q = \overset{+}{q} m: \quad \overset{+}{p} n = \overset{+}{n} p: \quad \overset{+}{m} n - \overset{+}{q} p = 1 = \overset{+}{n} m - \overset{+}{p} q$$

$$\Rightarrow \underbrace{z\overset{+}{m} + \overset{+}{p}}_{}\overbrace{qz+n}^{} = z\overset{+}{m}qz + \overset{+}{p}n + z\overset{+}{m}n + \overset{+}{p}qz = z\overset{+}{q}mz + \overset{+}{n}p + z\overset{+}{q}p + \overset{+}{n}mz = \underbrace{z\overset{+}{q}+\overset{+}{n}}_{}\underbrace{mz+p}_{}$$

$$\Rightarrow \overbrace{g_{\mathbb{R}}(z)}^{+} = \underbrace{z\overset{+}{q}+\overset{+}{n}}_{-1}\underbrace{z\overset{+}{m}+\overset{+}{p}}_{} = \underbrace{mz+p}_{}\overbrace{qz+n}^{-1} = g_{\mathbb{R}}(z)$$

$$\gamma_{\mathbb{R}}(z) = \alpha z + \beta - z\gamma z - z\delta \in \mathfrak{g}_{\mathbb{R}}$$

$$\overbrace{\gamma_{\mathbb{R}}(z)}^{+} = z\overset{+}{\alpha} + \overset{+}{\beta} - z\overset{+}{\gamma}z - \overset{+}{\delta}z = \alpha z + \beta - z\gamma z - z\delta = \gamma_{\mathbb{R}}(z)$$

$$\gamma_{\mathbb{C}}(w) = \underbrace{\overbrace{\alpha+\delta}^{} + i\overbrace{\beta-\gamma}^{}}_{}w + \underbrace{\overbrace{\alpha-\delta}^{} - i\overbrace{\beta+\gamma}^{}}_{} - w\overbrace{\underbrace{\alpha-\delta}_{} + i\underbrace{\beta+\gamma}_{}}^{} - \overbrace{\underbrace{\alpha+\delta}_{} + i\underbrace{\gamma-\beta}_{}}^{}w$$