

$${}^{p|q}\mathbb{C}_{r|s}\triangleleft_{\omega}\mathbb{C} = \left[\begin{array}{ccc|ccc} {}^1|_1\lrcorner_1 & \cdots & {}^r|_1\lrcorner_1 & | & {}^1|_1\lrcorner_1 & \cdots & {}^s|_1\lrcorner_1 \\ \vdots & \ddots & \vdots & & \vdots & \ddots & \vdots \\ {}^1|_p\lrcorner_p & \cdots & {}^r|_p\lrcorner_p & | & {}^1|_p\lrcorner_p & \cdots & {}^s|_p\lrcorner_p \\ \hline {}^1|_1\lrcorner_1 & \cdots & {}^r|_1\lrcorner_1 & | & {}^1|_1\lrcorner_1 & \cdots & {}^s|_1\lrcorner_1 \\ \vdots & \ddots & \vdots & & \vdots & \ddots & \vdots \\ {}^1|_q\lrcorner_q & \cdots & {}^r|_q\lrcorner_q & | & {}^1|_q\lrcorner_q & \cdots & {}^s|_q\lrcorner_q \\ \hline & & & \text{ev} & & & \text{odd} \\ & & & \text{odd} & & & \text{ev} \end{array} \right] = \left[\begin{array}{c} \lrcorner \\ \lrcorner \end{array} \right]$$

$${}^{p|q}\mathbb{C}_{r|s}\triangleleft_{\omega}\mathbb{C} \xrightarrow{\mu} \underbrace{{}^{p|q}\mathbb{C}_{k|\ell}\triangleleft_{\omega}\mathbb{C}}_{\mathbf{x}} \underbrace{{}^{k|\ell}\mathbb{C}_{r|s}\triangleleft_{\omega}\mathbb{C}}$$

$$\mu^i \lrcorner_{k|} = \sum_{j|} {}^i \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k|} + \sum_{j|} {}^{|i|} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{k|}$$

$$\mu^i \lrcorner_{|k} = \sum_{j|} {}^i \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k|} + \sum_{j|} {}^{|i|} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k}$$

$$\mu^{|i} \lrcorner_{k|} = \sum_{j|} {}^{|i} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k|} + \sum_{j|} {}^{|i|} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{k|}$$

$$\mu^{|i} \lrcorner_{|k} = \sum_{j|} {}^{|i} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k|} + \sum_{j|} {}^{|i|} \lrcorner_{j|} \mathbf{x}^{j|} \lrcorner_{|k}$$

$${}^{1|1}\mathbb{C}^{1|1}\triangleleft_{\omega}\mathbb{C} = \left[\begin{array}{c|c} \lrcorner : \lrcorner : \lrcorner : \lrcorner \\ \hline \lrcorner | \lrcorner \\ \lrcorner | \lrcorner \\ \hline \text{ev} & \text{odd} \\ \text{odd} & \text{ev} \end{array} \right] \mathbb{C} = \left[\begin{array}{c|c} a:\beta:\gamma:d \\ \hline a | \beta \\ \gamma | d \\ \hline \text{ev} & \text{odd} \\ \text{odd} & \text{ev} \end{array} \text{ standard relations} \right] \mathbb{C}$$

$${}^{p|q}\mathbb{C}^{p|q}\triangleleft_{\omega}\mathbb{C} = \left[\begin{array}{c|c} \lrcorner^j : \lrcorner^n : \lrcorner^j : \lrcorner^n : i \in p \ni j:m \in q \ni n \\ \hline \lrcorner | \lrcorner \\ \lrcorner | \lrcorner \\ \hline \text{ev} & \text{odd} \\ \text{odd} & \text{ev} \end{array} \right] \mathbb{C} = \left[\begin{array}{c|c} \lrcorner^j : \lrcorner^n : \lrcorner^j : \lrcorner^n : i \in p \ni j:m \in q \ni n \\ \hline a | \beta \\ \gamma | d \\ \hline \text{ev} & \text{odd} \\ \text{odd} & \text{ev} \end{array} \text{ standard relations} \right] \mathbb{C}$$

$${}^{r:s|q}\mathbb{C}^{r:s|q}\triangleleft_{\omega}\mathbb{C} = \left[\begin{array}{ccc|ccc} \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m & | & \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m \\ \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m & | & \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m \\ \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m & | & \lrcorner^j_i \lrcorner^k_i \lrcorner^n_i & \lrcorner^j_\ell \lrcorner^k_\ell \lrcorner^n_\ell & \lrcorner^m_m \lrcorner^j_m \lrcorner^k_m \lrcorner^n_m \\ \hline & & & \text{ev} & & & \text{odd} \\ & & & \text{odd} & & & \text{ev} \end{array} \right]$$

$${}^{p|q}\mathbb{C}_{p|q}\triangleleft_{\omega}\mathbb{C} = \mathbb{C} \left\{ \begin{array}{c|c} a & \beta \\ \hline \gamma & d \\ \hline \text{ev} & \text{odd} \\ \text{odd} & \text{ev} \end{array} \right\}$$

$${}^{p|q}\mathbb{C}_{p|q\Delta_\omega\mathbb{C}} \times {}^{p|q}\mathbb{C}_{p|q\Delta_\omega\mathbb{C}} \xleftarrow[\text{hom}]{\Delta} {}^{p|q}\mathbb{C}_{p|q\Delta_\omega\mathbb{C}}$$

$$\Delta \frac{\begin{array}{c|c} a & \beta \\ \hline \gamma & d \end{array}}{\begin{array}{c|c} \gamma & d \end{array}} = \frac{\begin{array}{c|c} a & \beta \\ \hline \gamma & d \end{array}}{\begin{array}{c|c} \gamma & d \end{array}} \times \frac{\begin{array}{c|c} a & \beta \\ \hline \gamma & d \end{array}}{\begin{array}{c|c} \gamma & d \end{array}} = \frac{\begin{array}{c|c} a \cdot \mathbf{x} \cdot a + \beta \cdot \mathbf{x} \cdot \gamma & a \cdot \mathbf{x} \cdot \beta + \beta \cdot \mathbf{x} \cdot d \\ \hline \gamma \cdot \mathbf{x} \cdot a + d \cdot \mathbf{x} \cdot \gamma & \gamma \cdot \mathbf{x} \cdot \beta + d \cdot \mathbf{x} \cdot d \end{array}}{\begin{array}{c|c} \gamma \cdot \mathbf{x} \cdot a + d \cdot \mathbf{x} \cdot \gamma & \gamma \cdot \mathbf{x} \cdot \beta + d \cdot \mathbf{x} \cdot d \end{array}}$$

$$\Delta \underline{\beta\gamma + \gamma\beta} = \Delta\beta\Delta\gamma + \Delta\gamma\Delta\beta = \underbrace{\begin{array}{c|c} a \cdot \mathbf{x} \cdot \beta + \beta \cdot \mathbf{x} \cdot d \\ \hline \gamma \cdot \mathbf{x} \cdot a + d \cdot \mathbf{x} \cdot \gamma \end{array}} + \underbrace{\begin{array}{c|c} \gamma \cdot \mathbf{x} \cdot a + d \cdot \mathbf{x} \cdot \gamma \\ \hline a \cdot \mathbf{x} \cdot \beta + \beta \cdot \mathbf{x} \cdot d \end{array}}$$

$$= -a \cdot \gamma \cdot \mathbf{x} \cdot \beta \cdot a + a \cdot d \cdot \mathbf{x} \cdot \beta \cdot \gamma + \beta \cdot \gamma \cdot \mathbf{x} \cdot d \cdot a + \beta \cdot d \cdot \mathbf{x} \cdot d \cdot \gamma + \gamma \cdot a \cdot \mathbf{x} \cdot a \cdot \beta + \gamma \cdot \beta \cdot \mathbf{x} \cdot a \cdot d + d \cdot a \cdot \mathbf{x} \cdot \gamma \cdot \beta - d \cdot \beta \cdot \mathbf{x} \cdot \gamma \cdot d$$

$$= \gamma \cdot a \cdot \mathbf{x} \cdot a \cdot \beta - a \cdot \gamma \cdot \mathbf{x} \cdot \beta \cdot a + a \cdot d \cdot \mathbf{x} \cdot \beta \cdot \gamma + d \cdot a \cdot \mathbf{x} \cdot \gamma \cdot \beta + \beta \cdot \gamma \cdot \mathbf{x} \cdot d \cdot a + \gamma \cdot \beta \cdot \mathbf{x} \cdot a \cdot d + \beta \cdot d \cdot \mathbf{x} \cdot d \cdot \gamma - d \cdot \beta \cdot \mathbf{x} \cdot \gamma \cdot d$$

$$= \underbrace{\gamma \cdot a - a \cdot \gamma \cdot \mathbf{x} \cdot a \cdot \beta + a \cdot \gamma \cdot \mathbf{x} \cdot a \cdot \beta - \beta \cdot a}_{\in \mathcal{J}\mathbf{x}\mathcal{F} + \mathcal{F}\mathbf{x}\mathcal{J}} + \underbrace{a \cdot d - d \cdot a \cdot \mathbf{x} \cdot \beta \cdot \gamma + d \cdot a \cdot \mathbf{x} \cdot \beta \cdot \gamma + \gamma \cdot \beta}_{\in \mathcal{J}\mathbf{x}\mathcal{F} + \mathcal{F}\mathbf{x}\mathcal{J}}$$

$$+ \underbrace{\beta \cdot \gamma + \gamma \cdot \beta \cdot \mathbf{x} \cdot d \cdot a + \gamma \cdot \beta \cdot \mathbf{x} \cdot a \cdot d - d \cdot a}_{\in \mathcal{J}\mathbf{x}\mathcal{F} + \mathcal{F}\mathbf{x}\mathcal{J}} + \underbrace{\beta \cdot d - d \cdot \beta \cdot \mathbf{x} \cdot d \cdot \gamma + d \cdot \beta \cdot \mathbf{x} \cdot d \cdot \gamma - \gamma \cdot d}_{\in \mathcal{J}\mathbf{x}\mathcal{F} + \mathcal{F}\mathbf{x}\mathcal{J}} \in \mathcal{J}\mathbf{x}\mathcal{F} + \mathcal{F}\mathbf{x}\mathcal{J}$$