

$$\frac{\begin{array}{c|c} \Gamma & \Upsilon \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\begin{array}{c|c} \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}} = \frac{\begin{array}{c|c} {}^i\Gamma_m & {}^i\Upsilon_n \\ \hline j\sqrt{\phantom{x}}_m & j\sqrt{\phantom{x}}_n \end{array}}{j\sqrt{\phantom{x}}_m | j\sqrt{\phantom{x}}_n} \in {}_{IJ}\mathbb{1}_{MN}$$

$${}^i\Gamma_m \in \mathbb{1}_\varepsilon \ni {}^j\Upsilon_n$$

$${}^i\Upsilon_n \in \mathbb{1}_{-\varepsilon} \ni {}^j\Gamma_m$$

$$\frac{\begin{array}{c|c} \Gamma & \Upsilon \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\begin{array}{c|c} \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}} \frac{\begin{array}{c|c} \mathcal{F} & \mathcal{H} \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\begin{array}{c|c} \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}} = \frac{\begin{array}{c|c} \Gamma\mathcal{F} + \Upsilon\mathcal{H} & \Gamma\mathcal{H} + \Upsilon\mathcal{F} \\ \hline \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} & \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} | \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}}} \text{sAlg}$$

$$\Gamma * \mathcal{F} \stackrel{\text{sup}}{\text{Comm}} \Gamma\mathcal{F} - \frac{|\Gamma||\mathcal{F}|}{-1} \mathcal{F}\Gamma$$

$$\begin{aligned} \frac{\begin{array}{c|c} \frac{\Gamma}{1-p} & \frac{\Upsilon}{1-p} \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\frac{\sqrt{\phantom{x}}}{1-p} | \frac{\sqrt{\phantom{x}}}{1-p}} * \frac{\begin{array}{c|c} \frac{\mathcal{F}}{1-q} & \frac{\mathcal{H}}{1-q} \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\frac{\sqrt{\phantom{x}}}{1-q} | \frac{\sqrt{\phantom{x}}}{1-q}} &= \frac{\begin{array}{c|c} \Gamma & \Upsilon \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} \frac{\begin{array}{c|c} \mathcal{F} & \mathcal{H} \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} - \frac{pq}{-1} \frac{\begin{array}{c|c} \mathcal{F} & \mathcal{H} \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} \frac{\begin{array}{c|c} \Gamma & \Upsilon \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} \\ &= \frac{\begin{array}{c|c} \Gamma\mathcal{F} + \Upsilon\mathcal{H} & \Gamma\mathcal{H} + \Upsilon\mathcal{F} \\ \hline \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} & \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} | \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}}} - \frac{pq}{-1} \frac{\begin{array}{c|c} \mathcal{F}\Gamma + \mathcal{H}\Upsilon & \mathcal{F}\Upsilon + \mathcal{H}\Gamma \\ \hline \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} & \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} | \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}}} \\ &= \frac{\begin{array}{c|c} \Gamma\mathcal{F} + \Upsilon\mathcal{H} - \frac{pq}{-1}\mathcal{F}\Gamma - \frac{pq}{-1}\mathcal{H}\Upsilon & \Gamma\mathcal{H} + \Upsilon\mathcal{F} - \frac{pq}{-1}\mathcal{F}\Upsilon - \frac{pq}{-1}\mathcal{H}\Gamma \\ \hline \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} & \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} | \sqrt{\phantom{x}}\sqrt{\phantom{x}} + \sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}} - \frac{pq}{-1}\sqrt{\phantom{x}}\sqrt{\phantom{x}}} \end{aligned}$$

$$\frac{\begin{array}{c|c} \Gamma^T & \Upsilon \\ \hline \sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} = \frac{\begin{array}{c|c} \mathbb{1} & \varepsilon\sqrt{\phantom{x}} \\ \hline -\varepsilon\sqrt{\phantom{x}} & \sqrt{\phantom{x}} \end{array}}{\sqrt{\phantom{x}} | \sqrt{\phantom{x}}} \frac{\begin{array}{c|c} {}^i\Gamma_m^T & {}^i\Upsilon_n \\ \hline j\sqrt{\phantom{x}}_m & j\sqrt{\phantom{x}}_n \end{array}}{j\sqrt{\phantom{x}}_m | j\sqrt{\phantom{x}}_n} = \frac{\begin{array}{c|c} {}^m\Gamma_i & \varepsilon^m\sqrt{\phantom{x}}_j \\ \hline -\varepsilon^m\sqrt{\phantom{x}}_i & \sqrt{\phantom{x}}_j \end{array}}{-\varepsilon^m\sqrt{\phantom{x}}_i | \sqrt{\phantom{x}}_j}$$



$$\text{ev } \frac{i \int_m \mid i \int_n}{j \int_m \mid j \int_n} = \sum_i i \int_i - \sum_j j \int_j \in \mathbb{1}_0$$

$$\text{odd } \frac{i \int_m \mid i \int_n}{j \int_m \mid j \int_n} = \sum_i i \int_i + \sum_j j \int_j \in \mathbb{1}_1$$

$$\int * \int = 0$$

$$\int_p \int_q = i \int_j \int_i = \frac{pq}{1} \int_i \int_j = \frac{pq}{1} \int_i \int_j$$

$$\frac{\int_p \mid \int_{1-p}}{\int_{1-p} \mid \int_p} * \frac{\int_q \mid \int_{1-q}}{\int_{1-q} \mid \int_q} = \frac{\int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int \mid \int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int}{\int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int \mid \int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int}$$

$$= \frac{\int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int}{1} - \frac{p+q}{1} \frac{\int \int + \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int}{1}$$

$$= \frac{pq}{1} \int \int + \frac{(1-p)(1-q)}{1} \int \int - \frac{pq}{1} \int \int - \frac{pq}{1} \int \int - \frac{p+q}{1} \frac{(1-p)(1-q)}{1} \int \int - \frac{pq}{1} \int \int + \frac{pq}{1} \int \int + \frac{pq}{1} \int \int$$

$$= \frac{pq}{1} - \frac{pq}{1} \int \int + \frac{(1-p)(1-q)}{1} + \frac{p+qpq}{1} \int \int - \frac{pq}{1} + \frac{p+q(1-p)(1-q)}{1} \int \int + \frac{p+qpq}{1} - \frac{p+qpq}{1} \int \int = 0$$