

$$\begin{aligned}
\text{lhs} &= \int (\mathcal{L} / @ (X_{i,j} [1] X_{i+1,k} [1] X_{j+1,k+1} [1])) \\
&\quad \mathbb{d} \{ \mathbf{x}_i, \mathbf{x}_j, \mathbf{x}_k, \mathbf{p}_{i+1}, \mathbf{p}_{j+1}, \mathbf{p}_{k+1}, \mathbf{x}_{i+1}, \mathbf{x}_{j+1}, \mathbf{x}_{k+1} \} ; \\
\text{rhs} &= \int (\mathcal{L} / @ (X_{j,k} [1] X_{i,k+1} [1] X_{i+1,j+1} [1])) \\
&\quad \mathbb{d} \{ \mathbf{x}_i, \mathbf{x}_j, \mathbf{x}_k, \mathbf{x}_{i+1}, \mathbf{p}_{i+1}, \mathbf{p}_{j+1}, \mathbf{p}_{k+1}, \mathbf{x}_{j+1}, \mathbf{x}_{k+1} \} ; \\
\text{lhs} &=== \text{rhs}
\end{aligned}$$