

$$\begin{aligned}
\text{Tr}_{\mathbf{A}, \mathbf{B}}^{\mathbf{C}}(\mathbf{f}_1)(a^*, b) &= \bigvee_{c \in \mathbf{C}} \mathbf{f}_1(\langle c, a \rangle^*, \langle c, b \rangle) \\
&\leq_{\mathbf{DP}} \bigvee_{c \in \mathbf{C}} \mathbf{f}_2(\langle c, a \rangle^*, \langle c, b \rangle) \\
&= \text{Tr}_{\mathbf{A}, \mathbf{B}}^{\mathbf{C}}(\mathbf{f}_2)(a^*, b).
\end{aligned}$$