

$$\begin{aligned}
(((\mathbf{f} \circ \mathbf{g})) \circ \mathbf{h})(a^*, d) &= \bigvee_{c \in \mathbf{C}} \left(\bigvee_{b \in \mathbf{B}} \mathbf{f}(a^*, b) \wedge \mathbf{g}(b^*, c) \right) \wedge \mathbf{h}(c^*, d) \\
&= \bigvee_{c \in \mathbf{C}} \left(\bigvee_{b \in B} \mathbf{f}(a^*, b) \wedge \mathbf{g}(b^*, c) \wedge \mathbf{h}(c^*, d) \right) \\
&= \bigvee_{b \in \mathbf{B}} \mathbf{f}(a^*, b) \wedge \left(\bigvee_{c \in \mathbf{C}} \mathbf{g}(b^*, c) \wedge \mathbf{h}(c^*, d) \right) \\
&= (\mathbf{f} \circ (\mathbf{g} \circ \mathbf{h}))(a^*, d).
\end{aligned}$$