

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