$$(((\mathbf{d}_{9}^{\circ}\mathbf{e}))_{9}^{\circ}\mathbf{g})(p^{*},s) = \bigvee_{r \in \mathbb{R}} \left(\bigvee_{q \in \mathbb{Q}} \mathbf{d}(p^{*},q) \wedge \mathbf{e}(q^{*},r) \right) \wedge \mathbf{g}(r^{*},s)$$
$$= \bigvee_{r \in \mathbb{R}} \left(\bigvee_{q \in \mathbb{Q}} \mathbf{d}(p^{*},q) \wedge \mathbf{e}(q^{*},r) \wedge \mathbf{g}(r^{*},s) \right)$$

 $= (\mathbf{d} \circ (\mathbf{e} \circ \mathbf{g}))(p^*, \mathbf{s}).$

 $= \bigvee_{q \in \mathbf{Q}} \mathbf{d}(p^*, \mathbf{q}) \wedge \left(\bigvee_{r \in \mathbf{R}} \mathbf{e}(q^*, r) \wedge \mathbf{g}(r^*, \mathbf{s}) \right)$