$$(\mathbf{d}_{9}^{\circ}\mathbf{e}): \mathbf{P}^{\mathrm{op}} \times \mathbf{R} \to_{\mathbf{Pos}} \mathbf{Bool},$$

$$\langle p^{*}, r \rangle \mapsto \bigvee_{r \in \mathcal{O}} \mathbf{d}(p^{*}, q) \wedge \mathbf{e}(q^{*}, r).$$