Lemma. Let A be any set. Its powerset $\mathscr{P}A$, with the relation of inclusion, is a poset. View this poset as a category (this means there is a single morphism $S_1 \to S_2$ if and only if $S_1 \subseteq S_2$). For any two objects $S_1, S_2 \in \mathscr{P}A$, their categorical product exists and is given by $S_1 \cap S_2 \in \mathscr{P}A$.