Math 871 Problem Set 3 Replacement

(*) 15. Show that if $\mathcal{B}$ and $\mathcal{B}'$ are both bases for topologies on X, then the set

$$\mathcal{B}'' = \{B \cap B' : B \in \mathcal{B} \text{ and } B' \in \mathcal{B}'\}$$

is also a basis for a topology on X , and that the topology it generates is the coarsest topology on X containing both $\mathcal{B}$ and $\mathcal{B}'$.