

5. Show that if  $\mathcal{A}$  is a basis for a topology on  $X$ , then the topology generated by  $\mathcal{A}$  equals the intersection of all topologies on  $X$  that contain  $\mathcal{A}$ . Prove the same if  $\mathcal{A}$  is a subbasis.

(from Basis for a Topology)