

① Assume that  $A$  &  $B$  are compact subspaces of space  $X$ . Prove that  $A \cup B$  is also compact. HW13

↙ [Grad only.]  
② Prove that if  $\mathcal{C}$  is a chain of compact subspaces of a given space  $X$ , and, to avoid trivial cases,  $C \neq \emptyset$  and  $C \neq \emptyset$  for all  $C \in \mathcal{C}$ , then  $\bigcap \mathcal{D} \neq \emptyset$  where  $\mathcal{D} = \{\overline{C} \mid C \in \mathcal{C}\}$ .