

### Additional Problems Assignment 9

1. Let  $(X, \mathcal{T}_1)$  and  $(Y, \mathcal{T}_2)$  be topological spaces and  $f : X \rightarrow Y$  be a function. Show  $f$  is  $\mathcal{T}_1 - \mathcal{T}_2$  continuous if and only if for all  $F$  closed in  $\mathcal{T}_2$ ,  $f^{-1}(F)$  is closed in  $\mathcal{T}_1$ .