Additional Problems Assignment 10

1. Let $(X, \mathcal{T}_1)$ and $(Y, \mathcal{T}_2)$ be topological spaces with bases $\mathcal{B}_1$ and $\mathcal{B}_2$ respectively. Let $f : X \to Y$ be a function.
   (a) Show f is $\mathcal{T}_1 - \mathcal{T}_2$ continuous if and only if for all $V \in \mathcal{B}_2$, $f^{-1}(V)$ is open in $\mathcal{T}_1$.
   (b) Show by example that being that it is not the case that: f is $\mathcal{T}_1 - \mathcal{T}_2$ continuous if and only if for all $V \in \mathcal{B}_2$, $f^{-1}(V) \in \mathcal{B}_1$.