PHI 312 : pset 9

1. Let Y be a Hausdorff space, let X be an arbitrary topological space, and let $f, g : X \rightrightarrows Y$ be continuous functions. Show that if $f(x) = g(x)$ for all x in a dense subset E of X, then $f = g$.

2. Suppose that X and Y are compact Hausdorff spaces, and that $f : X \to Y$ is a continuous function. Show that if $f(X)$ is dense in Y, then $f(X) = Y$.

3. Suppose that X is a Stone space, and that $x, y \in X$. Show that if $x \neq y$ then there is a continuous function $f : X \to \{0, 1\}$ such that $f(x) \neq f(y)$. [Here $\{0, 1\}$ is assumed to have the discrete topology, i.e. all subsets are open.]