Homework #4 - Hand in no later than 2:41 p.m., Friday, May 26

Let $X$ be the plane and define pseudometrics $d$ and $\rho$ by

\[
d(x, y) = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2}, \text{ and} \\
\rho(x, y) = |x_1 - y_1|
\]

where, of course, $x = (x_1, x_2)$ and $y = (y_1, y_2)$. Let $i$ be the identity function on $X$; that is, $i(x) = x$ for every $x \in X$. Prove or disprove:

1. $i : (X, d) \to (X, \rho)$ is continuous.  
2. $i : (X, \rho) \to (X, d)$ is continuous.