Math 500 – Fall 2001

Homework # 3

1) Given a point x_0 in X show that the map $f : Y \to X \times Y$ given by $f(y) = (x_0, y)$ is continuous.

2) Show the subspace (a, b) of $\mathbf{R}$ is homeomorphic to $(0, 1)$.

3) Show the three metrics defined on $\mathbf{R}^n$ in class all generate the same topology.

4) Let d be a metric on X. Show $d : X \times X \to \mathbf{R}$ is continuous.

5) Let d be a metric on X. Define $d'(x, y) = \min\{d(x, y), 1\}$. Show d' is a metric and generates the same topology on X.