Math 423 Homework 1: additional problem

Let $(X_1, d_1), \ldots, (X_n, d_n)$ be metric spaces, and let X be the product space with the product metric:

$$d((x_1, \ldots, x_n), (y_1, \ldots, y_n)) = \max_{1 \leq j \leq n} d_j(x_j, y_j).$$

Show that the projection maps $\pi_j : X \to X_j$ are continuous.