

Name: _____

Score (Out of 8 points):

1. (8 points) Let X and Y be metric spaces, and then consider the product $X \times Y$ as a metric space with the product metric.

Consider a sequence of points $((x_n, y_n))_{n \in \mathbb{N}}$ in $X \times Y$. Show that this sequence converges if and only if $(x_n)_{n \in \mathbb{N}}$ converges in X , and $(y_n)_{n \in \mathbb{N}}$ converges in Y .