

Mathematics 595 (CAP/TRA) Fall 2005

Homework #4 (due Monday, September 26)

1. In class we discussed Hölder continuity: a map $f : (X, d) \rightarrow (Y, d')$ is α -Hölder continuous for some $0 < \alpha \leq 1$ if there exists a constant $C < \infty$ so that

$$d'(f(x), f(y)) \leq Cd(x, y)^\alpha. \quad (1)$$

What can you say about the class of maps $f : \mathbb{R} \rightarrow \mathbb{R}$ (usual Euclidean metric) which satisfy (1) for some $\alpha > 1$?

2. Show that the map $f : (0, 1) \rightarrow (0, \infty)$ given by $f(x) = \frac{1}{x}$ is not uniformly continuous.