

18.099b Problem Set 4b

Due: Thursday, March 11th (in class or before).

Let X be a set. Consider the map $d : X \times X \rightarrow \mathbb{R}$ given by $d(p, q) = 1$ if $p \neq q$ and $d(p, q) = 0$ if $p = q$. This defines a metric on X , called the *discrete metric*.

Write a short exposé on the discrete metric: defining it, proving that it is a metric, and describing (with proof) the open, closed and compact sets. You are free to organize the material in whatever way you think best. Think of it as a tiny mathematical essay; it should be self-contained and flow smoothly. The exposé must be typeset in Tex.