

Homework 2, Additional Problem.

(1) Let (X, d) be a metric space and let $A \subset X$ be a non-empty subset. Define

$$d(x, A) = \inf\{d(x, y) : y \in A\}.$$

- a. Prove $d(x, A) = 0$ if and only if $x \in \bar{A}$.
- b. Show that

$$|d(x, A) - d(y, A)| \leq d(x, y),$$

for all $x, y \in X$.