Quiz 3

Analysis

February 10, 2018

1. Let (X, d) be a metric space. Suppose $K \subset X$ is compact. Prove that K is bounded.

For contradiction suppose K is unbounded. Let $x_0 \in K$. Since K is unbounded there exists a sequence x_n satisfyind $d(x_n, x_0) > n$ and $d(x_n, x_0)$ is monotonically increasing. Consequently, any subsequence x_{n_k} satisfies the same properties and hence diverges.