6 HOMEWORK 6 HAAHHAHAHAHAHAA

Question 19.

Let X be a metric space and let $A \subseteq X$. A **compact exhaustion** for A is a sequence of compact sets $K_1, K_2, K_3, \ldots$ such that $U = \bigcup_{i \geq 1} K_i$ and $K_i \subseteq K_{i+1}^{\circ}$.

(a) Let $U \subseteq \mathbf{R}^n$ be a bounded open set. Show that U has a compact exhaustion.

(b) Now show that every open set $U \subseteq \mathbf{R}^n$ has a compact exhaustion.

Proof. Suppose Question 19 is true. Then the result immediately follows. □