

Take home exam: Due Mon. Apr. 21 - no delays admitted!

1. (15 pts) Pb. 1, page 162, textbook.

2. (35 pts) Pb. 2, page 177, textbook.

3. (15 pts) Let X be a metric space with metric d . Let K, V be subsets of X , K compact, V open, and assume that $K \subset V$. Show that there exists a continuous function $f : X \rightarrow \mathbf{R}$, with $f \equiv 1$ when restricted to K and $f \equiv 0$ on the complement of V . (*Hint*: Consider a function $d(x, A)$, choosing well your set A , and then modify this function to satisfy the required conditions.)

4. (35 pts) Pb. 7, page 181, textbook.