Homework 7

Due Monday, October 19 at 1:00pm

Instructions:

- To receive full credit, a solution must be clear, concise, and correct.
- Problems marked with * are *extra credit problems* and these are *optional*.
- If a problem asks a question with a "yes" or "no" answer, you must provide a proof of whatever answer you give.

(—) From the textbook: 25.2, 25.4, 26.5, 26.8, 27.1, 27.6, 28.1

(P1) * Give an example of a compact set $K \subset \mathbb{Q}$ that has infinitely many limit points. (That is, describe K, prove that K is compact, and then prove that infinitely many elements of K are limit points of K.)

(P2) * Let X be a compact metric space. Show that there is a countable subset $N \subset X$ that is *dense*, i.e. so that $X = \bar{N}$.