MA 717
M. Kon

PROBLEM SET 2
Due Thurs. 2/1/18

Lectures 2, 3

Note: Starred problems are optional.

1. Closed and open sets: Prove that in a metric space X, the set $\mathcal{O}$ is open iff $\sim \mathcal{O}$ is closed.

2. Continuity: Let (X,ρ) and (Y,d) be metric spaces. Let f: X $\rightarrow$ Y be a function. Prove that f is continuous if and only if for every open set $\mathcal{O} \subset$ Y, $f^{-1}(\mathcal{O})$ is open.

3. Lim sup and inf: Prove the second proposition on page 12, parts (a) to (d)

4. Reed and Simon, problem I.14

5*. Reed and Simon, problem I.15abc

6. Prove the Corollary to Theorem I.12.

7. Problem 18, Chapter I.