Math 445 – David Dumas – Spring 2019

Homework 2

Due Monday, February 4 in class (1:00pm)

The instructions from Homework 1 still apply. Make sure that you give a proof of every answer.

(—) From the textbook: 16.3, 16.8*, 17.3, 17.6**

* There are several cases to consider here, e.g. vertical lines, horizontal lines, lines of positive slope, and lines of negative slope. Make sure your answer covers all cases.

** Reminder: $\bigcup A_\alpha$ is Munkres' notation for an arbitrary union of sets (where the sets are called A_α, indexed by $\alpha \in J$ for some set J).

(P1) Let $A_+ = \left\{\frac{1}{n} \mid n \in \mathbb{N}\right\}$, and $A_- = \left\{-\frac{1}{n} \mid n \in \mathbb{N}\right\}$.

(a) Determine the closure of A_+ with respect to the standard topology.
(b) Determine the closure of A_- with respect to the standard topology.
(c) Determine the closure of A_+ with respect to the lower limit topology.
(d) Determine the closure of A_- with respect to the lower limit topology.