

Reading:

Munkres, §§15, 16*, 17(pp. 92–94), Handout #5.

*Skip the discussion of the order topology.

Weekly Report:

Due Monday, July 9.

Written Problems:

Due Wednesday, July 11.

1. Munkres, §16, #1, 3, 6.
2. Munkres, §17, #1, 2.
3. Let Y denote the following subset of \mathbb{R}^2 , with the subspace topology:

$$Y = \{(x, y) : x > 0, y \geq 0\}.$$

For each of the following subsets of Y , answer each of the following questions (no proofs necessary):

- (i) Is it open in Y ?
 - (ii) Is it open in \mathbb{R}^2 ?
 - (iii) Is it closed in Y ?
 - (iv) Is it closed in \mathbb{R}^2 ?
- (a) $A = \{(x, y) \in Y : y > 0\}$.
 - (b) $B = \{(x, y) \in Y : y = 0\}$.
 - (c) $C = \{(x, y) \in Y : x = 1\}$.
 - (d) $D = \{(x, y) \in Y : x^2 + y^2 \leq 1\}$.
 - (e) $E = \{(1/n, 0) : n \in \mathbb{Z}_+\}$.
 - (f) $F = \{(n, 0) : n \in \mathbb{Z}_+\}$.
 - (g) $G = \{(x, 0) : x \in \mathbb{R}, x > 0\}$.
 - (h) $H = \{(x, 0) : x \in \mathbb{R}, x \geq 1\}$.

First Portfolio Problem:

Due Friday, July 13.

Rewrite your solution to Problem 3.15 from Handout #3, with due attention to the conventions of mathematical proof-writing described in Handout #5. Pretend that you have been asked to write a solution key for the class, so your proof should be sufficiently clear, convincing, and well explained that everyone in the class can understand it. On Friday, July 13, bring two copies to class for peer review.