Math 301, Spring 2025 — Homework 6

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Due March 28 at 5:00 pm

Instructions. This problem set contains problems mostly from Week 7 of class. The problem numbers refer to our textbook, *Understanding Analysis* by Stephen Abbott.

Problem 1. Please do the following textbook problems: Exercises 3.2.2, 3.2.3abc, 3.2.4, 3.2.5, 3.2.6c, 3.2.8

Problem 2. For each of the following subsets of \mathbb{R} , state whether it is (1) open but not closed, (2) closed but not open, (3) both open and closed, or (4) neither open nor closed. No justification is needed.

- a. $\cup_{n=1}^{\infty} (0, 1+1/n)$
- b. $\bigcup_{n=1}^{\infty} [0, 1+1/n]$
- c. $\cap_{n=1}^{\infty}(0, 1+1/n)$
- d. $\cap_{n=1}^{\infty}[0, 1+1/n]$
- e. $\bigcup_{n=1}^{\infty} (n, n+1)$
- f. $\cup_{n=1}^{\infty} [n, n+1]$
- g. $\cap_{n=1}^{\infty}(n, n+1)$
- h. $\bigcap_{n=1}^{\infty} [n, n+1]$