Math 2080
Introduction to Analysis, Assignment 4
Due November 6th at the start of class.

All questions are from Gaughan, 5th ed. All questions are proof questions, this means you will be marked on the clarity and logical correctness of your explanations. Poor writing and sloppy/illegible presentation both impact the clarity of your work and so will be penalized: you must write all solutions legibly and in complete sentences that follow a logical train of thought.

Questions from Chapter 1: 32(b), 32(e), 41.

Questions from Chapter 2: 2, 9.

Remarks:

- In Question 36, the book uses the words"let E be the set of subsequential limits". By this they mean that given the bounded sequence $\{x_n\}_{n=1}^{\infty}$, the set E is defined as

$$E = \{L \in \mathbb{R} \mid \text{ there exists a subsequence } \{x_{n_k}\}_{k=1}^{\infty} \text{ of } \{x_n\}_{n=1}^{\infty} \text{ whose limit is } L\}.$$

- In Question 9, if you conclude that the limit exists then you must show that the definition of "$\lim_{x\to 1} f(x) = L$" holds for some real number L. One the other hand if you conclude the limit does not exist, then you must show that the definition of "$\lim_{x\to 1} f(x) = L$" fails for every real number L. In either case an informal explanation will not suffice.