

Homework 11 (Due Thurs, Apr 24)

Math 2710 – Spring 2014

Professor Hohn

The goal of this assignment is to improve our proof writing skills and learn to gage whether a proof is a “good” proof or not.

1. Read: Read the article [Some Remarks on Writing Mathematical Proofs](#) written by John M. Lee about writing proofs. The author outlines common mathematical practices used in mathematical writing.
2. Analyze: Is the following proof a “good proof” in the sense of the article that you read (was the argument well thought out, easy to understand, written with precision, etc)? What did the writer do correctly? What could the proof writer do to improve?

Midterm 2 - Preview: Question 12(a):

Let A and B be sets. The *symmetric difference* of A and B is denoted $A\Delta B$ and is defined by

$$A\Delta B = (A - B) \cup (B - A).$$

Prove that $A\Delta B \subseteq A$ iff $B \subseteq A$.

Proof. Let A and B be sets. We want to show that $A\Delta B \subseteq A$ iff $B \subseteq A$.

Suppose $A\Delta B \subseteq A$. Let $x \in B$. Then, $x \in ((B - A) \cup (A \cap B))$. So, $x \in (B - A)$ and $x \in A$. Or, $x \in (A \cap B)$ and $x \in A$. Hence, $x \in A$.

Suppose $B \subseteq A$. We want to show that $A\Delta B \subseteq A$. Let $x \in A\Delta B$. Then, $x \in ((A - B) \cup (B - A))$ and $x \in A$ because $B \subseteq A$. Hence, $A\Delta B \subseteq A$. \square

3. Peer Grade: Read your peers’ homework assignment, keeping in mind what you read about mathematical writing. Write a paragraph commenting on what was done correctly (was the argument well thought out, easy to understand, written with precision, etc). Then, comment on a couple things that could be improved upon. Now, grade you peer’s homework assignment (each question is worth 3 points).
4. Reflect: Write a paragraph about what you think you could improve upon when it comes to your mathematical writing. What do you struggle with the most?