Math 330 Section 3 Homework 10

Due date: Monday, October 19, 2015   *Running total:* 37 *points*
Last submission: Monday, November 2, 2015

Status - Reading Assignments:

Here is the status of the reading assignments you were asked to complete by this date.

Textbook:
    all of ch.1 - 7 (ch.7.2 was optional)

Other course material (course materials page):
    "Logic part 1", "Sets part 1", "Sets part 2", "Functions part 1", "Functions part 2"

"Lecture Notes: Math 330 - Additional Material":
    All of ch.3 (understand the material) all of ch.4 (understand the proofs!)

Reading assignment 1, due Friday, October 16:

a. Read carefully ch.8.1 - 8.3 of B/G.

b. In my Math 330 - Additional Material write-up re-read ch.3.1 on numbers. It is very conversational and mathematically not particularly challenging. The purpose is for you to remember the difference between integers, rational and real numbers.

Reading assignment 2, due Monday, October 19:

a. Finish B/G ch.8.4.

b. Refresh your memory from Calc 1 or study this for the first time: Read ch.1.7: "The Precise Definition of a Limit" in Stewart 7ed. If you have a different edition of that book then a chapter of this name should exist but it may be found elsewhere (in the 6th edition this would be ch.2.4). Read that short chapter and work through its examples. There are some pictures that illustrate the meaning of the "ε–δ definition" of the limit $\lim_{x \to x_0} f(x)$ of a function $f : A \longrightarrow \mathbb{R}$ with domain $A \subseteq \mathbb{R}$ at $x = x_0$. Be sure you understand how those pictures relate to the definition. **It is crucial that you understand this definition and can cite it from memory** – not literally of course, but such that what you write coincides mathematically with what's in the book.

Assignment 1: This is part of project 8.51 in B/G:

Let $B \subseteq \mathbb{R}$ be nonempty and assume that it has some lower bound. Give definitions
    1.a. of the infimum, also called greatest lower bound, $\inf(B)$ of the set B
    1.b. of the minimum $min(B)$ of the set B

Assignment 2:

This also is part of project 8.51 in B/G:

    2.a. Prove that if $\inf(B)$ exists then it is unique.

    2.b. Do the same for $\min(B)$.