Math 330 Section 3 Homework 11

Due date: Friday, October 23 *Running total: 39 points*
Last submission Friday, November 6

Status - Reading Assignments:

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

Textbook:
all of ch.1 - 8 (ch.7.2 was optional), ch.9.1

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!)

New reading assignments:

Reading assignment 1, due Friday, October 23:

a. Read carefully the remainder of ch.9 of B/G.

b. Read carefully ch.10.1, 10.2 of B/G. Be sure you are familiar with all the computational rules for $|x|$ listed in ch.9.2.

Reading assignment 2, due Monday, October 26:

a. read carefully B/G ch.10.3 and 10.4. Scrutinize the remarks (i), (ii), (iii) just before prop.10.11 on the distance function and try to relate the definition of a limit of a sequence given in ch.10.4 to that of limits of functions $\lim_{x \to a} f(x)$ as you find it in Stewart's Calculus.

b. MF lecture notes: Read all of ch.5.1 and read ch.5.2 up to and including definition 5.13 (liminf and limsup of a sequence). Ch.5.1 should be an easy read, but be sure you understand how to work with the material presented there. The part of ch.5.2 due Monday is mostly easy consequences and extensions of the concept of sup and inf from sets to functions and sequences. The last remark 5.2 on some properties of tail sets of sequences is an exception. You will have to dig in to understand what is being discussed there. Whatever is due in ch.5.2 you must read very carefully as it will be used extensively when we further proceed in the course.

Assignment 1:

Prove B/G Prop.9.7 (ii): The composition of two surjective functions is surjective.

Assignment 2:

Prove the "$\Rightarrow$" direction of B/G Prop.9.12: Let A, B be two non-empty sets. Assume there exists an injective function $f : A \longrightarrow B$. Prove that there exists a surjective function $g : B \longrightarrow A$.