Math 330 Section 5 - Spring 2022 - Homework 10

Published: Thursday, March 24, 2022 *Running total:* 41 *points*
Last submission: Friday, April 8, 2022

Status - Reading Assignments:

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

MF lecture notes:
ch.2.1 - 2.4, ch.3, ch.4 (skim), ch.5 - 8 (skip 6.5, skim 8.2, 8.4 after Prop.8.11, ch.8.5), ch.9.1 - 9.2

B/G (Beck/Geoghegan) Textbook:
ch.1 - 7.1

B/K lecture notes:
ch.1.1 (Introduction to sets) (optional)
ch.1.2 (Introduction to Functions) but skip ch.1.2.4: Floor and Ceiling Functions (optional)

Other:
Stewart Calculus 9ed - ch.1.7: "The Precise Definition of a Limit". If you have a newer or older edition then you may have to search through the table of contents and/or consult the index.

New reading assignments:

Reading assignment 1 - due Monday, March 28:

- **a.** Review Stewart Calculus 9ed - ch.1.7: "The Precise Definition of a Limit". If you have a newer or older edition then you may have to search through the table of contents and/or consult the index.
- **b.** Read carefully MF ch.9.3.

Reading assignment 2 - due: Wednesday, March 30:

- **a.** Read carefully MF ch.9.4.
- **b.** Read carefully MF ch.9.5.
- **c.** Review B/G ch.8. You know all its material from MF ch.3 and ch.9.1.

Reading assignment 3 - due Friday, April 1:

- Read carefully MF ch.9.6.
- Read carefully MF ch.9.7.
- **c.** Review B/G ch.9. You know all its material from MF ch.5 and ch.6.

Written assignments are on p.2.

General note on written assignments: Unless expressly stated otherwise, to prove a proposition or theorem you are allowed to make use of everything in the book up to but NOT including the specific item you are asked to prove.

Written assignment 1: Prove Corollary 7.1**(b)** (pigeonhole principle):

Let $m, n \in \mathbb{N}$. If $m > n$ then there exists no injective function $g : [m] \to [n]$.

Written assignment 2:
Prove Corollary 7.1**(d):** Let $m \in \mathbb{N}$. There exists no surjective function $h : [m] \to \mathbb{N}$.

Written assignment 3: Let the sets A_n and integers a_n $(n \in \mathbb{N})$ be defined as in Proposition 7.6.

Prove Proposition 7.6**(c):** If $A_n \neq \emptyset$ then $a_n \geqq n$.