Math 330 Section 1 - Spring 2026 - Homework 09

Published: Wednesday, March 4, 2026   Running total: 34 points
Last submission: Friday, March 20, 2026

Status - Reading Assignments:

The reading assignments you were asked to complete before the first one of this HW are:

MF lecture notes:
    ch.1 – ch.3, skim ch.4, ch.5.1 – ch.8

B/G (Beck/Geoghegan) Textbook:
    ch.1 – 5, ch.9

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)

New reading assignments:

Reading assignment 1 - due Monday, March 9:
   a. Carefully read MF ch.9.1.
   b. Carefully read MF ch.9.2. Much of it is just a repeat of Ch.3.5.

Reading assignment 2 - due Wednesday, March 11:
   a. Review Stewart Calculus 7ed - ch.1.7: "The Precise Definition of a Limit". If you have a newer or older edition, you may have to search through the table of contents and/or consult the index.
   b. Extra carefully read MF ch.9.3. Convergence and continuity will be address in much more general settings in the chapters on metric and topological spaces and it is important that you are at ease with this material, including proofs!

Reading assignment 3 - due Friday, March 13:
   a. Read B/G ch.8. You already have encountered the material in MF ch.3 and 9.1 - 9.2.
   b. Carefully read MF ch.9.4 and 9.5.

Additional reading assignment (optional):
   a. If you have not taken or are not currently taking linear algebra, this would be a good time to look at MF ch.11 through Example 11.11. That's nine pages of very easy material.

> **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 assignments are on the next page.

Written assignment 1:

Prove Lemma 7.1: Let X, Ω be sets such that $X \subsetneq \Omega$ and $\omega \in X^\complement$, and let $\mathfrak{B} := \{A \uplus \{\omega\} : A \in 2^X\}$. Then the function $F : 2^X \to \mathfrak{B}; \ A \mapsto A \uplus \{\omega\}$ is a bijection.

Written assignment 2:

Prove Cor.7.3: If X is uncountable and $A \subseteq X$ is countable then $A^\complement$ is uncountable.