

Math 330 Section 5 - Fall 2022 - Homework 10

Published: Tuesday, October 11, 2022
Last submission: Friday, October 28, 2022

Running total: 37 points

Status - Reading Assignments:

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

MF lecture notes:

ch.2 – ch.3; skim ch.4; ch.5.1 – ch.5.2; ch.6 - 9.3 through Prop.9.17

B/G (Beck/Geoghegan) Textbook:

ch.1 – ch.6; skim ch.7

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, October 17:

- a. Read carefully the remainder of MF ch.9.3., but only skim the proof of Proposition 9.20. **Truly important:** The equivalence of “sequence continuity” and “ ε - δ -continuity”

Reading assignment 2 - due: Wednesday, October 19:

- a. Read carefully MF ch.9.4 and ch.9.5.

Reading assignment 3 - due Friday, October 21:

- a. Skim the B/G chapters corresponding to MF ch.9.1 – 9.5: B/G ch.8 and ch.10.1 – 10.4.

Written assignment 1:

Prove Proposition 6.39: Let $n \in \mathbb{N}$ such that $n > 1$. Then n has a prime factorization.

Hint: Use strong induction on n .

Written assignment 2:

Prove the following part of Proposition 6.40:

If two natural numbers m and n are relatively prime then they possess no common factors:

Hint: Use Proposition 6.37.

Written assignment 3: Prove Lemma 7.1: Let X, Ω be sets such that $X \subsetneq \Omega$ and $\omega \in X^c$, and let $\mathfrak{B} := \{A \uplus \{\omega\} : A \in 2^X\}$.

Then the function $F : 2^X \rightarrow \mathfrak{B}; A \mapsto A \uplus \{\omega\}$ is a bijection.