Math 330 Section 4 - Fall 2021 - Homework 08

Published: Thursday, September 30, 2021   *Running total:* 35 *points*
Last submission: Wednesday, October 20, 2021

Status - previously assigned reading Assignments:

B/G (Beck/Geoghegan) Textbook:
     ch.1-5, ch.6.1-6.3

MF lecture notes:
     ch.2-3, skim ch.4, ch.5-6.10

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 4:

- Prepare for the midterm.

Reading assignment 2 - due: Wednesday, October 6:

- **a.** Read carefully MF ch.6.11–6.12. Review the end of B/G ch.2: start after prop.2.33.
- **b.** Read carefully B/G ch.6.4. All of this material is covered in MF ch.6.11–6.12.

Reading assignment 3 - due Friday, October 8:

- **a.** Read carefully the remainder of MF ch.6.
- **b.** Read carefully B/G ch.7 until before the proof of Theorem 7.17. All of this material is covered in MF ch.6.13–6.14. Skip the remainder of this chapter.

> 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 MF Proposition 6.4: Let $n \in \mathbb{N}$. Then $e(n) \in P$, i.e., $e(n)$ is positive.

Written assignment 2:
Prove prop.6.11.**c**: Let $\beta \in (R, \oplus, \odot, P)$ and $k, m \in]0, \infty[_{\mathbb{Z}}$. Then $(\beta^m)^k = \beta^{mk}$.

Hint: Use induction on k.

Written assignment 3:
Prove B/G prop.2.18(ii) by induction on n: If $n \in \mathbb{N}$ then $4 \mid (k^4 - 6k^3 + 11k^2 - 6k)$.