

Math 330 Section 6 - Fall 2019 - Homework 09

Published: Thursday, October 3, 2019
Last submission: Friday, October 18, 2019

Running total: 36 points

Status - Reading Assignments:

Here is the status of the reading assignments you were asked to complete so far

B/G (Beck/Geoghegan) Textbook:
ch.1 – ch.7 (ch.7 only until thm.7.17)

MF lecture notes:
ch.2, ch.3, ch.5 – ch.7.3

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 7:

- a. Read carefully the remainder of MF ch.7 (i.e., ch.7.4)

Reading assignment 2 - due: Wednesday, October 9: (no class)

- a. Read carefully MF ch.8.1 and 8.3, and skim the optional ch.8.2

Reading assignment 3 - due Friday, October 11:

- a. Read carefully MF ch.8.4 (but only through prop.8.10: the remainder is optional)

Written assignment 1: Prove B/G prop.6.17: Let $n \in \mathbb{Z}$. Then n is even if and only if n^2 is even.

Hint: It suffices to show that if n is odd then n^2 is odd, and if n is even then n^2 is even: See the proof strategy of the proof of prop.?? on p.??.

Written assignment 2: Prove exercise 6.4 of the MF document:

For $m, n \in \mathbb{Z}$ let $S := S(m, n) := \{k \in \mathbb{N} : k = mx + ny \text{ for some } x, y, \in \mathbb{Z}\}$.

Then S is empty if and only if $m = n = 0$.

Hint: The difficult part is proving that S is not empty if at least one of m, n is not zero. What does S look like if $m = 0$ and $n \neq 0$? Do that case first, then do the case where both m and n are not zero. Play around with specific number to see what happens before you attempt to do the proof. \square