

## Math 330 Section 2 - Fall 2018 - Homework 09

*Published: Thursday, August 27, 2018*

*Running total: 37 points*

*Last submission: Monday, September 15, 2018 (after the Fall Break)*

### Status - Reading Assignments:

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

B/G (Beck/Geoghegan) Textbook:

Preface, ch.1 – ch.6, ch.7.1 (only prop.7.9 – prop.7.12), ch.9.1.

MF lecture notes:

ch.1 – ch.3, ch.5, ch.6 (skip ch.6.3), ch.7, ch.8 (skip ch.8.3), ch.9.1

ch.19.7.2 (The Addition Algorithm for Two Nonnegative Numbers (Base 10))

Any “Addenda” subchapters: those will be added to without notice.

B/K lecture notes (optional):

ch.1.1 (Introduction to sets)

ch.1.2 (Introduction to Functions) but skip ch.1.2.4: Floor and Ceiling Functions

### New reading assignments:

#### Reading assignment 1 - due Monday, October 1:

- a. Read carefully MF ch.9.2 Indicator Functions and compare to the material in B/G ch.4.4.
- b. Read carefully MF ch.10.1. Note that all propositions in MF ch.3 on ordered integral domains apply to  $(\mathbb{R}, +, \cdot, \mathbb{R}_{>0})$ .

#### Reading assignment 2 - due: Wednesday, October 3:

- a. Read carefully B/G ch.8. Note that almost everything there is also covered in MF ch.3 and MF ch.10.1

#### Reading assignment 3 - due Friday, October 5:

- a. Read carefully MF ch.10.2.
- b. Read carefully the remainder of BG ch.9. Reread MF thm.10.1.

**Written assignment 1:** Use anything up-to and including MF thm.7.3 to prove MF cor.7.3:

Let the set  $X$  be uncountable and let  $A \subseteq X$  be countable. Then its complement  $A^c$  is uncountable.

#### Written assignment 2:

Prove the following half of thm.8.1.b (De Morgan’s Law):

Let  $(A_\alpha)_{\alpha \in I}$  be a family of subsets of a universal set  $\Omega$ . Then  $(\bigcap_{\alpha} A_\alpha)^c \subseteq \bigcup_{\alpha} A_\alpha^c$ .