Math 330 Section 5 - Spring 2018 - Homework 15

Published: Thursday, April 12, 2018 *Running total:* 53 *points*
Last submission: Friday, May 4, 2018

Status - Reading Assignments:

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

B/G (Beck/Geoghegan) Textbook:
- all of ch.1 – ch.7 (ch.7: skip all after thm.7.17),
- ch.8 – 13

MF lecture notes:
- ch.1 – ch.3, ch.5 – ch.8 (skip ch.6.3),
- ch.9 (see hwk 10 for exceptions to ch.9.4), ch.10, ch.11 through ch.11.3.1
- ch.17 (Addenda to B/G): the chapters corresponding to what has been assigned so far from B/G.

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

Other:
Stewart Calculus 7ed - ch.1.7: "The Precise Definition of a Limit". If you have a newer or older edition then you may have to search through the table of contents and/or consult the index.

New reading assignments:

Reading assignment 1 - due Monday, April 23:

Carefully read the remainder of MF ch.11, i.e., ch.11.3.2: Infinite Series. Skip the proof of thm.11.18 (Riemann's Rearrangement Theorem)

Reading assignment 2 - due: Wednesday, April 25:

Carefully read MF ch.12.1 – 12.4 Make plenty of drawings!

Reading assignment 3 - due Friday, April 27:

Carefully read the remainder of MF ch.12. Make more drawings!

Written assignments on next page!

Written assignment 1: (worth 2 points, one each for **a**, **b**).
Do MF exercise 11.5: Let $a, b \in \mathbb{R}$ such that $a < b$. Prove the following.

a. The closed interval $[\,a, b\,]$ is not open in $(\mathbb{R}, d_{|\cdot|})$.
b. The complement of the closed interval $[\,a, b\,]$ is open in $(\mathbb{R}, d_{|\cdot|})$.

You are not allowed to use material beyond ch.11.1.3 (Neighborhoods and Open Sets) to prove any of this.

Hint for b: What is $[\,a, b\,]^{\complement}$? Work with $\varepsilon = a - x$ or $\varepsilon = x - b$ to find neighborhoods of x which are entirely contained inside $[\,a, b\,]^{\complement}$.