# Math 330 Section 5 - Spring 2018 - Homework 11

*Published: Thursday, March 15, 2018*          *Running total:* 43 *points*
*Last submission: Monday, April 9, 2018*

**Update Feb 16, 2018**

> *The last submission is due after spring break, on Monday, April 9.*

**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, ch.9, ch.10.3 – ch.10.5 (ch.10.1 and 10.2 are assigned this week)

MF lecture notes:
- ch.1 – ch.3, ch.5 – ch.7 (skip ch.6.3),
- ch.9.1 - 9.5 (see hwk 10 for exceptions to ch.9.4).
- 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, March 19:**

   **a.**   Read carefully B/G ch.10.1. and ch.10.2 (should have been assigned last week). Be sure to read the MF ch.17 addenda to B/G ch.10!
   **b.**   Read carefully B/G ch.11.1.

**Reading assignment 2 - due Wednesday, March 21:**

   **a.**   Read carefully the remainder of B/G ch.11.
   **b.**   Read carefully B/G ch.12.1 on infinite series. Compare to MF ch.9.3.

**Reading assignment 3 - due Friday, March 23:**

   **a.**   Read carefully the remainder of B/G ch.12.
   **b.**   Read carefully the corresponding parts of MF ch.17.12 (LOTS of proofs and simplifications!)

**Written assignment 1: One point each** for **a**, **b**, and **c**.

Let $a, b, c, d \in \mathbb{R}$ such that $a < b$ and $c < d$. Let $f : \, ]a, b[ \, \rightarrow \, ]c, d[$ be bijective and strictly increasing.

    **a.**   Prove that $f$ is continuous.

    **b.**   Prove that $f^{-1}$ also is strictly increasing.

    **c.**   Now use **a** and **b** to prove that $f^{-1}$ is continuous.

**Hint:** Use MF thm.9.1: $f$ is (sequence) continuous iff $f$ is "$\varepsilon$–$\delta$ continuous" to prove **a**.