# Math 330 Section 7 - Spring 2019 - Homework 07

*Published: Thursday, January 18, 2019*       *Running total:* 31 *points*
*Last submission: Friday, March 1, 2019*

**Status - Reading Assignments:**

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

B/G (Beck/Geoghegan) Textbook:
    Preface and ch.1 – ch5


MF lecture notes:
    ch.1 – ch.3; ch.5, ch.6 through ch.6.6 (skim ch.6.3)


B/K lecture notes:
    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, February 18:**

    **a.**   Read carefully MF ch.6.7 – 6.9


**Reading assignment 2 - due: Wednesday, February 20:**

    **a.**   Finish MF ch.6: Read carefully MF ch.6.10 – 6.12.


**Reading assignment 3 - due Friday, February 22:**

    **a.**   Read carefully MF ch.7.1 and 7.2. Skip or skim the proof of prop.7.3.


**Written assignment 1:** Prove B/G Prop. 4.7(i) by induction: Let $k \in \mathbb{N}$. Then there exists $j \in \mathbb{N}$ such that $5^{2k} - 1 = 24j$. In other words, $24 \mid (5^{2k} - 1)$ according to MF def.6.11 in ch6.4 (Divisibility) or the definitions that follow B/G prop.1.14.

**Written assignment 2:** Prove MF Prop. 6.3.1 by induction on $c$: Let $(x_j)_{j\in\mathbb{N}}$ be a sequence in $\mathbb{Z}$ and let $a, b, c \in \mathbb{Z}$ such that $a \le b < c$. Then

$$\sum_{j=a}^{c} x_j \;=\; \sum_{j=a}^{b} x_j \;+\; \sum_{j=b+1}^{c} x_j.$$

Hints: Think carefully about the base case: If $a = 5$, how would you choose $b$ and $c$? If $a = 28$, how would you choose $b$ and $c$? For general $a$, how would you choose $b$ and $c$?