

Math 330 Section 5 - Spring 2018 - Homework 01

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Running total: 5 points

Last submission: Friday, January 26, 2017

Status - Reading Assignments:

Here you would find the previously assigned reading assignments. There are none because this is your first homework.

New reading assignments:

In the following B/G refers to the (yellow) textbook and MF refers to the Instructor's lecture notes (see the Course Material page of the course website).

Reading assignment 1 - due Wednesday, January 17:

- a. Read ch.2.1 through ch.2.3 of the MF doc. You should be familiar with most if not all the material of ch.2.1 and ch.2.2. You need to be familiar with the differences between natural numbers, integers, and rational numbers and have a basic understanding of why an expression like $a + b$ can be thought of as a function of two variables a and b .
Note that the material of ch.2.1 – 2.2 is considered general knowledge for anyone who has studied at least one semester of calculus, a prerequisite for this course. I will skip most of those chapters in class.
- b. Read carefully ch.3 (The Axiomatic Method) of the MF doc.

If you did not see this assignment in time for Wednesday's lecture then be sure to complete the first reading assignment by Friday, January 19.

Reading assignment 2 - due Friday, January 19:

- a. Read the preface and the notes for both student and instructor in the B/G (Beck Geoghegan) text.
- b. Read carefully B/G ch.1 (Integers).
- c. Read ch.1 (Before You Start) of the MF document.
- d. Look at the sample homework assignment which is posted on the Homework page of the course website.

General note on written assignments: Unless expressly stated otherwise, to prove a proposition or theorem you are allowed to make use of everything in the book **up to but NOT including** the specific item you are asked to prove.

Written assignment 1:

Prove B/G Prop.1.8: Let $a \in \mathbb{Z}$. Then $(-a) + a = 0$.

Use here and in all subsequent homeworks the notation given in the assignment sheet, **even if the symbols are different from the ones used in the text!**

Written assignment 2:

Prove B/G Prop.1.10: Let $a, x_1, x_2 \in \mathbb{Z}$. If both $a + x_1 = 0$ and $a + x_2 = 0$ then $x_1 = x_2$.

Hint: You may use B/G prop.1.6 – 1.9 in addition to the axioms.

Hints for assignments #3 and #4:

- a. Do **NOT** use commutativity: the variables appear in the same left-to-right order on both sides!
- b. Obviously you'll have to utilize ax.1.1(ii) to prove #3 and #4. Tell me what you plug in for m, n, p in that axiom.

Written assignment 3:

Prove B/G Prop.1.11(ii), part 1: Let $a, b, x, y \in \mathbb{Z}$. Then $a + (b + (x + y)) = (a + b) + (x + y)$

Written assignment 4:

Prove B/G Prop.1.11(ii), part 2: Let $a, b, x, y \in \mathbb{Z}$. Then $(a + b) + (x + y) = (a + (b + x)) + y$

Written assignment 5:

Prove B/G Prop.1.11(iv): Let $x, y, z \in \mathbb{Z}$. Then $x(yz) = z(xy)$