Math 330 Section 3 Homework 04

Written assignments:
   ONLY ONE submission: Friday, September 25
   Last submission: Friday, September 25

Status - Reading Assignments:

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

Textbook: all of ch. 1 - 3

Other course material (course materials page):
   "Logic part 1", "Sets part 1"

New reading assignments:

Reading assignment 1 - due: Monday, September 21

Read carefully ch. 4.1 - 4.3 in the book. That's just a little bit more than 4 pages.

Reading assignment 2 - due: Friday, September 25 Click the link "Sets part 2" in the course materials page of the web site and read the document according to the guidelines I have outlined. Of particular importance are the three methods of proof for set identities in ch.1.11 (Set identities).

As is true for all the additional readings, be prepared to encounter different notation in the book and in lecture. In lecture you will see
   $A \setminus B$ instead of $A - B$ for the set difference,
   $A \Delta B$ instead of $A \oplus B$ for the symmetric set difference,
   Ω instead of S or U for the universal set,
   $A^{\complement}$ or A^c instead of $\bar{A}$ for the complement.

Relevant for quizzes and exams: Be able to do assignments like the ones that follow now.

All exercises below are taken from "Sets part 1" and **not part 2!** They will be **graded only once** like homework you submit in other math courses. Those four exercises count for a total of 8 points, so make an effort to get them all done. I'll assign a fractional grade for each assignment and the sum of those four numbers will be rounded.

Written assignment 1: Do exercise 1.5.1:

Let $A = \{1, 2, \{1\}, \{1, 2\}\}$. True or false?

(a) $\{1\} \in A$ (c) $\{\{1\}\} \in A$ (e) $2 \in A$ (g) $\{2\} \in A$
(b) $\{1\} \subseteq A$ (d) $\{\{1\}\} \subseteq A$ (f) $2 \subseteq A$ (h) $\{2\} \subseteq A$

Written assignment 2: Do exercise 1.6.1:

Let $A = \{1, 2, \{1\}, \{1, 2\}\}$, $B = \{1, \{2\}\}$, $C = \{1, 2, 2, 2\}$, $D = \{5n : n \in \mathbb{R}\}$ and $E = \{5n : n \in \mathbb{Z}\}$.

Find the cardinality of each set.

Written assignment 3: Do exercise 1.8.1:

Let $A = \{1, 2, \{1\}, \{1, 2\}\}$ and $B = \{1, \{2\}\}$. True or false?

(a) $2 \in A \cap B$ (b) $2 \in A \cup B$ (c) $2 \in A \setminus B$
(d) $\{2\} \in A \cap B$ (e) $\{2\} \in A \cup B$ (f) $\{2\} \in A \setminus B$

Written assignment 4: Do exercise 1.9.1:

Let $A = \{a, b, c, d, e\}$ and let $B = \{1, 2\}$. Find

(1) $B \times A$,
(2) $|B \times A|$.
(3) Is $(a, 2) \in B \times A$?
(4) Is $(2, a) \in B \times A$?
(4) Is $2a \in B \times A$?