Math 250: Daily Preparation

Overview

In our next meeting, we will be further investigating what it means to prove theorems about relationships among sets. Throughout, there is an essential emphasis on conditional statements: as we saw in class recently, a statement such as "For all sets A and B in a universal set U, if $A \subseteq B$, then $B^c \subseteq A^c$" involve *multiple* conditional statements: in particular, the hypothesis of this conditional statement is a conditional statement, and the conclusion of this conditional statement is a conditional statement. As we work in such complicated sentences, we must hone our logic and writing skills further, being especially clear about our assumptions and methods of proof.

Basic learning objectives

These are the tasks you should be able to perform with reasonable fluency **when you arrive at our next class meeting**. Important new vocabulary words are indicated *in italics*.

- Know and understand the definition of *subset* and how this definition involves a conditional statement.
- Understand how to prove that a given set A is a subset of another given set B.
- Understand the basic idea of the "*choose-an-element*" method.

Advanced learning objectives

In addition to mastering the basic objectives, here are the tasks you should be able to perform in the near future **with practice and further study**:

- Be able to recognize and proof key relationships among sets, including when one set is a subset of another and when two sets are equal to one another.

Resources

Reading: Read Section 5.2 pages 230-234 (up to Progress Check 5.8).

Watching: Here are some additional resources that have been developed to support your learning:

- Screencast 5.2.1: http://gvsu.edu/s/u6
- Screencast 5.2.3: http://gvsu.edu/s/u6

Questions

Respond to the following questions on separate paper, as explained in the document that describes guidelines and expectations for daily preparatory assignments. You should be prepared to show me your responses at the start of class; I will review your work briefly sometime before the end of class.

1. Complete Preview Activity 1 on p. 230-231.

2. Complete Preview Activity 2 on p. 232.

3. In your own words, explain what the "choose-an-element" method of proof is. Further, what 3-letter word often indicates that we are using this approach?

4. What conditional statement must we prove in order to show that a set X is a subset of a set Y?