Math 250: Daily Preparation

Overview

This will be the final daily prep assignment of the term. In class on Tuesday, we'll consider Section 7.4, which is one specific application of the ideas from section 7.3. We'll look at the equivalence relation generated by congruence modulo n on $\mathbb{Z}$, and realize that the language and structure of equivalence relations enables us to take a very sophisticated view of the set of integers, one that we have hinted at in many ways this semester.

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*.

- Be familiar with the term *modular arithmetic*.
- Understand the relationship between modular arithmetic and equivalence classes.
- Understand the "bracket notation" in the context of modular arithmetic.

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**:

- Understand how congruence modulo n *is* an equivalence relation on $\mathbb{Z}$.
- Connect the big ideas of congruence modulo n that we've studied all semester to those of equivalence relations.
- Understand and prove facts about $\mathbb{Z}_n$ under the special operations of $\oplus$ and $\odot$.

Resources

Reading: Read pages 402-405

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

- Screencast 7.4.1: <http://gvsu.edu/s/wh>

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 page 400.

2. Complete Preview Activity 2 on page 401.

3. What familiar idea is represented by a "congruence class"? For example, what do we mean by "the congruence class of 4 modulo 7"?