

# Math 109 Winter 2010 Homework 8

Due 2/26/10 in class

(All exercise and page numbers refer to Eccles.)

## Exam II

Exam II on Monday 2/22 covers Chapters 7, 8, 9, 15, 16, 17, 18, and concentrates on the material addressed on homeworks 4-7.

## Reading

Read chapters 19, 21, and especially 22. We will not cover Chapter 20, section 19.3, or Section 21.4, of those chapters, but feel free to read them of course. Do the end of the chapter exercises for practice (only the ones related to material we covered), but do not hand them in.

## Exercises to submit on Friday 2/26

In the Exercises V which begin on page 271 of the text, do #1, 2, 3, 4, 7.

*Remarks/hints:* Some of these problems can be done without the language of congruences. For example, #1 has an induction proof. But the point of these problems is to use the language/theory of congruences, which usually makes things much easier.

V.1: For example, this problem can be rephrased in terms of congruences: it asks you to show that  $6^n + 1 \equiv 0 \pmod{7}$  for all odd  $n \geq 1$ .

V.3: Note that when you write  $n$  in decimal notation as  $a_k a_{k-1} \dots a_2 a_1 a_0$ , what you really mean is that  $n = a_k 10^k + a_{k-1} 10^{k-1} + \dots + a_1(10) + a_0(1)$ . Since the question is about whether something is a multiple of 9, that suggests you should now think modulo 9.

V.4: Similar hint as for V.3.