Math 8201   **Homework 11**   **PJW**
Date due: December 4, 2017. There will be a quiz on this date.

Hand in only the starred questions.

     We have a quiz on Monday November 20 and there is no class on Friday November 24 because of Thanksgiving. Because of this there will be no homework due Monday November 27. This homework is due December 4, with a quiz on this date.

Section 7.3 1, 2, 5, 6, 8, 10, 14, 17, 21*, 22, 29, 30*, 34, 35, 37

Section 7.4 6*, 7, 8*, 11*, 12, 13, 15, 19, 23*, 24, 27, 30, 31, 37*, 38, 40

Section 7.5 5

Section 7.6 1, 2, 3, 5, 5c*, 7.

     On Wednesday December 6 I will give you a preliminary grade for this semester, based on your performance so far on the six quizzes and homeworks 1 - 10. On Monday December 11 I will hand out a Final Homework, which is a take-home exam. If you do not attempt this exam, your grade for the course will be the preliminary grade I have given you. If you do attempt this exam, your grade for the course may improve on your preliminary grade or stay the same, but it will not go down from the preliminary grade. Attempts on the Final Homework should be done without consulting any other person. You may consult any books that you wish. Your work for the final homework should be handed in to me (or to my mailbox) by **4pm on Tuesday December 19**.

     I am (rather optimistically) hoping that we will get the end of Chapter 8 by the end of the semester. I will not take in any more (ordinary) homework, but the following is a list of the questions that seem to me to be instructive, and relevant to the syllabus of this course. If I were to ask for questions to be handed in, they would be: Sec 7.5 no. 5, Sec 7.6 nos. 1, 5c; Sec 8.1 nos. 5, 7, 10; and question KK.

KK. Let $\mathbb{F}_3 = \{0, 1, -1\}$ be the field with three elements, and let $f(X) = X^2 + X - 1 \in \mathbb{F}_3[X]$. Write $\alpha = X + (f) \in \mathbb{F}_3[X]/(f)$.
   (a) Express each of $\alpha^2, \alpha^3, \alpha^4, \alpha^5, \alpha^6, \alpha^7, \alpha^8, \alpha^9$ in the form $u + v\alpha$, where $u, v \in \mathbb{F}_3$. (Thus verify that $\mathbb{F}_3[X]/(f)$ is a field.)
   (b) Express $\alpha^2 + \alpha^3$ as a power of α.

Section 8.1 3, 4, 5, 7, 9, 10.

Section 8.2 1, 5, 6, 8

Section 8.3 1, 3, 4, 5, 6, 7, 8.