TEST 2 will be in PKH 304, 3:00-3:50 pm on Thurs Mar 26

- See above for date, time and location of TEST 2. The time in class before the test will be available for asking me questions.

- The material covered on TEST 2 is the same as that covered on the homework from Sections 18-24, 26, 27 inclusive. The homework for that material is posted online at my website http://www.uta.edu/math/vancliff/T/S09/hwk4321.html.

- My office hours are TR 2:00-2:25 pm and TR 3:50-4:20 pm. In addition, the class time before the test starts will be available for asking me questions.

- When I write a test, I look over the lecture notes & homework for that test, & use them to model at least 60% of the test problems (& most of them are fair game). You should expect an assortment of different types of questions as you saw on Test 1: a few asking for definitions, state a certain theorem, give a short proof of a result, a few asking you to solve homework questions, & a few asking you to solve a problem similar to one on the homework.

- Thus, an effective way to review is to go over the homework problems you have not already done & make sure you understand all the homework well and Test 1 (& its solution sheet) well, by 48 hours prior to the test. Some study questions are on page 2, and are also best completed at least 48 hours before the test. In the last 48 hours, reread ALL the homework/study problems & skim through the lecture notes and quiz yourself using the true/false questions in the book.

- Only calculators specified on the first-day handout will be permitted in the test. If you bring one, make sure the batteries are working. Also bring some form of photo ID.

- Try to keep your eyes on your own work during the test.

- If you wish to leave the room during the test, you should ask permission first & turn in your test to me. Only in exceptional circumstances will I let you continue the test should you return. (So it is better to be 3 minutes late to the test, rather than ask to go to the bathroom during the test.) If you finish early but prefer to stay in the room, then you should NOT get out any work, book or item, no matter what the subject matter is. Should you wish to leave the test early, then you may.

- It is your responsibility to be on time.

- I plan to return the graded test to you on Tues Mar 31 with a solution sheet.

To help with your studying, some suggestions of problems for your study are over the page; only those listed on the homework website will be graded.
1. Go over Test 1 and its solution sheet.

2. From sections 18-22, the following questions from the homework are the most relevant: pg 176: 38, 40; pg 183: 28; pg 189: 11, 13; pg 196: 2, 14; pg 207: 14. From sections 23-27, all the homework questions are relevant!

3. pg 176: 41, 42, 48, 50.

4. Let $R$ be a ring and let $a \in R$ be such that $a^2 = 0$. Prove that for any $b \in R$, $a$ commutes with $ba + ab$.

5. Prove that a ring has at most one unity.

6. Let $E$ denote the set of even integers. Define addition $+$ on $E$ in the usual way, but define an operation $*$ on $E$ by $m * n = \frac{mn}{2}$ for all $m, n \in E$. Prove that $(E, +, *)$ is a ring with unity.

7. Let $X = \left\{ \begin{bmatrix} a & b \\ 0 & 0 \end{bmatrix} : a, b \in \mathbb{Z} \right\}$. Is $X$ a subring of $M_2(\mathbb{Z})$?

8. Let $Y = \left\{ \begin{bmatrix} a & b \\ 0 & c \end{bmatrix} : a, b, c \in \mathbb{Z} \right\}$. Is $Y$ a subring of $M_2(\mathbb{Z})$?

9. The center of a ring $R$ is defined to be $\{ c \in R : cr = rc$ for all $r \in R \}$. Prove that the center of $R$ is a subring of $R$.

10. Suppose $R$ and $S$ are isomorphic rings. Prove that if $R$ is commutative, then so is $S$.

11. Suppose $R$ and $S$ are isomorphic rings. Prove that if $R$ is an integral domain, then so is $S$.

12. Suppose $R$ and $S$ are isomorphic rings. Prove that $R$ and $S$ have the same characteristic.

13. Suppose $N$ is an ideal of a ring $R$. Prove that $R/N$ is commutative iff $ab - ba \in N$ for all $a, b \in R$.


15. Let $R = \mathbb{Z}_{20}$. Prove that $R/5R \cong \mathbb{Z}_5$.

16. Go over all true/false questions in the book from the sections covered.

17. Learn the statement of any theorem/result that has a name, such as the division algorithm for $F[x]$, where $F$ is a field. Learn definitions that arise frequently such as ideal, prime ideal, maximal ideal, irreducible polynomial, etc.