HOMEWORK #1 – MATH 435

DUE FRIDAY FEBRUARY 3RD

Do the following problems from Herstein:

(1) Pages 54 – 56, problems from Chapter 2, Section 3: #4, 5, 13.
(2) Pages 63 – 66, problems from Chapter 2, Section 4: #1, 3, 9, 15, 26

Also, not from Herstein:

(3) Prove that every Abelian group with 6 elements is cyclic.

Extra credit (worth up to 3 points to your homework score):
(Due Wednesday, February 8th)

Recall that $U(n)$ is the group of positive integers both less than and relatively prime to n, under multiplication modulo n. Compute many examples of $U(n)$ and try to determine for which n, $U(n)$ is cyclic. Write down a conjectural formula with substantial justification. If you can prove your formula is correct, or parts of it are, that's even better (and will be worth additional points above and beyond what's listed above).

Hint: It is ok to work with other up to 3 other people and turn in a joint project. Furthermore, writing a computer program to do the computations is quite reasonable – let me know if you'd like help with this. If you do write some software, please also turn in the source code.