MATH 109 WINTER 2007 HOMEWORK 1, DUE 1/12/07 IN CLASS

(All exercise and page numbers refer to Eccles.)

1. Reading and practice

Read Chapters 1-3 of Eccles. Do as many of the end of chapter exercises as you can, but do not hand them in. Check your work against the answers in the back.

2. Exercises to submit on Friday 1/12

1. In the Problems I which begin on page 53, do #1,2,3,5. In these problems, explain your answer as best you can but these do not need to be written out as formal proofs.

2. Do #4 on page 53, proving each statement by a direct proof. This exercise should be written out very carefully as a formal proof. Follow especially the examples of proofs given in class. Your proof should be written in complete sentences and avoid overuse of symbols (for example, in the body of the proof it is better to write "implies" rather than $\implies$ and "therefore" rather than $\therefore$). The proof should begin with the hypothesis and argue step by step to the conclusion (not the other way.) Remember to use the definition we have given of "divides" which is purely a notion about integers. Do not use fractions in your proof.

3. Prove by direct proof that if n is an odd integer, then n^2 is also an odd integer. You may assume in your proof that an integer n is odd if and only if $n = 2m+1$ for some integer m. (This is not how we defined odd, but we will prove later that it is an equivalent formulation of what it means to be odd. For now take it as a given.) Write this out as a formal proof following the same advice as in the previous problem.