

Math 109 Winter 2010 Homework 1

Due 1/9/10 in class

Reading

All references will be to the Eccles book. Read Chapters 1-4, and do the end of the chapter exercises (do not write up) as you read along. Note that the answers to these are in the back of the book.

Assigned problems from the text (write up and hand in.)

Problems I p. 53: #1, 2, 3, 4, 5.

Note that problems 1,2,3 and 5 are not problems that ask you to write out a formal proof of a statement. Still, briefly explain your answer as best as you can in these problems.

In problem 4, write out careful proofs. Follow 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. Remember to use the definition we have given of “divides” which is purely a notion about integers. Do not use fractions in your proof.

Additional problems (write up and hand in.)

1. Suppose that a and b are integers such that a divides b . Prove that if a is even, then b is even. (use the precise definitions of divides and even given in chapter 2. The same comments apply as for problem 4 above.)

2. Suppose that a and b are integers such that a divides b . Prove that if b is odd, then a is odd. (use the precise definitions of divides and odd given in chapter 2. The same comments apply as for problem 4 above. Hint: what is the contrapositive of the statement to be proved?)