The first week's homework covers "precalculus" material that is prerequisite for Calculus I. You should be familiar with this material, although you might not be completely comfortable with all of it. In the textbook, it's covered in Chapter 1, with some even more fundamental topics in Appendix A. Note that we will not cover all of this—or even mention all of it—in class, since it's assumed to be background material (and because we'll go over some of it later).

This homework covers some topics that are really fundamental. Other, more specialized stuff from Chapter 1 and Appendix A will be reviewed over the course of the semester, when we need it, but the material on this homework is used throughout the course.

Remember the general rules for homework assignments: You can work on the problems with other people in the class, and you can get help from me, from the math intern, or anyone else who will help you. However, you should write up your own set of solutions, in your own words and symbols. Your solutions should include explanations, for example: when they are asked for or when they are needed to explain why your answer is correct, when they will clarify the work that you have done, and whenever it is not obvious why some step that you take is valid. (You will never get much credit for an unsupported answer!) There is no way that your presentation of the solution, in your own words, will be identical to another student's.

This homework will be collected in class next Wednesday, September 8. Practice problems are ***not*** *to be turned in; for the most part, they are odd-numbered problems, and you can find the answers in the back of the textbook (except for the problems from the Appendix). Only a small number of problems are to be turned in for grading, but those problems are never enough to give you all the experience that you need to really learn the material. You should do the practice problems—and, if necessary, additional problems from the book.*

1. You need to know enough **algebra** to be able to solve equations and simplify expressions. This includes things like multiplying and factoring polynomials, the basic laws of exponents and roots, working with absolute value.

- **Practice Problems:** Appendix A, page 1068: #17, 19, 23, 25, 27
- **To turn in:** Appendix A, page 1068: #20, 34

2. You need to understand **coordinates** on the number line and on the plane, and the **geometric meaning** of simple equations and inequalities, that is, how they are drawn as points on the line or in the plane. This includes the **distance formula** and the equations and slopes of **lines**.

- **Practice Problems:** Appendix A, page 1068, #1, 33, 37, 49
- **To turn in:** Appendix A, page 1068, #34, 50

3. One of the most important objects of study in Calculus, and in all of mathematics, is **functions**. You need to understand function notation such as $f(x)$, various ways of defining functions, domain and range, and composition of functions.

- **Practice Problems:** Section 1.1, pages 7–9, #5, 23, 29, 37, 45, 73
- **To turn in:** Section 1.1, pages 7–9, #28, 38, 74

4. We will encounter a variety of examples that use **piecewise-defined functions**, so you should make sure that you understand the notation.

- **Practice Problems:** Section 1.2, pages 19–22, #15, 19, 51
- **To turn in:** Section 1.2, pages 19–22, #16, 50

5. You should know the definitions of the **exponential, logarithmic, and trigonometric** functions, but we will review their more advanced properties when we need them.

- **Practice Problems:** Section 1.3, pages 33–34, #37, 39, 43, 58, 60
  Section 1.4, page 45–46, #67, 75, 79
- **To turn in:** Section 1.3, pages 33–34, #42, 67
  Section 1.4, pages 45–46, #66