

## Math 112 homework #1. Due 10/3

*He who learns must suffer* - Aeschylus

Some of the questions on this homework set are straightforward, others are meant to be challenging. You can expect that homework from this course will grow *easier* as time goes on and your mathematical writing skills develop. But the only way to develop those skills is to struggle with a few difficult problems. Good luck.

- (1) Read chapter 0 and section 1.1 of the course notes, reviewing the material we covered in class.
- (2) Do the following exercises from pages 55-57 of the course notes:
  - 1.3
  - 1.4
  - 1.5
  - 1.6 (this is challenging, do your best. Remember to give a *proof*, not just a couple of examples)
  - 1.9
  - 1.11
- (3) Start with a real number  $c$ . Define the function  $f : \mathbb{R} \rightarrow \mathbb{R}$  by  $f(x) = cx$  (multiplying by the number  $c$ ). For which numbers  $c$  is this function one-to-one? For which numbers is the function onto? Justify your answer.