

**Homework 7**

**Due: October 31, 2012, in your discussion section**

PLEASE READ THE INSTRUCTIONS/SUGGESTIONS WRITTEN IN THE SYLLABUS!

Problems:

- 3.11, Page 145: 1, 2 c), 3, 4, 6,
- 3.15, Page 149: 5,
- Show that the following equation has a root:

$$\cos(\cos(\cos(\cos(x)))) = x$$

Hint: start with showing that  $\cos(x) = x$  has a solution.

BONUS PROBLEM: Suppose that a continuous function  $f$  satisfies  $f(x + y) = f(x) + f(y)$  for all  $x, y \in \mathbb{R}$ . Show that there exists a constant  $c$  so that  $f(x) = cx$  for all  $x$ .

DISCLAIMER: It is easy to find the solutions to (some of) these questions. (E.g. the internet, your fellow classmates ...) However, do NOT consult any of these solutions when working on this assignment or you will learn nothing from it and your chance of passing the course will be greatly diminished. If it becomes apparent to the grader that your solution is copied from existing solutions, you will be assigned a grade of zero for lack of originality.