

Homework 8

Due: November 7, 2012, in your discussion section

PLEASE READ THE INSTRUCTIONS/SUGGESTIONS WRITTEN IN THE SYLLABUS!

Problems:

- 3.20, Page 155: 2, 4, 6, 7, 8,
- We know that the function $f(x)$ is continuous on $[1, 2]$ and that $f(x) < x^2$ for all $x \in [1, 2]$. Show that there is an $\varepsilon > 0$ so that $f(x) < (1 - \varepsilon)x^2$ is also true for all $x \in [1, 2]$.
- Show that $f(x) = 1/x$ is not uniformly continuous on $(0, 1)$.

BONUS PROBLEM: Suppose that a non-constant, continuous function f is periodic with period p (i.e. $f(x) = f(x + p)$ for all x). Show that it must have a smallest period.

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.