

Math 305, Problem Set #7
(due **by email** Friday, 11/6/09, 10:30 a.m.)

Abbott, section 4.2, problems 3(b), 5(a), and 6.

Abbott, section 4.3, problems 3, 7, and 8.

Extra problem A: Apply the Sequential Criterion for Functional Limits to the function $f(x) = |x|/x$, the point $c = 0$, and the sequence $x_n = (-1)^n/n$ to show that $\lim_{x \rightarrow c} f(x)$ is undefined.

Extra problem B: Suppose that f is continuous at c and satisfies $f(c) > 0$. Show that there exists $\delta > 0$ such that $f(x) > 0$ for all x in $V_\delta(c)$.

Extra problem C: Fill in the details of the part of Abbott's proof of Theorem 4.3.2 where he shows that (iii) implies (iv).

Note: In your solution to a problem, you may appeal to the results proved on the homework in earlier problem sets or the current problem set (as long as you don't engage in circular reasoning).

Please don't forget to write down **who you worked on the assignment with** (if nobody, then write "I worked alone"), and record **how much time you spent on each problem** (this doesn't need to be exact).