Math 111.17 Fall 2002
Assignment #9

This assignment is due at the beginning of class on **Tuesday, November 5, 2002**. You are encouraged to form study groups and collaborate with others on this assignment. However, the final work you submit must be your own. You must submit all problems that are marked with an asterix (*). YOUR ASSIGNMENT MUST BE STAPLED AND PROBLEM NUMBERS CLEARLY LABELLED. UNSTAPLED ASSIGNMENTS WILL NOT BE ACCEPTED!

1. Practice problems.

- Section 4.3 #7, 11, 25, 45, 47 • Section 4.4 #1, 5, 11, 23

2. * Problems to hand in.

- Section 4.3 #6, 14, 16, 26, 46 • Section 4.4 #4, 6, 10, 12

3. * Let $f(x) = \dfrac{x+3}{\sqrt{x^2+1}}$.

(a) Evaluate $\lim\limits_{x \to \infty} f(x)$ and $\lim\limits_{x \to -\infty} f(x)$.

(b) Use the preceeding result and the fact that

$$f'(x) = \frac{-3x+1}{\sqrt{(x^2+1)^3}} \quad \text{and} \quad f''(x) = \frac{6x^2 - 3x - 3}{\sqrt{(x^2+1)^5}}$$

to sketch the graph of $y = f(x)$. Label all local maximum and minimum points, points of inflection, and asymptotes.