**Math 131A Lecture 6: Homework 3, Due 4/22 in TA session**

In problems 1-3 $(s_n)$ denotes a sequence of real numbers.

1. Show that if $s_n \to s$, then $s_n^3 \to s^3$. Is the converse true?

2. Suppose that the sequence $(s_n)$ is monotone decreasing, in other words $s_1 \geq s_2 \geq ....$ In addition suppose $(s_n)$ converges to $s \in \mathbb{R}$. With these assumptions, prove that the set $E = \{s_1, s_2, ...\}$ has an infimum and that $\inf E = s$.

3. Construct a sequence $(s_n)$ which satisfies the following property:

For any $x \in \mathbb{R}$ and $\varepsilon > 0$, there exists some $N$ such that $|x - s_N| < \varepsilon$.

4-7: 9.4, 9.6, 9.10, 9.12

8-10: 10.4, 10.6, 10.8