

Homework 8 Math 162

February 25, 2009

1. Prove Lemma F from notes. You need to assume that the sequence is also bounded below.

For the next problem you need the notion of limit inferior as discussed in Definition VII in the notes. Again you should assume the sequence S is bounded above and below.

Now define c_n to be the greatest lower bound of the set

$$\{a_n, a_{n+1}, \dots\},$$

and define the $\liminf_{n \rightarrow \infty} a_n$ to be the limit of the sequence c_n .

2. Prove Theorem 12.
3. Let $\{a_n\}$ be the sequence $0, 1, 0, 1, 0, \dots$. Find $\limsup_{n \rightarrow \infty} a_n$ and $\liminf_{n \rightarrow \infty} a_n$.
4. Find a sequence of irrational numbers with a rational limit.