Math 525a - Fall 17 - Homework 9

1. Problem 21 in section 4.1. Note that you have to consider the cases that s and t are ∞ or $-\infty$.

2. Problem 34 in section 4.1.

3. Let x_n be a sequence and suppose there is a number $\overline{x}$ such that for every subsequence x_{n_k} there is a sub-subsequence $x_{n_{k_j}}$ such that

$$\lim_{j\to\infty} x_{n_{k_j}} = \overline{x}$$

Prove that the sequence x_n converges to $\overline{x}$. Hint: prove it by contradiction.

4. Prove that a subset S of reals is compact if and only if every sequence in S has a convergent subsequence whose limit is in S.

5. (This problem is worth a total of 10 points.) For the following problems the answers are in the back of the book. You should justify your answer. All of these are in section 4.3

problem 8: parts e,h
problem 10: part b
problem 15: part b,f
problem 18: parts b,d
problem 19: a,c