

Homework due Friday, October 4, by 11:59 pm Pacific Time.

Rudin, Chapter 1 (page 21), problems 1, 4, 5, 7(abc), 6, 7(defg).

But in 6(c) change the definition of $B(x)$ to require $t < x$ (instead of $t \leq x$). To solve 6(c), apply 7(c) in the manner suggested by 7(e). This change to the definition of $B(x)$ makes 6(d) easier to solve.

A. Let

$$E = \left\{ \frac{3n - 7}{10n} : n \in \mathbb{N} \right\}.$$

Compute $\sup E$ and $\inf E$. Justify your answer.

B. Let S and T be two bounded subsets of the real numbers. Prove that

$$\sup(T \cup S) = \max\{\sup T, \sup S\}.$$