

Math 131A, problem set 02
Outline due: Wed Sep 03
Completed version due: Mon Sep 08
Last revision due: Fri Sep 19

All problem numbers refer to Bartle and Sherbert.

Problems to be done but not turned in: (2.2) 1, 3, 6, 10, 11; (2.3) 1, 3, 4, 9, 11.

Problems to be turned in:

1. (2.2) 2.
2. (2.2) 5.
3. Find all $x \in \mathbf{R}$ such that $12 > |x - 2| + |x + 3| > 8$. Show all your work.
4. Let a , b , and ϵ be real numbers such that $\epsilon > 0$ and $b \in V_\epsilon(a)$. Prove that there exists a real number $\delta > 0$ such that $V_\delta(b) \subseteq V_\epsilon(a)$. (Suggestions: Draw a picture; review subset containment proofs.)
5. Let $S = \{x \in \mathbf{R} \mid 0 \leq x < 8\}$.
 - (a) Find the value of $\inf S$. Prove your answer.
 - (b) Find the value of $\sup S$. Prove your answer.
6. Let S be a bounded subset of \mathbf{R} , and let T be a nonempty subset of S .
 - (a) Prove that T is bounded above.
 - (b) Prove that $\sup S \geq \sup T$.