

Math 319/320 Worksheet 4

Name:

ID:

Problem 1. Find all $x \in \mathbb{R}$ that satisfy the following inequality:

(a) $|x| + |x + 1| < 2$

(b) $4 < |x + 2| + |x - 1| < 5$

Problem 2. Assume that A and B are bounded subsets of \mathbb{R} .
(a) Show that $A \cup B$ is a bounded subset of \mathbb{R} .

(b) Show that $\sup(A \cup B) = \sup\{\sup A, \sup B\}$.

Problem 3. Show that nonempty finite subset S always has a supremum and that it contains it. (Hint: Use Mathematical Induction.)

Problem 4. Let S be a subset of \mathbb{R} that is bounded below. Show that $\inf S = -\sup\{-s \mid s \in S\}$.