

**MATH 401 INTRODUCTION TO ANALYSIS-I,
FALL TERM 2009, PROBLEMS 6**

Return by Monday 5th October

1. Sketch the set of pairs (x, y) which satisfy $4|x| + 2|y| = 6$.
2. Decide in each of the following cases whether or not the given set is bounded above. For those which are bounded above give three different upper bounds including the smallest one.
(i) $\{-7, 0, 2, 6, 8, 19\}$, (ii) $[-2, \infty)$, (iii) $(-\infty, 4)$, (iv) $[1, 2]$, (v) $(3, 4)$.
3. Give an example of a set which has least upper bound 2 but contains no element x satisfying $x < 2$.
4. Let $\mathcal{A} = \{x : x + x^2 < 0\}$. Prove that this set is non-empty and bounded above. What is the least upper bound? Is it bounded below?