

Please explain briefly but clearly your reasoning (unless it is totally obvious from your answer, i.e., when you have to list the elements of a set or to draw a set in the plane).

Please write the problems in the same order as they are given in the assignment.

Note that the odd-numbered problems have answers at the end of Hammack's book. I strongly suggest that you do *all* odd-numbered problems for practice; moreover, many of them are very similar to the assigned homework problems.

Hammack, Chapter 10: Exercises 4, 8, 10, 12, 26.

Additional Problem 1.

- (a) Give a detailed proof of the fact that

$$\overline{A_1 \cup A_2} = \overline{A_1} \cap \overline{A_2} .$$

At each non-trivial step, please indicate which definition or property was used.

- (b) Use strong induction to prove that, for any integer $n \geq 2$,

$$\overline{A_1 \cup A_2 \cup \cdots \cup A_n} = \overline{A_1} \cap \overline{A_2} \cap \cdots \cap \overline{A_n} .$$