MAT 305
Assignment 11
Thursday, November 29, 2012

For full credit on these problems, each must be submitted with a complete and clear solution, showing all of your work. You may work with other classmates on these problems, but please indicate on your assignment if you received help. Partial answers and incomplete solutions may be eligible for some partial credit, depending on the level of completeness and demonstrated understanding.

1. Using the methods of section 5.1, prove that if A and B are finite sets, then $\overline{A \cup B} = \overline{A} + \overline{B} - \overline{A \cap B}$

2. Prove that if $x \in \mathbb{N}_k$, then $\mathbb{N}_k - \{x\} \approx \mathbb{N}_{k-1}$.

3. State whether each of the following is true or false, and provide a reason for each.

   (a) If a set A is countable, then A is infinite.

   (b) If a set A is denumerable, then A is countable.

   (c) If a set A is finite, then A is denumerable.

   (d) If a set A is uncountable, then A is not denumerable.

   (e) If a set A is uncountable, the A is not finite.

   (f) If a set A is not denumerable, then A is uncountable.

4.