Math 301: Homework 9

Mary Radcliffe

due 23 Nov 2015

Complete the following problems. Fully justify each response.

1. Prove Dilworth's Theorem using Hall's Theorem.

2. Complete problems 9 & 14 from Applied Combinatorics on page 125 (figure 6.18 is on page 126).

3. Let A be a set of natural numbers, having size n. Prove that there exists a subset $S \subset A$ having $|S| \geq \sqrt{n}$ such that one of the two properties below is true.

   - For every distinct $x, y \in S$, either $x|y$ or $y|x$.
   - Every pair of distinct $x, y \in S$ are mutually indivisible.