

CS 2800: Discrete Structures

Homework 9

Due Monday, November 5, 2012

Please write your netid in sufficiently large font on the upper right corner of all pages. Grading for all problems will be based on neatness, style, and correctness.

1. Use the principle of inclusion and exclusion to determine the number of integers between 1 and 1000 not divisible by 2, 3, 5, or 7.
2. If there are 13,000 undergraduate students at Cornell, how many must have the same birthday? That is, born the same day of the same month.
3. How many Boolean functions of n variables?
4. How many ways can one write seven as the sum of a sequence of four nonnegative integers? $1+2+3+1$ and $1+1+2+3$ count as distinct sequences.
5. Given 100 boxes some of which have paint spots as listed below how many boxes have no paint spots?
 - (a) 40 with some red paint
 - (b) 60 with some blue paint
 - (c) 10 with some black paint
 - (d) 30 with some red and some blue
 - (e) 5 with some red and some black
 - (f) 5 with some blue and some black
 - (g) 2 with some of all three colors