Basic Combinatorics

Math 40210, Section 01 — Fall 2012

Homework 3 — due September 14

General information: Homework is an essential part of your learning in this course, so please take it very seriously. It is extremely important that you keep up with the homework, as if you do not, you may quickly fall behind in class and find yourself at a great disadvantage during exams.

You should treat the homework as a learning opportunity, rather than something you need to get out of the way. Reread, revise, and polish your solutions until they are correct, concise, efficient, and elegant. This will really deepen your understanding of the material. I encourage you to talk with your colleagues about homework problems, but your final write-up must be your own work.

You should present your final homework solutions clearly and neatly. Keep in mind that when you write a homework solution, you are trying to communicate the solution to someone other than yourself, so incomplete sentences and personal shorthand is not helpful!

Due to manpower issues, I will only grade selected homework problems, but I plan to quickly post solutions to all the problems soon after I've collected them up.

Reading:

- Section 1.3.3

- Section 1.3.4 (not the proof of Theorem 1.9)

- Intro to Section 1.4

- Section 1.4.1

- Section 1.4.2

- Slides on the course webpage about Prüfer codes

Problems:

- Section 1.3.3: 1, 2, 4, 5 (for question 1, you should give a direct (and preferably very short proof), without using Kruskal's algorithm; for question 4, here is the definition of a bridge in a graph: it is an edge in a connected graph whose deletion disconnects the graph)

- Section 1.3.4: 1, 2, 3, 4, 5, 6, 7 (question 7 is quite tricky)

- ~~Section 1.4.2: 2, 4, 5, 7~~ (moved to next homework)