The University of Sydney
School of Mathematics and Statistics

Quiz 1 Information

MATH2069/2969: Discrete Mathematics and Graph Theory — Semester 1, 2009

Time: 1.05–1.50pm, Thursday April 2, 2009
Place: Teachers' College Assembly Hall 300
Information:

1. Be at the room by 1.05pm and take a seat. The quiz papers will be face down on the desks; you will be told when you may begin (as soon as possible after 1.05pm).

2. No books or materials are permitted, so all you need to take out from your bags is a pen, a calculator (if you want – you may not need it) and your student ID card. Answers written in pencil will not be marked.

3. There will be plenty of blank space and room on the quiz paper to do working, but only the answers (to be written in the boxes provided) will be marked. Extra scrap paper will be available on request.

4. The questions will be of the same kind as those in the practice classes. This includes questions asking you to repeat crucial principles or give definitions of key objects. There will also be some true/false questions.

5. Numerical answers can be left unevaluated (as long as the expression is closed and short enough to fit in the answer box), e.g. $\binom{4}{2}$ would be sufficient instead of 6.

6. The quiz is 45 minutes long. If you wish to leave early, you may do so after 15 minutes have elapsed. No latecomers will be admitted after this time. No-one may leave in the final 5 minutes.

7. At the conclusion of the quiz you will be asked to stop writing, and remain in your seats while your papers are collected.

Material to be covered: the content of Chapter 1 (Counting Problems) and Chapter 2 (Recursion and Induction) in the notes "Topics in Discrete Mathematics". This was covered in the first ten lectures and Practice Classes 1–3 and the first page of Practice Class 4. In particular, you should revise the following concepts:

> Fundamental counting principles, counting injective/surjective functions, ordered/unordered selections with repetition allowed or not allowed, binomial coefficients, multinomial coefficients, Inclusion/Exclusion Principle, Stirling numbers, recursive sequences, Fibonacci sequence, Catalan numbers, mathematical induction, homogeneous linear recurrence relations, characteristic polynomial, nonhomogeneous linear recurrence relations, particular solution, general solution

Predominantly the quiz questions will be at the un-starred level of difficulty.