MAT 375
Main Topics for Test 2
(Sections 5.1 – 5.5, 6.1)

Test date: Tuesday, November 15

Enumeration Problems

Be able to solve enumeration problems by doing these three things:

- give a brief explanation in words of your counting strategy or method,
- show the structure of the calculation before simplification, and
- calculate the final number (or probability) using Maple or a calculator.

Be able to properly apply these counting methods:

- the Addition Principle
- the Multiplication Principle
- the formula for r-permutations of n different objects, P(n,r)
- the formula for r-combinations of n different objects, C(n,r)
- arrangements with repetition (the TENNESSEE Problem)
- selections with repetition (the Milkshake Problem)
- distributions of r different objects into n different boxes
- distributions of r different objects into n different boxes with r_i objects in box i
- distributions of r identical objects into n different boxes (and equivalent formulations as selection or integer-solution-to-equation problems)
- distributions of different objects into different boxes, where order within a box matters (the Flagpole Problem)
- generating functions (including setting up the generating function and calculating the desired coefficient with Maple)

Also be able to:

- restate a combinatorial problem using equivalent models
- compose a combinatorial problem of a specified type
- construct proofs of binomial identities by "committee selection' and by "block-walking"