

# Probability (MATH 4733 - 01) Fall 2011

## Homework 4

Due: Wed. Sep. 21, start of class

**Instructions:** Please read the homework policies and guidelines posted on the course webpage. You may **not** use a calculator (or computer). Make sure to write your name and course number in the top right corner of your solution set, as well as the assignment number on top. Please staple your homework. Sections and exercises refer to the exercises in the required course text.

### Reading

Read Sections 2.6, 2.7

### Conceptual questions

★ What is the difference a permutation and combination?

### Written Assignment

Total: 100 points. Each problem is worth 10 points unless otherwise noted.

**Section 2.6:** 2 (5 pts), 17 (5 pts), 24, 26, 50, 51, 53

**Section 2.7:** 1, 4, 10, 11

**Bonus.** Let's say you have an  $m \times n$  grid of  $mn$  aristocrats (1 aristocrat per square). Each aristocrat faces 1 of 4 directions, i.e., one of the 4 adjacent grid squares. The aristocrats are a social bunch, so at any given time, in any  $2 \times 2$  subgrid of adjacent squares, at least one of those 4 aristocrats is facing one of the other 3.

They are also a fickle bunch, so every time you look, they seem to be facing different ways (but they're also lazy, so they don't leave their squares).

How many different configurations of aristocrats are there in a

- (i)  $2 \times 2$  grid?
- (ii)  $2 \times 3$  grid?
- (iii)  $3 \times 3$  grid?

**Reminder: Exam 1 is on Wed. Sep. 28.**