

Information for Final Exam - Math 100, Spring 2015

Where and when: May 11, usual classroom, 2:15-4:15

What you need: Pencil or pencils, Student ID. *SERIOUSLY, DON'T FORGET THESE!*

You WILL be permitted to use a calculator (!) (but not any other electronics, including smartphones or smartwatches).

The exam is OPEN BOOK and OPEN NOTES.

Form: Multiple choice in two parts:

Part I: New Material This will be 15-20 problems on probability, statistics, and a little combinatorics. See below.

Part II: Old Material This will be a 15 problem exam on earlier material. The exact make-up of the exam is described below.

Scoring: The Part I section will be marked as a normal midterm. If that is the only part you choose to do, or if you do badly on the second part, then this part will be weighted the same as the other midterms, and Part II will not count at all.

I will then include Part II, combine the two scores, and weight this combined exam as 1.5 midterms. If this gives you a better semester grade than the grade from Part I alone, then that will be your grade. Since it is optional and can only help your grade, Part II is a form of extra credit.

Coverage - Part I:

1. Combinatorics(10.3): Approximately 20% of exam. 2-3 problems, at least one word problem; see problems at the end of Section 10.3 for examples.
2. Probability (11.1-3): Approximately 45% of the exam. 8-13 problems, as follows:
 - 1-2 problems** Basic concepts
 - 2-3 problems** Computing probabilities of simple events by counting when elements of the sample space are equally probable
 - 1-2 problems** Odds ratios

- 2-3 problems** Probabilities of more complicated events
- 2-3 problems** Mutually exclusive and independent events
- 3. Data description (12.1-3) Approximately 34% of the exam. 4-8 problems, as follows:
 - 1-2 problems** Stem-leaf plots and Histograms
 - 2-3 problems** Measures of central tendency (mean, median) and dispersion (standard deviation, range, boxplot)
 - 2-3 problems** Interpreting data (general questions based on lectures etc.)

Coverage - Part II:

- 2 problems** Set Operations
(Typical: Section 2.3 problems 19-23, 50-51, 89-91, 96, 102-103, 113-115, 136)
- 2 problems** Logic; 2 problems requiring you to build or interpret truth tables; possibly including a problem using TTs to determine if two statements are equivalent or to test an argument.
(Typical: Section 3.2 problems 42-43, 46, 56-67; Section 3.3 problems 63-4, 83, 90 Section 3.6 problems 17, 21, 32)
- 1 problem** Number Systems: 1 problem on decimal representations of numbers (such as a problem converting a repeating decimal to a fraction or a problem on rational vs. irrational numbers)
(Typical: Section 6.3 problems 78, 81, 90, 91, 99; Section 6.4 problems 4-7)
- 2 problems** Modular Arithmetic: 1 problem general modulo arithmetic; 1 problem solving a modular arithmetic equation $ax \equiv b \pmod{n}$
(Typical: Section 4 extension problems 53-6; 27-30; see also the extra exercises and review sheets from Exam 3)
- 2 problems** Voting: 2 Problems deciding the winner of an election using Hare, Pairwise Comparison, or Approval Voting
(See review sheet for Exam 3)
- 2 problems** Rational Choice: 2 problems dividing goods by sealed bid or lone chooser or method of markers
(See review sheet and extra exercises from Exam 4)
- 2 problems** Other/general/concept questions: might be on golden ratio or fibonacci; might be on RSA; might be on the nature of proof.
- 2 more problems** (Of the same sort as above, to bring the total to 15)