Lecture #39 12/09/2016

* Today is the last class of MAT 118.
Hope it was useful for understanding how to solve some real-life problems

* FINAL will take place on Wed, Dec. 14, 8^{30} - 11^{00} PM
in the same class, where we had lectures.

* There will be a review session on Mon, Dec. 12, 6^{00} - 7^{30} PM
at Frey Hall 201

* Last Office hour will be held on Mon, Dec 12, 10^{00} - 11^{00}

Material we covered

- Section 1: "Mathematics of elections"
You should know 4 voting methods: plurality, Borda count, plurality-with-elimination, pairwise comparison.

- Section 2 (only §2.1, §2.2): "Mathematics of power"
You should know basic concepts (from Section 2.1) and know how to compute the Banzhaf power distribution.

- Section 3: "Mathematics of Sharing" (only §3.1 - 3.4)
You should know the basic concepts (from Section 3.1) and how to apply the Divider-Chooser, Lone-Divider, Lone-Chooser methods.

- Section 5: "Mathematics of Getting Around"
Know: (1) Basics of graph theory, incl. paths & circuits (Section 5.2)
(2) Euler's Theorems and Fleury algorithm
(3) (Semi)eulerizations of graphs

Lecture #39 12/09/2016

- Section 6: "Mathematics of Touring"

Know: (1) What is a TSP and the relation to Hamiltan paths and circuits
(2) The Brute-Force Algorithm
(3) Approximate algorithms: nearest-neighbor, repetitive nearest-neighbor, cheapest-link.

- Section 7: "Mathematics of Networks"

Know: (1) What it is about and how to interpret via spanning trees.
(2) Trees, spanning trees, MST, Max ST, counting spanning trees.
(3) Kruskal's algorithm for finding MST and Max ST.

- Section 9: "Population Growth Models"

Know: (1) Sequences, explicit / recursive f-las determing sequences.
(2) Linear Growth model: recursive and explicit f-las.
(3) Exponential Growth model: -//-
(4) Arithmetic Sum and Geometric Sum formulas
(5) Logistic Growth model: only recursive formula.

- Section 10: "Financial Mathematics"

Know: (1) Percentages (%), converting % to decimals.
(2) Simple Interest formula
(3) Compound interest: annual, monthly, daily, etc; Continuous
(4) APR vs APY.
(5) Computation of Credit Card Debt.
(6) Amortization Formula (e.g. financing)

Lecture #39 12/09/2016

- Section 11 (only § 11.1 – 11.4): "Rigid Motions"

  Know: (1) Basics of rigid motions: equivalent, fixed point, image, (im)proper.
  (2) Reflections, Rotations, and Translations.
  (determine the image of a given figure).

- Section 13: "Fibonacci numbers and Golden ratio"

  Know: (1) Fibonacci numbers: recursive formula
  (2) Two Binet's formulas – explicit formulas for F_n.
  (3) Golden ratio ϕ, divine proportion, golden property.
  (4) Similarity of figures; Gnomons; Golden and Fibonacci Rectangles
  (5) Spiral Growth

- Section 16: "Probabilities, Odds, and Expectations"

  Know: (1) Sample Spaces and Events
  (2) Multiplication Rule, Permutations, Combinations
  (3) Probability assignment, equiprobable spaces, complementary events, odds
  (4) Weighted average and expected value
  (5) Measuring Risk

Good luck at the Final!