

Math 181 - List of topics for Hour Exam 3

This covers the lectures between Monday, 3rd of November, and Monday, 1st of December. It covers all of chapter 11 and some of chapter 13. Obvious comments apply: you should recognise, understand, and be able to work with the concepts below. You should be familiar with the material from the lectures, quizzes, and homeworks.

Weighted Voting systems

Weighted voting systems. Quota and conditions on quota. Dictator. Dummy voter. Voter with veto power. Winning coalitions. Blocking coalitions. Permutations. Pivotal voters. Shapley-Shubik power index. Shapley-Shubik power index for small number of voters. Shapley-Shubik power index with many voters (where most have the same number of votes). Counting permutations using factorials or fundamental principle of counting. Winning Coalitions. Blocking coalitions. Critical voters. Extra votes. Extra votes and critical voters. Winning coalition with X critical and the dual blocking coalition with X critical. Banzhaf power index with a small number of voters. Banzhaf power index with many voters (where most have the same number of votes). Combinations. Calculating combinations. Rules for combinations. Using combinations to count winning coalitions where X is critical. Banzhaf versus Shapley-Shubik. We did not cover equivalent voting systems - end of chapter 11.

Fair division

Fair division. Different people's evaluations of objects and of divisions. What does person A think of what person A receives? What does person A think of what person B receives? Proportionality. Envious or envy-free. Equitable. Pareto-optimal. Adjusted winner procedure for two-people. Its advantages. Divide-and-choose. Rules and strategies. If you know what the other person is thinking? If you do not know what the other person is thinking? Cake-division. Lone-divider procedure.