

Math in Modern Society

Test 1

List of Topics Covered

Prasad - Section 003

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This is just a list of the basics! You want to know these topics, but also you need to have a deeper understanding in order to do well on this test. You should work through the extra practice problems on D2L, and look on MyMathLab for more study questions.

1 Chapter 1 - Voting

1. Know all four voting methods we discussed in class.
2. Know all four fairness criteria, what it means to satisfy or violate them.
3. Know the difference between voting methods and fairness criteria.
4. Know how many ways there are to rank N candidates.
5. Know how many head-to-head comparisons between N candidates.

2 Chapter 2 - Power

1. Know the notation we use for weighted voting systems.
2. Know how to find dictators, dummies, or players with veto power, and be able to provide examples of voting systems that have any of the above.
3. Be able to calculate a Banzhaf power distribution.
4. Be able to calculate a Shapley-Shubik power distribution.
5. Know the difference between a coalition and a sequential coalition - and know how to calculate numbers of each.

3 Chapter 3 - Apportionment

1. Know how to calculate apportionment using Hamilton's method.
2. Know the paradoxes that Hamilton's method is vulnerable to, and how to identify these paradoxes.
3. Know the differences between Jefferson's, Adams', Webster's and Huntington-Hill methods.
4. Know the quota rule, and which methods violate it, and how.
5. Know how to calculate arithmetic and geometric means, and know the difference between them.