Math 1007 Summer 2025
Mathematics and Politics
Homework 1
Due Wednesday, July 2

Name:

(1) Do *The Mathematics of Politics* problem problem 1.2

(2) Consider the profile

A	B	A	B	A	B	A	A	B	B	B	A	B	B	B	A	A	B	B	A

  (a) Who wins under the simple majority method?

  (b) Who wins under a supermajority method with $p = .7$?

  (c) Who wins under the dictator method if the eighth voter is the dictator?

  (d) Who wins under the status quo method where A is the status quo if we use the parity method as our base method?

(3) Consider the profile

B	A	B	A	B	A	A	B	B	A	A	B	A

  (a) Who wins under the simple majority method?

  (b) Who wins under a weighted voting method where the first five voters get three votes each and the rest get one vote each?

  (c) Who wins under a weighted voting method where the first five voters get ten votes each and the rest get nine votes each?

  (d) Who wins under the all-ties method?

(4) Read about Bloc Voting in the textbook or the online notes. Consider the bloc profile with five blocks:

A	A	A	B	B	B	B	A	A	A	A	B

(a) Who wins under the simple majority method?

(b) Who wins if each bloc gets one vote?

(c) Who wins if each bloc gets a number of votes equal to the size of the bloc?

(d) We got very lucky in being able to answer the previous two questions. Which of these five blocs is likely to cause a problem unless I specify more information?

(5) Do *The Mathematics of Politics* problem 1.6

(6) Do *The Mathematics of Politics* problem 1.8

(7) Pick three methods we discussed in class, other than the simple majority method, and explain a reason you might prefer each one to the simple majority method.

(8) Which method is more likely to be useful: the all-ties method, or the parity method? Why?