

Math 1007 Spring 2026  
Mathematics and Politics  
Homework 4      Due on Blackboard  
Tuesday, February 10 at 4:45 PM

**Name:**

Make sure to explain why all your answers are correct! Remember that you should be making short persuasive arguments. (This explanation can take the form of showing calculations, or of a couple sentences of writing, depending on the question.)

- (1) Show that Coombs's method is not monotone or independent. (Hint: look at our proofs for Hare's method.)
- (2) Do *The Mathematics of Politics* problem 4.2
- (3) Do *The Mathematics of Politics* problem 4.6
- (4) In a *sequential agenda* method, head-to-head contests are conducted between the candidates following a fixed order.

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In each round, the candidate who wins advances to the next round and faces the next candidate on the agenda.

Consider the tabulated profile

7	5	6
A	B	C
B	C	A
C	A	B

- (a) What happens if the agenda starts with  $A$  facing  $B$ , and then the winner faces  $C$ ?
- (b) What happens if the agenda starts with  $A$  facing  $C$ , and then the winner faces  $B$ ?
- (c) What happens if the agenda starts with  $B$  facing  $C$ , and then the winner faces  $A$ ?
- (d) Is this method (in general) neutral? Why or why not?
- (e) Is this method (in general) Condorcet? Why or why not?