

Intro to Contemporary Math

Voting Review

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Agenda

- ▶ Exam Format
- ▶ Review

WebWork

- ▶ The fourth homework assignment (HW3) is due tonight.

Exam Format

Two parts:

- ▶ 16 Multiple Choice questions
 - ▶ No partial credit
 - ▶ Record answers on front page of exam
- ▶ Short Answer (SA) questions
 - ▶ Length of SA is about same as mini-exam

What to Expect

- ▶ Know how the various voting methods work.
- ▶ Know what the fairness criteria are and how to test if they are satisfied or violated.
 - ▶ For each criterion, know what it means to violate or always satisfy it.

MC Example 1

In the preference schedule, which columns give Candidate A 2 Borda points per vote?

A	A	B	B	C	C
B	C	A	C	A	B
C	B	C	A	B	A

- a) Columns 1 and 2
- b) Columns 3 and 4
- c) Columns 3 and 5
- d) Columns 4 and 6
- e) Columns 5 and 6

MC Example 1

In the preference schedule, which columns give Candidate A 2 Borda points per vote?

A	A	B	B	C	C
B	C	A	C	A	B
C	B	C	A	B	A

- a) Columns 1 and 2
- b) Columns 3 and 4
- c) Columns 3 and 5
- d) Columns 4 and 6
- e) Columns 5 and 6

MC Example 2

If Candidate A is eliminated, which column will give C additional first place votes?

A	A	B	B	C	C
B	C	A	C	A	B
C	B	C	A	B	A

- a) Column 1
- b) Column 2
- c) Column 3
- d) Column 4
- e) No column

MC Example 2

If Candidate A is eliminated, which column will give C additional first place votes?

A	A	B	B	C	C
B	C	A	C	A	B
C	B	C	A	B	A

- a) Column 1
- b) Column 2**
- c) Column 3
- d) Column 4
- e) No column

MC Example 3

In the A vs. B comparison, how many voters would be in A's camp?

3	5	1	2
A	B	C	B
B	C	A	A
C	A	B	C

- a) 2
- b) 3
- c) 4
- d) 6
- e) 7

MC Example 3

In the **A** vs. B comparison, how many voters would be in **A**'s camp?

3	5	1	2
A	B	C	B
B	C	A	A
C	A	B	C

a) 2

b) 3

c) 4

d) 6

e) 7

MC Example 4

An election with four candidates A, B, C, and D was won by Candidate D. A ballot that originally had D in last place was changed during testing for compliance with the Monotonicity criterion. The new ballot reads D, B, A, C. Which of these is the original ballot before the change?

- a) A, B, C, D
- b) B, C, A, D
- c) C, A, B, D
- d) B, A, C, D
- e) B, A, D, C

MC Example 4

An election with four candidates A, B, C, and D was won by Candidate D. A ballot that originally had D in last place was changed during testing for compliance with the Monotonicity criterion. The new ballot reads D, B, A, C. Which of these is the original ballot before the change?

- a) A, B, C, D
- b) B, C, A, D
- c) C, A, B, D
- d) B, A, C, D**
- e) B, A, D, C

MC Example 4 (Explanation)

Ballot changes must preserve the order of the losing candidates. Since the new ballot reads D, B, A, C, the correct choice must have B before A, and A before C.

SA Example: Testing Criteria

The following election uses an unknown method. You will use this election to test this method against the MA criterion.

1	2	2	4
B	A	C	B
A	C	B	C
C	B	A	A

- ▶ Which candidate got over 50% of the first place votes?
Press the candidate's letter.

SA Example: Testing Criteria

1	2	2	4
B	A	C	B
A	C	B	C
C	B	A	A

- ▶ Candidate B got over 50% (5 out of 9) first place votes. That makes Candidate B the **majority candidate**.

SA Example: Testing Criteria

► If A is the winner, does this test show:

- a) **violation**
- b) **satisfaction**
- c) (nothing) **inconclusive**

SA Example: Testing Criteria

- ▶ If A is the winner, does this test show:

a) **violation**

B is the majority candidate, but someone else, A, was declared the winner. This violates the MA criterion, which says B should win.

SA Example: Testing Criteria

► If B is the winner, does this test show:

- a) **violation**
- b) **satisfaction**
- c) (nothing) **inconclusive**

SA Example: Testing Criteria

- ▶ If B is the winner, does this test show:

c) (nothing) **inconclusive**

Just because the majority candidate B won this time does not tell us if they can lose in a different election or win in all elections.

Next time

- ▶ The exam is this Wednesday. Bring a calculator that is not a cell phone.
- ▶ The fourth homework assignment is due tonight.