

MA 111  
Fall 2021  
Mini-Exam 1B  
9/3/2021

Full name: \_\_\_\_\_

Student ID number: \_\_\_\_\_

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I want you to do your best on this mini-exam, so I can see how much you've learned. Be sure to read each question carefully and write clearly. Show your work, and explain it where necessary, so you can earn partial credit even on questions where you make a mistake.

This mini-exam contains 3 pages (including this cover page) and 11 questions. Please keep the pages stapled together. The total number of points is 40. You may use a calculator. If you need more space for scratch work, please use the back page.

**Good luck!**

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Consider the following election to answer questions 1 through 6.

10	24	40	36
George	Lamport	Sergei	George
Sergei	Sergei	Victoria	Sergei
Victoria	Victoria	George	Lamport
Lamport	George	Lamport	Victoria

- (2 points) What is the above table of information called?
- (3 points) If we use the **Plurality Method** in this election, who is the winner?
- (2 points) How many first-place votes does a candidate need to be a **majority candidate**?
- (2 points) Is there a majority candidate in this election? If so, who?
- (12 points) Determine the number of Borda points each candidate would receive in a Borda Count election. Show your work to receive partial credit if you make a mistake.
  - (3 points) George received \_\_\_\_\_ Borda points.
  - (3 points) Sergei received \_\_\_\_\_ Borda points.
  - (3 points) Victoria received \_\_\_\_\_ Borda points.
  - (3 points) Lamport received \_\_\_\_\_ Borda points.
- (2 points) Using your results from above, which candidate would win a Borda Count election?

Consider the following election to answer questions 7 through 9.

20	15	11	8	6
Argus	Dollie	Victoria	Robert	Victoria
Robert	Robert	Dollie	Dollie	Argus
Victoria	Victoria	Argus	Victoria	Dollie
Dollie	Argus	Robert	Argus	Robert

7. (3 points) How many first-place votes does a majority candidate need in this election?
8. (3 points) If we use **Instant Runoff Voting** in this election, how many candidates will we need to eliminate before a winner is determined? List the candidates in the order they're eliminated. (Be careful not to eliminate more candidates than you need to.)
9. (3 points) If we use **Instant Runoff Voting** in this election, who is the winner?
10. (4 points) In an election for favorite ice cream flavor between candidates Chocolate, Lemon, and Orange, which ballot type(s) would most help Chocolate become the **majority candidate**? Circle all that apply.

Chocolate	Lemon	Orange	Chocolate	Orange	Lemon
Lemon	Orange	Chocolate	Orange	Lemon	Chocolate
Orange	Chocolate	Lemon	Lemon	Chocolate	Orange

11. (4 points) In an election for favorite ice cream flavor between candidates Chocolate, Lemon, and Orange, which ballot type would help Orange get the most Borda points compared to Chocolate? Circle your answer.

Chocolate	Lemon	Orange	Chocolate	Orange	Lemon
Lemon	Orange	Chocolate	Orange	Lemon	Chocolate
Orange	Chocolate	Lemon	Lemon	Chocolate	Orange