

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

Full name: _____

Student ID number: _____

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!

Consider the following election to answer questions 1 through 6.

| | | | |
|--------|--------|--------|--------|
| 36 | 40 | 24 | 10 |
| Fred | Leslie | Julio | Fred |
| Julio | Julio | Claire | Julio |
| Claire | Claire | Fred | Leslie |
| Leslie | Fred | Leslie | Claire |

- (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) Fred received _____ Borda points.
 - (3 points) Julio received _____ Borda points.
 - (3 points) Claire received _____ Borda points.
 - (3 points) Leslie 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 |
| Nate | Essie | Claire | Wesley | Claire |
| Wesley | Wesley | Essie | Essie | Nate |
| Claire | Claire | Nate | Claire | Essie |
| Essie | Nate | Wesley | Nate | Wesley |

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 Vanilla, Oreo, and Mint, which ballot type(s) would most help Vanilla become the **majority candidate**? Circle all that apply.

| | | | | | |
|---------|---------|---------|---------|---------|---------|
| Vanilla | Oreo | Mint | Vanilla | Mint | Oreo |
| Oreo | Mint | Vanilla | Mint | Oreo | Vanilla |
| Mint | Vanilla | Oreo | Oreo | Vanilla | Mint |

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

| | | | | | |
|---------|---------|---------|---------|---------|---------|
| Vanilla | Oreo | Mint | Vanilla | Mint | Oreo |
| Oreo | Mint | Vanilla | Mint | Oreo | Vanilla |
| Mint | Vanilla | Oreo | Oreo | Vanilla | Mint |