This page left intentionally blank

MA111-008 Exam1

Name:

	Alex	Blair	Casey	Devin	Emerson	Gabrielle	Lee	Marcus	Taylor
1st	Ovid's	Ovid's	Ovid's	Ovid's	Subway	Subway	Fazoli's	Fazoli's	Panera
2nd	K-Lair	K-Lair	K-Lair	K-Lair	Panera	Panera	Subway	Subway	K-Lair
3rd	Fazoli's	Fazoli's	Fazoli's	Fazoli's	Fazoli's	Fazoli's	Panera	Panera	Subway
4th	Panera	Panera	Panera	Panera	K-Lair	K-Lair	Ovid's	Ovid's	Ovid's
5th	Subway	Subway	Subway	Subway	Ovid's	Ovid's	K-Lair	K-Lair	Fazoli's

1. (a) Convert this set of ballots into a preference schedule.

(b) How many voters are needed to form a majority in this election?

(c) If you eliminate Panera, what does the new preference schedule look like?

(d) In a Fazoli's versus Panera head-to-head matchup, whose votes does each restaurant get?

(e) Name one restaurant that is NOT a Condorcet winner. Explain why.

- 2. Here is a preference schedule.
- (a) Show work: Who wins using plurality?

	4	2	2	1
1st	0	S	F	Р
2nd	Κ	Р	\mathbf{S}	Κ
3rd	F	F	Р	\mathbf{S}
$4 \mathrm{th}$	Р	Κ	Ο	Ο
5th	S	Ο	Κ	F

(b) Show work: Who wins using plurality with elimination?

(c) Show work: Who wins using pairwise comparison?

(d) Show work: Who wins using Thomas's rule = Borda count?

(e) Show work: Who wins using Daisia's rule?

3. (a) Plurality declares Ovid's the winner of this election. Which fairness criterion does this violate and why?

	3	2	2
1st	Ovid's	K-Lair	Subway
2nd	K-Lair	Subway	K-Lair
3rd	Subway	Ovid's	Ovid's

(b) Plurality declares Ovid's the winner of the top election, but K-Lair the winner of the bottom election. Which fairness criterion does this violate and why?

		4		3	2
1st	O	vid's	Sı	ıbway	K-Lair
2nd	Su	bway	K	K-Lair	Ovid's
3rd	K-	K-Lair)vid's	Subway
		4		3	2
	1st	Ovid	\mathbf{s}	K-Lai	r K-Lair
	2nd	K-La	ir	Ovid's	s Ovid's

(c) Plurality with Elimination declares Ovid's the winner of the top election, but Subway is the winner of the bottom election. Which fairness criterion does this violate and why?

	Jordan	Jared	6 more	5	4
1st	Subway	Subway	Subway	Ovid's	K-Lair
2nd	Ovid's	Ovid's	Ovid's	Subway	Ovid's
3rd	K-Lair	K-Lair	K-Lair	K-Lair	Subway
	Jordan	Jared	6 more	5	4
1st	K-Lair	K-Lair	Subway	Ovid's	K-Lair
2nd	Ovid's	Ovid's	Ovid's	Subway	Ovid's
3rd	Subway	Subway	K-Lair	K-Lair	Subway

4. (a) Construct an example of a preference schedule where plurality disagrees with one of the other methods [name the other method, say who won both methods, and explain "how" you figured out your example].

(b) Pick one of the fairness criteria we discussed in class. Explain what it means and name one voting method that violates it.

(c) Why is a restaurant with more than half of the first place votes always a Condorcet winner?

MA111-008 Exam 1

Name: _____

	Alex	Blair	Casey	Devin	Emerson	Gabrielle	Henry	Ivy	Lee	Marcus	Taylor
1st	K-Lair	K-Lair	K-Lair	K-Lair	K-Lair	Panera	Panera	Panera	Subway	Subway	Fazoli's
2nd	Ovid's	Ovid's	Ovid's	Ovid's	Ovid's	Fazoli's	Fazoli's	Fazoli's	Panera	Panera	Ovid's
3rd	Subway	Subway	Subway	Subway	Subway	Subway	Subway	Subway	Fazoli's	Fazoli's	Panera
$4 \mathrm{th}$	Fazoli's	Fazoli's	Fazoli's	Fazoli's	Fazoli's	Ovid's	Ovid's	Ovid's	K-Lair	K-Lair	K-Lair
5th	Panera	Panera	Panera	Panera	Panera	K-Lair	K-Lair	K-Lair	Ovid's	Ovid's	Subway

1. (a) Convert this set of ballots into a preference schedule.

(b) How many voters are needed to form a majority in this election?

(c) If you eliminate Fazoli's, what does the new preference schedule look like?

(d) In a Subway versus Fazoli's head-to-head matchup, whose votes does each restaurant get?

(e) Name one restaurant that is NOT a Condorcet winner. Explain why.

- 2. Here is a preference schedule.
- (a) Show work: Who wins using plurality?

	5	3	2	1
1st	Κ	Р	S	F
2nd	0	F	Р	Ο
3rd	\mathbf{S}	\mathbf{S}	F	Р
$4 \mathrm{th}$	F	Ο	Κ	Κ
5th	Р	Κ	Ο	\mathbf{S}

(b) Show work: Who wins using plurality with elimination?

(c) Show work: Who wins using pairwise comparison?

(d) Show work: Who wins using Thomas's rule = Borda count?

(e) Show work: Who wins using Daisia's rule?

3. (a) Plurality declares Ovid's the winner of this election. Which fairness criterion does this violate and why?

	3	2	2
1st	Ovid's	K-Lair	Subway
2nd	K-Lair	Subway	K-Lair
3rd	Subway	Ovid's	Ovid's

(b) Plurality declares Ovid's the winner of the top election, but K-Lair the winner of the bottom election. Which fairness criterion does this violate and why?

		4		3	2
1st	O	vid's	Sı	ıbway	K-Lair
2nd	Su	bway	K	K-Lair	Ovid's
3rd	K-	K-Lair)vid's	Subway
		4		3	2
	1st	Ovid	\mathbf{s}	K-Lai	r K-Lair
	2nd	K-La	ir	Ovid's	s Ovid's

(c) Plurality with Elimination declares Ovid's the winner of the top election, but Subway is the winner of the bottom election. Which fairness criterion does this violate and why?

	Jordan	Jared	6 more	5	4
1st	Subway	Subway	Subway	Ovid's	K-Lair
2nd	Ovid's	Ovid's	Ovid's	Subway	Ovid's
3rd	K-Lair	K-Lair	K-Lair	K-Lair	Subway
	Jordan	Jared	6 more	5	4
1st	K-Lair	K-Lair	Subway	Ovid's	K-Lair
2nd	Ovid's	Ovid's	Ovid's	Subway	Ovid's
3rd	Subway	Subway	K-Lair	K-Lair	Subway

4. (a) Construct an example of a preference schedule where plurality disagrees with one of the other methods [name the other method, say who won both methods, and explain "how" you figured out your example].

(b) Pick one of the fairness criteria we discussed in class. Explain what it means and name one voting method that violates it.

(c) Why does a restaurant with more than half of the first place votes always win a plurality election?