Names:

1. Consider the following election.
   a. Who wins using with Plurality with Elimination?

	45	35	20
1st	Gibbs	Tony	McGee
2nd	McGee	McGee	Gibbs
3rd	Tony	Gibbs	Tony

   b. Now we will disqualify one of the losers. For example, who has the most last place votes? Remove that person and find the new winner. Does the winner change from part (a)?

   c. Which fairness criterion were we testing in part (b)? Did our test show a violation, or did the test not apply?

2. In the preference schedule below, suppose **A** wins the election above using a mystery method.

	?	?	?	?	?	?
1st	A	A	B	B	C	C
2nd	B	C	A	C	A	B
3rd	C	B	C	A	B	A

   We want to test whether this voting method violates the Monotonicity Criterion by changing ballots from the **last column**. Which of the following is a valid change to test Monotonicity? (The ballots are listed as 1st, 2nd, 3rd)

   ☐ C, A, B   ☐ A, B, C   ☐ C, B, A   ☐ B, A, C   ☐ none of these

3. The plurality method violates the Condorcet criterion. That means (select one)
   a. It is impossible to have a Condorcet candidate in an election using the plurality method
   b. Condorcet candidates always lose with plurality method
   c. Condorcet candidates can lose with the plurality method
   d. Condorcet candidates are never majority candidates

4. Majority candidates are always (select all that are true):
   a. Losers using the Borda Count method
   b. Winners with Pairwise Comparison
   c. Winners with Borda Count method
   d. Losers with the Plurality with Elimination method
   e. Eliminated first in Plurality with Elimination

5. Suppose we have an election with **seven** candidates, A, B, C, D, E, F, G; and 100 people voting.
   a. How many **pairwise points** would **A** need to be a **Condorcet candidate**?

   b. How many different **possible ballots** are there? (formula and answer)

   c. If we used the Borda count method, what would the total of the Borda points be? (formula)

6. The following election uses an unknown method. You will use this election to test this mystery method against one (or more) of the fairness criteria.

   a. Which candidate got over 50% of the first place votes? What kind of candidate is this?

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

   b. By asking this question, which fairness criteria are we testing? (Can we test more than one?)

   c. Suppose our voting method selects A as the winner. Does this imply our voting method violates a fairness criterion, satisfies a fairness criterion, or that the test doesn't apply?

   d. Suppose our voting method selects B as the winner. Does this imply our voting method violates a fairness criterion, satisfies a fairness criterion, or that the test doesn't apply?

7. Construct an example of an election between Rory, Amy and Clara with 60 voters in which Clara wins by plurality, but Amy wins using plurality with elimination.

8. Construct an example of an election between McDonald's (M), Burger King (B) and Arby's (A) with 60 voters where McDonalds is the winner using Borda count, Burger King wins using plurality, but Burger King is NOT a majority candidate.