Math 17: Exercise Set 1 – Posted 8/27

1. Consider the preference schedule below.

Number of voters	7	5	4	3	2
1st	A	B	B	C	D
2nd	B	D	C	D	A
3rd	C	C	A	B	C
4th	D	A	D	A	B

   (a) Determine the ranking using the Plurality method.

   (b) Determine the ranking using the Borda Count method.

   (c) Determine the ranking using the Plurality with Elimination method.

   (d) Determine the ranking using the Pairwise Comparison method.

2. More of the same (make sure you feel comfortable with this)

Number of voters	6	6	5	4	3	3
1st	A	B	B	D	A	B
2nd	C	C	C	A	B	A
3rd	D	A	D	C	C	C
4th	B	D	A	B	D	D

   (a) Determine the ranking using the Plurality method.

   (b) Determine the ranking using the Borda Count method.

   (c) Determine the ranking using the Plurality with Elimination method.

   (d) Determine the ranking using the Pairwise Comparison method.

3. Consider a variation of the Plurality with Elimination method in which instead of eliminating the candidate with the least number of first place votes we now eliminate the candidate with the greatest number of last place votes. Using this method, who wins the election given the following preference schedule? Show your work.

Number of voters	4	3	2	1	1
1st	A	B	C	D	D
2nd	C	D	B	B	B
3rd	D	C	D	C	A
4th	B	A	A	A	C

4. The *Pareto criterion* is a fairness criterion that says "If every voter prefers candidate X to candidate Y, then X should be ranked above Y in the outcome of the election."

   (a) Explain why the Borda count method satisfies the Pareto criterion.

   (b) Explain why the pairwise-comparisons method satisfies the Pareto criterion.