Math 1116, Quiz #4, Fall 2014 Name KEY

Instructions: Show all work. Answer each question as completely as possible. Use exact values. For counting problems you may use scientific notation (with three significant figures) for any numbers larger than a million.

1. Count the following election.

Rank/# of Votes	150	130	120	100
1st	C	D	B	A
2nd	D	A	C	C
3rd	A	B	A	B
4th	B	C	D	D

a. Use the plurality method to count the votes.

C wins since C has the most first-place votes.

b. Use the method of pairwise comparisons to count the vote.

A-B 150 + 130 + 100 vs. 120 A
A-C 130 + 100 vs. 150 + 120 C
A-D 120 + 100 vs. 150 + 130 D
B-C 130 + 120 vs. 150 + 100 tie
B-D 120 + 100 vs. 150 + 130 D
C-D 150 + 100 + 120 vs. 130 C

A - 1 = 1
B - ½ = ½
C - 1½ = 2½
D - 1 = 2

C wins

c. Use the Borda Count method to count the votes.

A = 2(150) + 3(130) + 2(120) + 4(100) = 1330
B = 1(150) + 2(130) + 4(120) + 2(100) = 1090
C = 4(150) + 1(130) + 3(120) + 3(100) = 1390 ← C wins
D = 3(150) + 4(130) + 1(120) + 1(100) = 1190

d. Is the winner the same in each case? Yes