Math 1116, Quiz #5, 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 with elimination to determine the winner.

$A = 150$ $B = 120$ $C = 150$ $D = 130$
                                    250
                                    370

C wins

b. Use the information obtained from part (a) to extend the rankings to 2nd, 3rd, and 4th place.

$C = 1^{st}$
$D = 2^{nd}$
$B = 3^{rd}$
$A = 4^{th}$

c. Compare the winner of this plurality with elimination method with the plurality method. Is this an independence of irrelevant alternatives violation? Why or why not?

C wins plurality method.
Since losing candidates dropping out of the race did not change the winner, This is **not** an IIA violation

2. Consider an election that resulted in the following preference table.

Place/# of Votes	7	6	5	3
1st	A	B	C	D
2nd	B	A	B	C
3rd	C	C	A	B
4th	D	D	D	A

a. Determine the winner of the election using the plurality with elimination method.

$A = 7$ $B = 6$ $C = 5$ $D = 3$
13   8

A wins

b. But supporters of A find out of the results, and decide to change their votes from D to A as shown in the table below. Recount the election.

Place/# of Votes	7	6	5	3
1st	A	B	C	A
2nd	B	A	B	D
3rd	C	C	A	C
4th	D	D	D	B

$A = 10$ $B = 6$ $C = 5$ $D = 6$
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B wins

c. Is this a violation of a fairness criterion? Which one? Why or why not?

this is a violation of the montonicity criterion.
A won the first round, gained more first
place votes in round 2, but lost the election
anyway.