Math 111 Contemporary Mathematics
Fall 2015
Name: $\qquad$
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In your opinion....Do you Agree or Disagree?
(1) The candidate with the most 1st place votes should win.
(2) The candidate with the most 2nd place votes should win.
(3) Two voters that switch ballots should change the outcome of the election.
(4) A voter who changes their vote should change the outcome of the election.
(5) A winning candidate who gains votes should change the outcome of the election.
(6) A losing candidate who gains votes should change the outcome of the election.
(7) All voters changing their vote should change the outcome of the election.
(1) If these ballots

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | A | A | B | A | B |
| 2nd | B | B | A | B | A |

get changed to these ballots (swapping ballots $2 \& 5$ )

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | A | B | B | A | A |
| 2nd | B | A | A | B | B |

Does the winner change?
(2) If these ballots

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | A | A | B | A | B |
| 2nd | B | B | A | B | A |

get changed to these ballots (ballot 3 changes)

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | A | A | A | A | B |
| 2 nd | B | B | B | B | A |

Does the winner change?
(3) If these ballots

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | A | A | B | A | B |
| 2nd | B | B | A | B | A |

get changed to these ballots (everyone switches their vote)

|  | Ballot | Ballot | Ballot | Ballot | Ballot |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1st | B | B | A | B | A |
| 2nd | A | A | B | A | B |

Does the winner change?
(4) We know by May's Theorem that Majority Rule is the only 2-candidate voting system that is anonymous, neutral, and monotone. Complete the table, determining for each Rule whether or not it satisfies each of the 2-candidate fairness ideas.

| Method | Anonymous | Neutral | Monotone |
| :--- | :--- | :--- | :--- |
| Majority Rule |  |  |  |
| Minority Rule |  |  |  |
| Dictatorship |  |  |  |
| Imposed Rule |  |  |  |

${ }^{* *}$ Note: Keep this worksheet. Problem 4 will be very helpful with Homework 3!

