

## Math 1001 Quiz 4 Solutions

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1. (4 points, 1 point each) True or false.

TRUE The plurality method satisfies the majority criterion.

TRUE The pairwise comparison method satisfies the Condorcet criterion.

FALSE It is possible to have a voting method satisfying all four fairness criteria that have been discussed in class.

FALSE One of the voting methods we've discussed never gives a tie.

The questions below refer to the election whose results are tallied in the following preference table:

7	8	11	9	3
Fish	Boar	Cow	Duck	Fish
Boar	Duck	Duck	Boar	Boar
Duck	Fish	Boar	Fish	Cow
Cow	Cow	Fish	Cow	Duck

2. (2 points) If we use the plurality method to count votes, who wins the election?

**The cow wins.**

3. (3 points) Who wins in a head-to-head comparison between the fish and the duck?

**The duck wins, 28 to 10.**

4. (3 points) If we use a Borda count method, how many points does the cow receive?

**The cow receives  $7 + 8 + 44 + 9 + 6 = 74$  points.**

5. (3 points) If we use the plurality-with-elimination method to count votes, who wins the election?

**The boar is eliminated first, then the fish, then the cow, leaving the duck as the winner.**