

# Quiz 7 Solutions

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Tuesday, February 16, 2016

**This quiz does not count towards your grade.** It exists to simply gauge your understanding. Treat this as though it were a portion of your midterm or final exam. "Intuition Practice" might be tricky; watch out for subtleties. "Proofs" will be challenging to start; develop an arsenal of *approaches* to starting a problem.

## 1 Intuition Practice

The following covers various topics for the midterm.

1. In all stable pairings, at least one man is paired with a woman in the first half of his preference list.  
**False.** It is possible for all men to be paired with their least favorite women.
2. Any graph with an Eulerian tour has at least  $|V| - 1$  edges.  
**True.** An Eulerian is by construction a cycle. Since a tree is minimally connected and acyclic, the graph containing an Eulerian tour must contain more edges than a tree has. Trees have  $|V| - 1$  edges.
3. Among any three vertices  $(u, v, w)$  in a hypercube, there are *exactly*  $2^a + 2^b$  paths connecting them, where all paths between  $u$  and  $v$  are of length  $a$  and all paths between  $v$  and  $w$  are of length  $b$ .  
**False.** There are  $2^{a+b}$ .