

Math777: Graph Theory (II)
Spring, 2018
Homework 4, due Tuesday, March 20, 2018

Select any 5 problems to solve. The total score of this homework is 10 points. You get a bonus point if you solve all 6 problems correctly. You also get another bonus point if your solution is selected as a standard solution (in this case you will be asked to send me the latex code of this solution.)

1. [page 305, #1] An oriented complete graph is called a *tournament*. Show that every tournament contains a (directed) Hamilton path.
2. [page 305, #2] Show that every uniquely 3-edge-colorable cubic graph is hamiltonian. (“Unique” means that all 3-edge-colorings induce the same edge partition.)
3. [page 305, #5] Find a graph that is 1-tough but not hamiltonian.
4. [page 306, #7] Find a hamiltonian graph whose degree sequence is not hamiltonian.
5. [page 306, #9] Prove that the square G^2 of a k -connected graph G is k -tough.
6. [page 306, #11] Find a connected graph G whose square G^2 has no Hamilton cycle.