

Tutorial 2

Advanced Graph Theory

July 30, 2013

1. Prove that a graph G is bipartite if and only if every subgraph H of G has an independent set consisting of at least half of $V(H)$.
2. Let G be a connected simple graph not having P_4 or C_3 as an induced subgraph. Prove that G is a biclique.

3. Prove that every n -vertex graph with at least n edges contains a cycle.
4. Let P and Q be paths of maximum length in a connected graph G . Prove that P and Q have a common vertex.

5. If every vertex of a loopless graph G has degree at least 3, then prove that G has a cycle of even length.