

Math 485 Homework 5
Fall 2007
Due: Friday, October 12

In all the problems, indicate how you arrived at your answer and explain your work.

1. Show that a k -regular bipartite graph (with $k \geq 2$) has no cut-edges.
2. Prove that an edge e of a connected graph G is a cut-edge if and only if e belongs to every spanning tree of G .
3. Let T, T' be two spanning trees of a connected graph G . For $e \in E(T) - E(T')$, prove that there is an edge $e' \in E(T') - E(T)$ such that $T' + e - e'$ and $T - e + e'$ are both spanning trees of G .
4. Let G be a connected simple graph which is not a tree. Show that G has at least three spanning trees.
5. Show that for any graph G , $\text{diam}(G) \leq 2 \cdot \text{rad}(G)$.
6. Find the eccentricity of each vertex in the graph G below. Also, find the diameter and the radius of G .

