Tutorial 9
Advanced Graph Theory

October 9, 2013

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1. Prove that a k-regular bipartite graph, for $k \geq 2$, has no cut edges.

2. If G be simple n-vertex graph. If δ(G)≥ $\left\lfloor \frac{n}{2} \right\rfloor$, then prove that, κ'(G)=δ(G).

3. Let G be the Petersen graph. Show that κ(G) = κ'(G) = 3.

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4. Prove or disprove: If *P* is a *u,v*-path in a 2-connected graph *G*, then there is a *u,v*-path *Q* internally disjoint from *P*.

5. Let G be a *k*-connected graph, and let *S, T* be disjoint subsets of *V(G)* with size at least k. Prove that G has k pairwise disjoint *S, T* paths.