

Graph Theory

Instructor: Oliver Janzer

Assignment 4

Please submit your solution to Problem 1 by the end of October 7th for feedback

Unless noted otherwise, all graphs considered are simple. The solution of every problem should be no longer than one page.

Problem 1: Let G be a graph and suppose some two vertices $u, v \in V(G)$ are separated by $X \subseteq V(G) \setminus \{u, v\}$. Show that X is a minimal separating set (i.e. there is no proper subset $Y \subsetneq X$ that separates u and v) if and only if every vertex in X has a neighbor in the component of $G - X$ containing u and another in the component containing v .

Problem 2: Let $k \geq 1$. Show that if G is a graph with $|V(G)| = n \geq k + 1$ and $\delta(G) \geq (n + k - 2)/2$ then G is k -connected.