

Quiz #3, CS 336, Fall 2009

Instructions: Show all your work.

1. Write in mathematical notation the following assertions about a graph $G = (V, E)$:

- G has an isolated vertex
- G can be partitioned into k different cliques
- G has an independent set of size k .

2. Let the function $F(n, k)$ be defined by:

- $F(n, k) = n + k$ if n or k is 1
- $F(n, k) = F(n - 1, k - 1) + n + k$ if both n, k are greater than 1

Prove that $F(n, k) \leq 2nk$ for all $n \geq 1, k \geq 1$ (where n and k are integers).