

Lots of equivalent theorems

Math 40210, Fall 2012

October 24, 2012

A whole bunch of the same theorem (4 of many)

- 1 **König-Egerváry:** In a bipartite graph, the maximum matching size equals the minimum vertex cover size
(Trivial: max matching size \leq min vertex cover size)
- 2 **Hall:** In a bipartite graph $X \cup Y$, there's a matching saturating X if and only if Hall's condition is satisfied
(Trivial: if there's a matching saturating X , Hall is satisfied)
- 3 **Menger:** In any graph, the greatest number of disjoint paths joining u to v is equal to the smallest number of vertices needed to disconnect u from v
(Trivial: if there are k such paths, at least k vertices are needed)
- 4 **Rooks placed on a chessboard:** The minimum number of rows and columns needed to cover all the rooks equals the maximum number of mutually non-attacking rooks
(Trivial: if there are k non-attacking rooks, at least k rows and columns are needed)