

Exercises for the PhD course Graph Theory

Lecture 11

1. (a) Show that if $|X| = |Y|$ and $d(X, Y) \leq \epsilon^3$ then (X, Y) is ϵ -regular.
(Hence this definition is meaningful only when the density of the pair is sufficiently large.)
(b) Show that any ϵ -regular pair in G is also ϵ -regular in the complement of G .
2. What is the expected number of K_r -subgraphs in $G(n, p)$.
3. Use a random partition of the vertices to prove that every graph has a bipartite subgraph with at least half its edges.