1. Formulate and prove the variant of the Removal lemma for K_4.

2. Prove the following strengthening of the Erdős-Stone theorem: Let H be a graph of chromatic number $c \geq 2$. For every $\beta > 0$, there exists $\gamma > 0$ such that every graph G with n vertices and at least $\left(1 - \frac{1}{c-1} + \beta\right) \frac{n^2}{2}$ edges contains at least $\gamma n^{|V(H)|}$ subgraphs isomorphic to H.

3. Prove that for every $p > 0$ there exist $c, \varepsilon > 0$ such that the following claim holds. Let G be a graph and let (A, B) be an ε-regular pair in G such that $d(A, B) \geq p$. Let $n = |A| = |B|$. Suppose $A' \subseteq A$ and $B' \subseteq B$ satisfy $|A'| = |B'| \geq (1 - \varepsilon)n$, every vertex of A' has at least $(p - 2\varepsilon)n$ neigbors in B', and every vertex of B' has at least $(p - 2\varepsilon)n$ neighbors in A'. Let H be the bipartite subgraph of G with vertex set $A' \cup B'$ whose edges are exactly the edges of G with one end in A' and the other end in B'. Then H has at least cn pairwise edge-disjoint perfect matchings.

4. Prove that for every $\alpha > 0$, there exist $c, n_0 > 0$ such that every graph G with $n \geq n_0$ vertices and at least αn^2 edges contains a $\lceil cn \rceil$-regular bipartite graph as a subgraph.