

1. Find an upper bound for $R(5)$.
2. Determine $R(C_4, C_4)$ and $R_3(C_4)$ if possible.
3. Find $\gamma(K_{13})$ (the genus of K_{13}).
4. Prove that if the orientable genus of a graph G is n , then $p - q + f = 2 - 2n$ where p , q and f are the number of vertices, edges and faces respectively.
5. Let $cr(G)$ denote the crossing number of G . Estimate $cr(K_{11,11})$.
6. (Bonus) Find a better upper bound or lower bound for $R(s)$.