

Assignment 1 (submission deadline 27th Aug, 2026)

1. Among any six people, prove that there are either three people who pairwise know one another or three people who pairwise do not know one another.
2. Show that a graph in which every vertex has even degree has no cut-edge.
3. Let G be a connected graph with exactly two odd-degree vertices u and v . Prove that every cut-edge of G separates u and v .
4. Find the maximum possible number of edges in a simple bipartite graph on n vertices.
5. Suppose G is a graph such that $G - v$ is bipartite for every vertex $v \in V(G)$. Prove that either G is bipartite or G is an odd cycle.