1. Show that the complement of a bipartite graph need not be bipartite.
2. Suppose N(n,k) is the number of non-isomorphic simple graph with n vertices and e edges. Find N(4,3).
3. Using techniques from graph theory show that

    1+2+...+n=n(n+1)/2.

4. Show that two simple graphs are isomorphic if & only if their complements are isomorphic.
5. Show that if a graph is disconnected its complement is connected.
6. A connected graph is said to be **minimally connected** if removal of any one edge from it disconnects the graph. Prove that a graph is a tree if & only if it is minimally connected.
7. Given a graph G its **line graph** L(G) is a graph such that
    a. for each edge in G there is a vertex in L(G).
    b. two vertices in L(G) are adjacent if & only if their corresponding edges share a common endpoint in G.

    Show that if G is a Euler graph then L(G) is an Euler graph.