1. Prove that if u, v are the only vertices of odd degree in a graph G, then there is a path from u to v in G.

2. Let $G = (V, E)$ be a graph with minimum degree at least three. Show that it contains a cycle of even length. (Hint: Consider a longest path).

3. Prove that if $T_1, T_2, \ldots, T_k$ are pair-wise intersecting sub-trees of a tree T, then T has a vertex common to $T_1, T_2, \ldots, T_k$. (Hint: use induction on k).