

Recommended Problems 4

- 4.1 In a league with two divisions of 13 teams each, determine whether it is possible to schedule a season with each team playing nine games against teams within its division and four games against teams in the other division.
- 4.2 Let G be a graph with at least two vertices. Prove or disprove:
- Deleting a vertex of degree $\Delta(G)$ cannot increase the average degree.
 - Deleting a vertex of degree $\delta(G)$ cannot reduce the average degree.
- 4.3 Let V be the set of binary k -tuples. Define a simple graph Q_k^1 with vertex set V by putting $u \leftrightarrow v$ iff u and v agree in exactly one coordinate. Prove that Q_k^1 is isomorphic to the hypercube Q_k if and only if k is even.
- 4.4 Define $d = (d_1, \dots, d_{2k})$ by $d_{2i} = d_{2i-1} = i$ for $1 \leq i \leq k$. Prove that d is graphic.
(Hint: Do not use the characterization from class.)