

Problem Set 3

Due Date: June 23, 2017

1. Prove that the number of spanning trees in K_n , the complete graph on n vertices, is n^{n-2} .
2. Let $G_1 = (V, E_1)$ and $G_2 = (V, E_2)$ be two edge-disjoint graphs on the same vertex set. Let $G = (V, E_1 \cup E_2)$.

- (a) Prove that the algebraic connectivity of the two graphs is superadditive; that is,

$$\lambda_2(L_{G_1}) + \lambda_2(L_{G_2}) \leq \lambda_2(L_G).$$

- (b) For any graph G , let H be a spanning subgraph of G . Infer that

$$\lambda_2(L_H) \leq \lambda_2(L_G).$$