

Problem 1 Warm-up questions:

(a) C_{12} is k -regular. What is k ?

Every vertex of C_{12} has degree 2, so $k = 2$.

(b) Select a vertex $v \in K_{12}$. What is $|N(v)|$?

Every vertex of K_{12} is adjacent to all other 11 vertices, so $|N(v)| = 11$.

(c) Select a vertex $v \in P_{12}$. What is the largest possible size for $|N(v)|$?

A vertex $v \in P_{12}$ is adjacent to at most 2 other vertices.

Problem 2 Prove that if there is a unique (exactly one) path between any two vertices of a graph T , then T is connected and every edge in T is a bridge.

See the proof of Theorem 11.7 in the lecture notes!

Problem 3 Prove that if a graph T is connected and every edge in T is a bridge, then T is a tree.

See the proof of Theorem 11.7 in the lecture notes!