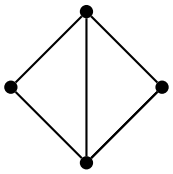
Graph Theory, Spring 2016, Homework 5

1. Suppose G is a graph with no cycles of odd length and no loops. Show that every circuit in G must have even length.

2. Suppose G is a graph with no cycles of odd length and no loops. Let $v, w \in V_G$. Show that either every (v, w)-walk has odd length or every (v, w)-walk has even length.

3. Calculate the chromatic polynomial $\chi_G(x)$ of the graph shown below:



4. Let G be a 5-regular graph, and suppose that G has two Hamiltonian cycles C_1, C_2 which are edge disjoint. Show that G is 5-colorable.