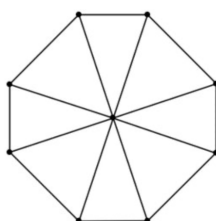


Practice Midterm 4

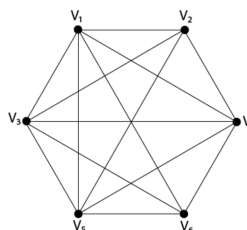
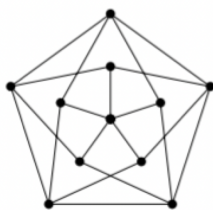
Problem 1 Find the chromatic polynomial of a tree with n vertices.

Problem 2 Find the chromatic number and the chromatic polynomial of the 9-vertex wheel graph:



Problem 3

(1) For each of the two graphs below, determine if it is planar? Justify your answer.



(2) Show that the Petersen graph is not planar.

Problem 4 Prove that if G is a simple connected planar graph, then the inequality $|E(G)| \leq 3|V(G)| - 6$ holds.

Problem 5 Prove that in a polytope, there are two vertices having the same number of adjacent vertices.