Math 335 Midterm 1

Name: _____

1. State the definition of

    a. a graph

    b. a tree

    c. isomorphic graphs G_1 and G_2

    d. a proper r-coloring of G

    e. a cycle of length k in a graph G

2. Why must $n = 4k$ or $n = 4k + 1$ for some integer k in order for a self-complementary graph on n vertices to exist?

3. Let T be a tree. Since $\chi(T) \leq 2$ we can properly color T with colors green and gold. Show that if there are at least as many green vertices as gold, then a green leaf exists.

4. Find the chromatic polynomial $P_G(x)$ if G is the house graph:

5. Let G be the line graph for the complete bipartite graph $K_{2,3}$. Draw G and find $\chi(G)$.