Math 232, Discrete Mathematics II, Winter 2023, Professor Arkady Berenstein

Midterm 2 will be based on sections 10.8, 11.1-11.4.

PRACTICE PROBLEMS FOR MIDTERM 2

1. Find the chromatic number of the given graph.

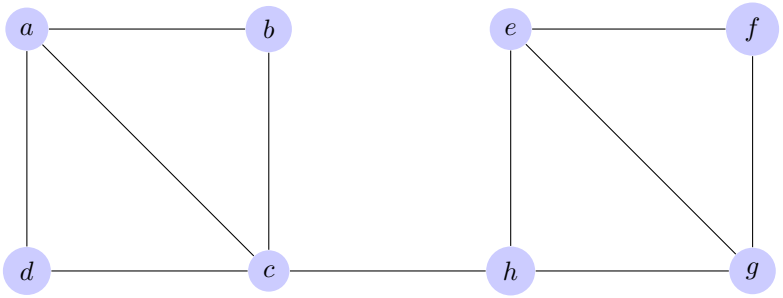
2. What is the chromatic number of a W_n?

3. Let $G = (V, E)$ be a finite graph.
(a) Assume that $|V| = |E| + 1$ and that G is connected. Prove G is a tree.
(b) Assume that $|V| = |E| + 1$. Find an example that G is not a tree.

4. Prove that a finite graph $G = (V, E)$ in which each vertex has degree at least 2 contains a cycle.

5. A connected graph $G = (V, E)$ has 50 edges. What is the maximal value of $|V|$?

6. Consider the graph G below.



(a) Determine the number of spanning trees of G.
(b) Determine the number of nonisomorphic spanning trees of G.

7. Write the expression $(x-1)(x^5+x^4+x^3+x^2+x+1)-(x^6-1)$ in Polish notation, using a rooted tree.

8. (a) Find a rooted tree corresponding the algebraic expression

$$\frac{(3-x)y^4}{z^3/7+3t^2}.$$

(b) Find a preorder traversal.
(c) Find a postorder traversal.
(d) Find an inorder traversal.