MATH 232 Discrete Math

Homework LAST!!!!!!

Basic Information

Make sure you understand MHC honor code and have carefully read and understood the additional information on the class syllabus and the grading rubric. I am happy to discuss any questions or concerns you have!

You are always welcome to ask me for small hints or suggestions on problems.

Problems

Wednesday Problems HW11 (Due: Tuesday, December 9 at 5 PM)
I will start grading this at 7 AM on December 11.

Be sure you completely justify your answer using properties or results from class. An answer without justification will earn 0 points.

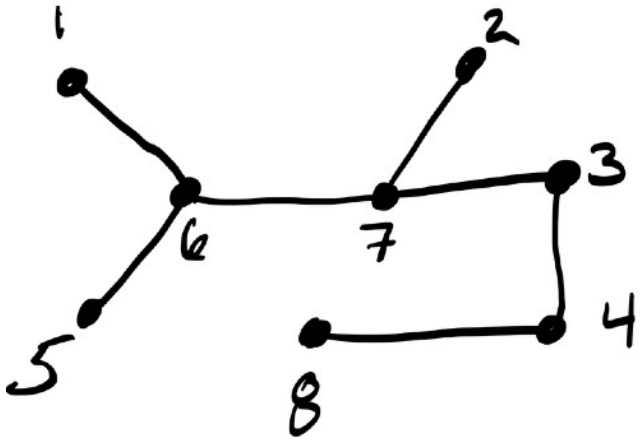
1. (a) Determine the Prüfer code of the tree on the next page.
   (b) Draw the tree that corresponds to the Prüfer code $(4, 4, 4, 2, 1)$.

2. Count the number of labeled trees with11 vertices where all of the following hold:
   - $\deg(5) = 4$
   - $\deg(1) = \deg(7) = 3$
   - $\deg(4) = \deg(8) = 2$
   - all the other vertices are leaves.

   Explain your answer in complete sentences using counting technique(s) from the class.

3. Let T be a tree such that every vertex adjacent to a leaf has degree at least 3. Prove that some pair of leaves in T has a common neighbor (in other words, both leaves are adjacent to the same vertex). **Hint:** One way to prove this is to consider the longest path through the tree.

4. Prove that any tree of order n contains a subtree (a subgraph which is also a tree) of order m for every $m \leq n$. **Hint:** This is a good problem to use induction on to formally write it up.



Tree for problem 1(a).