

There are 20 problems, each worth 10 points on 8 Pages

Circle your answers.

Math 574 Final Exam 1987

Name _____

- ① How many words of length 5 can be made from the alphabet $\{a, b, c\}$?
- ② How many 6 element subsets does a 10 element set have?
- ③ (a) Suppose G is a tree with n vertices and e edges. Give a formula which relates n and e .
- (b) Give an example of a graph which satisfies the formula in (a) but is not a tree.
- ④ Solve the recurrence relation $a_n = a_{n-2}$, $a_0 = 4$, $a_1 = 6$.
- ⑤ What is the chromatic polynomial $P(G, x)$ of the following graph?
- ⑥ Draw a graph with chromatic polynomial equal to $P(G, x) = x^4 (x-1)^3 (x-2)^3 (x-3)^2 (x-4)$
- ⑦ (a) In a graph with 16 edges, what is the minimum possible number of vertices?
- (b) In a connected graph with 16 edges, what is the maximum possible number of vertices?