

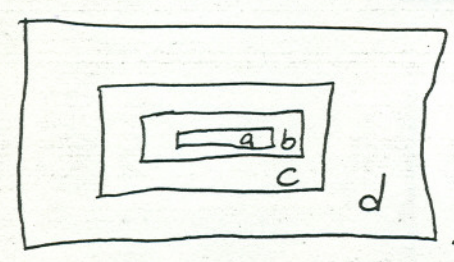
There are 10 problems, each worth 10 points. There are 6 pages.

Justify your answers. If  $G$  is a graph, then

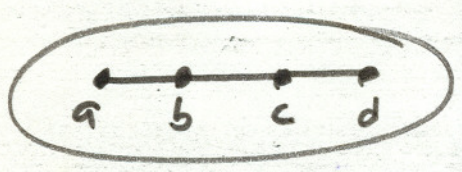
$\chi(G)$  is the chromatic number of  $G$  and  $P(G, x)$  is the chromatic polynomial of  $G$ .

Math 574 Exam 3 1987

① Consider the map



① Draw the Graph  $G$  which represents this map.



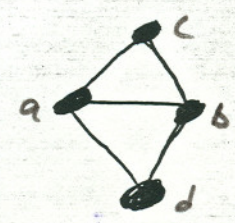
② What is  $\chi(G)$ ?

$\chi = 2$

color a, c red b, d green  $\therefore \chi \leq 2$   
but a & b need diff colors  $\therefore \chi \geq 2$

② Find  $P(G, x)$  for the Graph

$P = x(x-1)(x-2)^2$



x choices for a  
(x-1) " " b  
(x-2) " " c  
(x-2) " " d