MAT 375-1

HOMEWORK ASG. #4   HAND IN TUESDAY, SEP. 27

1. Find the chromatic number of the graphs indicated below. Give a careful argument that i) shows how to color it, and ii) shows that fewer colors will not suffice.
    a) the graph in Problem #4d on page 64,
    b) the graph in Problem #4i on page 65,
    c) the graph in Problem #4m on page 65,
    d) the graph in Problem #4o on page 65.

2. Exercise Set 2.3 # 2 a (Read carefully—we want a minimal <u>edge</u> coloring.)

3. Exercise Set 2.3 # 12 a, b

4. Prove these facts about an *m*-ary tree with *n* vertices, *i* internal vertices, and *l* leaves. You may use the facts that $n = mi + 1$ and $n = l + i$:
    a) $l = (m-1)i + 1$
    b) $n = \dfrac{ml - 1}{m - 1}$
    c) $l = \dfrac{(m-1)n + 1}{m}$
    (For each of the parts of this problem, do <u>not</u> make the mistake of <u>starting</u> with what you want to prove. You start with what is known, manipulate it cleverly, and deduce what is to be proved.)

5. Exercise Set 3.1 #16 (and, of course, explain your reasoning).