Written Assignment # 5

Math 38

Due: Wednesday 13, 2005

Read Section 1.2 and 1.3

1. Illustrate Proposition 1.2.27 with the graphs in Exercise 1.1.21.
2. What is the proof technique used to prove Proposition 1.2.28?
3. In the proof of Theorem 1.2.33, how is it proved that k trails suffice? Give an example to illustrate how this works.
4. What is the order of a graph? What is the size of a graph? What is the order and size of the Petersen graph?
5. Why couldn't we have an odd number of vertices of odd degree in a graph G?
6. Draw a 4-regular simple graph of order 8.
7. What technique is used to show that the Petersen graph has 10 6-cycles?
8. What is an extremal problem? Give an example of an extremal problem.
9. Give 3 examples of a function that you could define on graphs that give you a numerical value.
10. What two things do you have to show if you want to show that β is maximum value for a function on graphs $f(G)$?
11. What does $G + H$ mean when G and H are graphs? Give an example.
12. What does it mean for a graph to be H-free? Give an example of a simple graph with 10 vertices that is triangle (C_3)-free. Is the Petersen graph claw-free (claw = $K_{1,3}$).