

WRITTEN ASSIGNMENT # 1

MATH 38

The purpose of this assignment is to help you in reading your book. The questions asked will be the main concepts that I expect you to know by the next class period. The main difficulty that you will experience at first in graph theory is the amount of vocabulary (it will feel like learning a foreign language) that you need to learn just to be able to understand the problems. But you will also find that the problems are really fun!

1. Why couldn't we use just a vertex and an edge set in the definition of a graph? That is, why do we need a relation also?
2. What is the difference between a "loop" and a "cycle"?
3. Is it possible to draw a simple graph with 7 vertices that contains a clique of size 4 and an independent set of size 4? Is it possible to have a clique and independent set both of size 4 in a simple graph with 6 vertices?
4. Is it true that every simple graph with 5 edges contains a clique or an independent set of size 3? If it is not true give a counter-example if it is true give an explanation.
5. What is an application of bipartite graphs?
6. What is an application of coloring vertices in a graph?
7. Is it true that if G is connected then \bar{G} , its complement, is disconnected? Find a counter-example if this statement is false or give an explanation if it is true.
8. What is the definition of a connected graph? Give an example of a connected and a disconnected graph.