

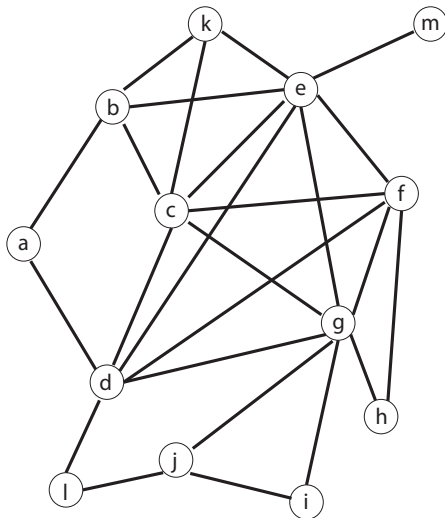
Math 135: Discrete Mathematics, Fall 2010

Homework 10

Due *in class* on Dec. 6, 2010

1. Answer the following questions - and be sure to explain your answers.
 - (a) How many different ways are there to choose a dozen donuts from the 21 varieties at a donut shop?
 - (b) How many different combinations of pennies, nickels, dimes, quarters, and half dollars can a piggy bank have which contains 20 coins?
 - (c) How many solutions are there to the equation $x_1 + x_2 + x_3 + x_4 = 98$, where each x_i is an integer ≥ 1 ?

2. Consider the following graph:



- (a) What is the size of the largest independent set?
 - (b) What is the size of the largest clique?
 - (c) Does this graph have an Eulerian circuit? Justify your answer.

3. Prove that a vertex c in a graph G is a cut vertex if and only there are vertices u and v (both different from c) such that every path between u and v passes through c .

4. Prove or disprove the following: A graph is connected if and only if some vertex is connected to every other vertex.