

Name: \_\_\_\_\_

## Math 428, Summer 2017

### Quiz 2 – July 17

(1) Are the following sequences graphical? If so, construct a graph with the degree sequence; if not, briefly explain why.

a. 4,4,4,2,2,2,1,1

b. 4,4,3,2,2,2,1,1

(2) Show that a graph  $G$  is regular if and only if its complement  $G$  is regular.

## Analysis of the Quiz

This is an example quiz from my Graph Theory course; the purpose of these quizzes is to serve as a way of gauging my students' understanding of the material, as well as to motivate them to study the material as we learned about it in lecture (as opposed to only in anticipation of a test), so they are deliberately straightforward. For this quiz, we had spent the past two lectures talking about topics related to the degree of a vertex, including degree sequences and the definition of a regular graph, so this quiz focused on those topics.

The first question tests the students' ability to apply and understand the algorithm from lecture for testing if a sequence is graphical; this algorithm also constructs an example graph with the given degree sequence. For part b of that question, they can quickly assert that the sequence is not graphical because the sum of the degrees is odd, rewarding careful observation and a willingness to not default to the algorithm.

The second question is designed to see if they know what a regular graph and a graph complement are, but also, more importantly, it lets students become more comfortable with the idea of proof-like arguments. A knowledge of proofs is not a prerequisite for the course, but a lot of the material involves working with them; consequentially, it is important that the students which aren't familiar with proofs are introduced to the sort of reasoning that goes into them. This question allows students to become familiar with this way of thinking on a relatively simple problem.