

Math 2001: Homework W3

Due October 16, 2009

The following assignment will be graded with an emphasis on clarity of exposition. You should write in complete sentences, be as precise as possible, and be mathematically correct (both in content and format). Be sure to include a title, a short introduction to the topic, and to define all the relevant mathematical terms. The assignment should be **typed**.

Explain why finding the number of shortest paths is the same as finding the number of k -element subsets of a set. You should include

- (a) An introduction
- (b) What do you mean by “shortest path?”
- (c) What do you mean by “ k -element subset?”
- (d) A precise statement of your main theorem.
- (e) A careful proof of your main theorem (probably a correspondence between shortest paths and subsets). Examples certainly help here, but you should try to state things generally as well.