MA1971

Name:

Quiz 6

D Term, 2015

Show all work needed to reach your answers.

1. (10 points) Please explain why a vertex of degree four in a supposed minimal 5-colorable graph in fact forces the graph to be 4 colorable. That is, why can we necessarily change the color of one of the four adjacent vertices to free-up a color of the vertex of degree four?

2. (10 points) Consider a planar graph with 16 vertices all of which have degree 4. How many regions will this graph divide the plane into (remember that the outer region counts as a region)? Please justify (i.e., prove) your answer.