



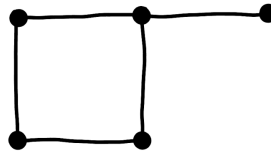
Exam 3

Combinatorics, Dave Bayer, April 26 - May 1, 2023

Please show all of your work. You will be graded for both your answers and your explanations.

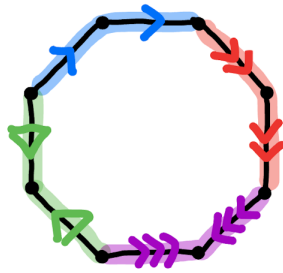
This test is open-book. You may use any resource such as my course materials, textbooks, or *The On-Line Encyclopedia of integer Sequences*. You may not receive help from another person.

[1] What is the chromatic polynomial of the following graph?



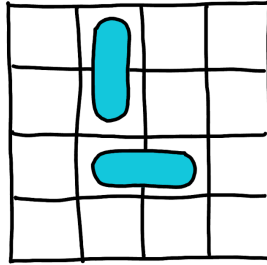


[2] Which topological surface is represented by the following gluing diagram?



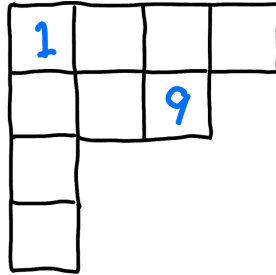


[3] How many ways can we place a pair of 1×2 markers on a 4×4 grid?





[4] How many ways can the following diagram be filled in to complete a Young tableau?





[5] How many ways can we choose a pair of edges of a dodecahedron, up to rotational symmetry?

