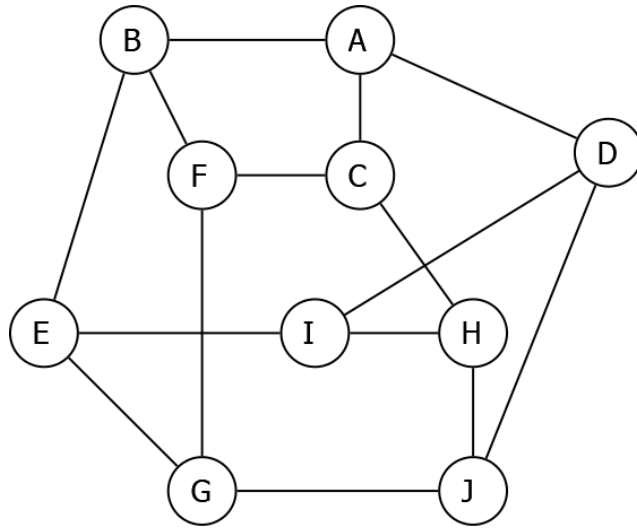


Math 154 Exam 2

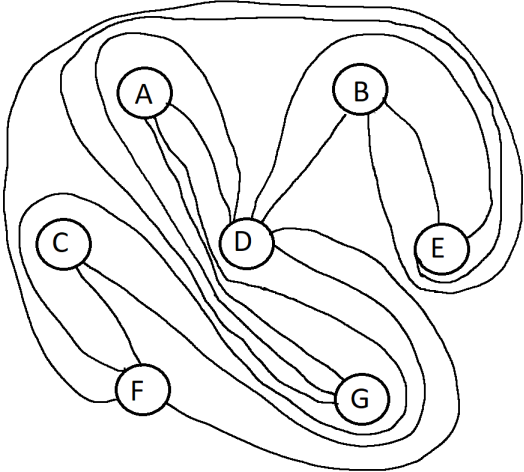
Spring 2020

Question 1 (Polyhedron Faces, 25 points). *Suppose that P is a polyhedron with five faces meeting at every vertex, each face being either a triangle or a square. If P has 72 vertices, how many faces of each type does it have?*

Question 2 (Coloring, 25 points). *Give a 3-coloring of the graph below:*



Question 3 (Straight Line Embedding, 25 points). *Provide a straight line planar embedding of the graph below:*



Question 4 (Chromatic Numbers and Subgraphs, 25 points). *Let G be a finite graph with a complete subgraph H . Suppose that $G - H$ is split into connected components E and F . Prove that $\chi(G) = \max(\chi(H \cup E), \chi(H \cup F))$, where $H \cup E$ and $H \cup F$ denote the induced subgraphs on the relevant sets of vertices.*

Question 5 (Timing). *If you have permission to take the exam at a non-standard time or have OSD accommodations for extended time, please list the time that you started the exam and the time that the exam should be due. Please list both in pacific time.*