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AMS301
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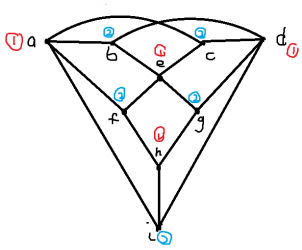
Homework 4a

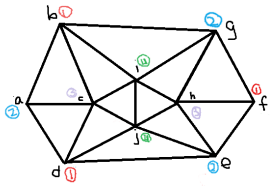
Section 2.3 Question 1 Part K

The chromatic color for the graph is 2. Every edge between two vertices is a K_2 subgraph. Therefore there must be at least two colors to prevent adjacent nodes from sharing a color.



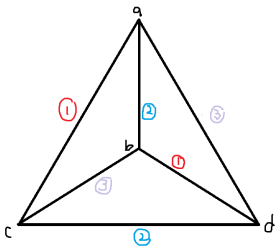
Section 2.3 Question 1 Part O

The chromatic color for the graph is 4. The largest complete subgraph of the graph is K_3, so we can try and build 3-color the graph. Start coloring the triangle $b - a - c$ with colors $1 - 2 - 3$ respectively. Vertex d is adjacent to both a and c, so it must be the same color as b. Vertex i is adjacent to b and c while vertex j is adjacent to c and d, so they must both be colored the same as vertex a. However, this is not possible, since vertices i and j are connected to each other. The graph therefore can not be three colored. A four colored configuration si possible.



Section 2.3 Question 2 Part A

All vertices have a degree of 3, meaning the graph's edges cannot be any less than three colored.



Section 2.3 Question 2 Part B

All vertices have a degree of 3, meaning the graph's edges cannot be any less than three colored.