MATH 170: HOMEWORK 7

Graded for accuracy: 1,2.
Graded for completion:
Instructions: Problems that are graded for accuracy must be correct to get points. Problems that are graded for completion must show some trying effort.
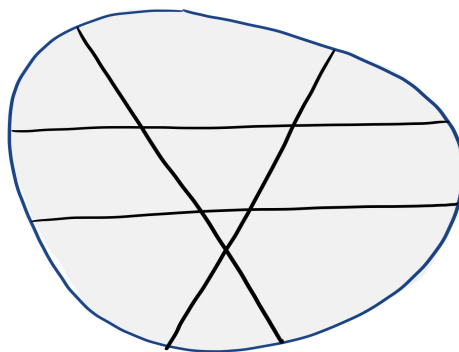
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1. (a) Draw the following graph $G = (V, E)$ where
    $$V = \{a, b, c, d, e, f, g\}$$
    and
    $$E = \{ab, aa, ad, af, be, eb, de, ed, ef, fa, fd, ff, cg\}\,.$$
    (b) Is G connected?
    (c) If it is not connected, how can you fix it so that it is connected? Write down using mathematical symbols as in part (a) to represent the new graph you found.
    (d) Is there an Eulerian path through your graph?
    (e) Is there an Eulerian cycle through your graph?

2. Island Linear has 10 countries on it, the map looks like this:

    (a) Draw the graph dual to this map.
    (b) Can you color this graph in two colors such that vertices of the same color never share an edge?
    (c) What is the chromatic number of this graph?