Discrete Mathematics, 2016 Fall - Worksheet 24

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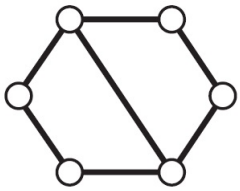
In all of the above problems explain your answer in full English sentences.

1. For which values of n is the complete graph K_n Eulerian?
2. Let G be a connected graph that is not Eulerian. Prove that it is possible to add a single vertex to G, together with some edges from this new vertex to some old vertices such that the new graph is Eulerian.
3. Let G be the graph in the following figure. Please find $\chi(G)$.

G



4. Let G be a graph and let v be a vertex of G. Prove that

$$\chi(G - v) \leq \chi(G) \leq \chi(G - v) + 1$$

5. Let $G = K_{n,m}$. Determine $|V(G)|$ and $|E(G)|$.
6. Let G be a graph with n vertices. Prove that $\chi(G)\chi(\bar{G}) \geq n$.